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An Empirical Analysis of Balance of Payment in Ghana using the Monetary Approach

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Abstract
A major challenge to the Ghanaian economy is the persistence disequilibrium in the balance of payments. This is a general economic phenomenon in most developing countries. Using an annual data set from 1980-2010. This study analyzes the balance of payments for Ghana using a monetary approach with the aid of econometric models. The study shows that the balance of payment disequilibrium in Ghana is not influence only by monetary variables. Out of the four monetary independent variables three were found to be significant. The results also show that domestic credit, GDP growth, and interest rate are found to be significant. Domestic credit and interest rate are negatively related to net foreign assets while GDP growth is positively related. Inflation however is insignificantly related to net foreign assets. However, government expenditure and public debt may influence the balance of payment in Ghana. The implication for policy is that to correct the disequilibrium in balance of payment, government should give equal attention to other policy levels instead of relying solely on monetary tools to attain stability in the country's balance of payments account.
Key words: balance of payment, interest rate, inflation, domestic credit, Ghana

1. Introduction

The global financial crisis and the subsequent slump in economic growth has lead to greater emphasis been placed upon the need to maintain adequate supply of money in the economy in the face of continue balance of payments deficits. But many developing countries have a deficit balance of payment account and face many troubles in monetary actions which present pressing challenges for monetary authorities (Umer 2010). The aim of many developing countries is to stabilize the balance of payment account which strengthens the macroeconomics policies.

Among developing countries there is a prevalence of persistent current account deficit which is a major cause of concern because, maintaining a healthy and stable balance of payments, promoting trade and hence drives rapid economic growth. Therefore, the management and sustenance of balance of payments equilibrium is of great importance for developing countries to pursue. Several factors account for the persistent balance of payments disequilibrium including: poor export performance, huge service account deficits, external debt amortization, low inflow of foreign direct investment, misappropriation of external funding support, excessive domestic monetary and credit expansion, large fiscal deficits, price distortions and a deterioration in the terms of trade (Ogiogio 1996; Obioma 1998).

Ghana has been in balance of payment deficit since the mid-1970s, arising mainly from the persistent deterioration in the trade account, which has provoked many questions on potential causes of this imbalance. For instance Ghana's current account deteriorated from a surplus of 0.7% of GDP in 1980, to a deficit of 3.8% of GDP in 1990 and further deteriorated to a deficit of 24.7% of GDP in 2008. Despite efforts under the economic recovery programme to stabilize the country's balance of payments, Ghana's current account remained in deficit throughout the 1980s and into the early 1990s. Both trade and service deficits continued into the 1990s, given the country's dependence on concessional inflows and IMF funding (State of the Ghanaian economy report 2009). The current account deficit fell by US$91 million in 1986 from US$134 million in 1985, but it rose again by US$54 million in 1987. After another recovery in 1988, it was back at US$99 million in 1989 and widened to US$228 million in 1990.

The Centre for Economic Policy Analysis (CEPA) in 2006 reported that Ghana's overall balance of payment has deteriorated sharply in recent years, dropping into a huge deficit of US$940.8 million which was estimated at 5.8% of GDP in 2008.Many academic scholars and politicians are of the view that if efforts are not made to deal with the

country's deficit, the country will be sliding down the dangerous path of economic failure of others countries like Greece. Also there is convincing evidence that the Monetary Approach to Balance of Payment (MABP) in fact is an important concept in literature and an unresolved issue. Lachman (1975) and Dhliwayo (1996) have found evidence of the MABP while others including Watson (1990) did not found any support in favour of the MABP. It is therefore crucial to undertake this study to find out whether excess money supply plays a significant role in the balance of payment disequilibrium in Ghana and also to identify determinants of balance of payment adjustment in Ghana.

2. Literature Review

The Monetary approach to balance of payment (MABP) which regards the balance of payments as a monetary phenomenon, expresses the relationship between a country's balance of payments and its money supply (Chacholiades 1990). MABP shows that the overall balance of payments (measured by international reserves) is influenced by imbalances prevailing in the money market.

Dhliwayo (1996) argued that under a system of fixed exchange rates excess money supply induces increase expenditure, hence increased domestic demand for foreign goods and services. The high domestic demand needs to be financed by running down foreign exchange reserves, thereby worsening the balance of payments. He further explained that the outflow of foreign exchange reserves reduces money supply until it is equal to money demand, thereby restoring monetary equilibrium and halting an outflow of foreign exchange reserves. Therefore an excess demand for money leads to an opposite adjustment, which in turn induces foreign exchange reserves inflow, and hence causes a BOP surplus. This triggers domestic monetary expansion and eventually a restored balance of payments equilibrium position.

The formal MABP model includes money supply and money demand functions and an equilibrium condition. The model consists of the following set of equations: Ms = (R+D) …… (1), Md = f(Y, P, I) ……(2), M_s=M=M_d ……(3)

Where Ms =Money supply, M_d= Money demand, R= foreign reserve (NFA), D= domestic credit (NDA), Y= real domestic income, P= price level, I=nominal interest rate, M= money market equilibrium. Dhliwayo explained that equation 1 shows that money supply is determined by the availability of international reserves and the level of domestic credit created by the country's monetary reserves, while equation 2 sets out the real demand for money as a function of real income, the inflation rate and the interest rate. However, the monetary theory states that there is a positive relationship between money demand and income ($\partial M^d / \partial Y > 0$) and, money demand and the price level ($\partial M^d / \partial P > 0$), and a negative relationship between money held and the interest rate ($\partial M^d / \partial I < 0$). By combining equations 1, 2 and 3, and making reserves as the dependent variable, the reserve flow equation can be written as follows, with the variables expressed in percentage changes: $\Delta R = \Delta[F(Y,P,I)] - \Delta D$……4

Equation 4 is the fundamental monetary approach to balance of payments equation. It shows that foreign reserves (BOP) represent the deviation in growth of money demand from the growth of domestic credit with the monetary consequences of the balance of payments bringing the money market into equilibrium. The international reserves equalize the changes in domestic credit and the coefficient of ΔD is recognized as an offset coefficient. It shows the extent to which changes in domestic credit are offset by changes in international reserves, and the coefficient assumes a negative sign for MABP in the reserve flow equation (Dhliwayo 1996).

Adamu & Itsede (2009) categories disequilibrium in the balance of payments to be either temporary or fundamental. Temporary disequilibrium the authors noted is caused by random variations in trade, seasonal fluctuations, and the effects of unfavourable weather on agricultural production, which tend to be self-equilibrating within a short time. But fundamental disequilibrium is a chronic deficit or surplus, which is a persistent and prolonged payments imbalance, and thus requires policy measures to correct (Hallwood & MacDonald 1996; Adamu & Itsede 2009).

Right through the years different adjustment mechanisms to balance of payments disequilibria have been developed, namely the monetary approach, the elasticity's approach, and the absorption approach (Du Plessis *et al.* 1998). According to Salvatore (1998) and Fleermuys (2005), the monetary approach to the balance of payments balance of payments is a "*monetary phenomenon*". They further argued that the monetary approach focuses on how the demand and supply of money affect the balance of payments and the exchange rate. Their argument is based on the view that since the exchange rate is the price of currency, movement in this rate is basically a monetary phenomenon, and can be explained by concentrating on the market for money.

The MABP flows from the classical price-specie-flow mechanism, and is based on the notion that money plays an important role in causing a disturbance in the balance of payments account as well as serving as an adjustment mechanism to correct the disturbance (Salvatore 1998). Du Plessis *et al.* (1998) are of the opinion that the MABP regards money as a stock, and argues that money stock can be changed through international reserve flows. They further state that a fixed exchange rate system could work without having to resort to devaluation, provided a country has a sound monetary policy; thus, devaluation will only occur as a result of a failure of monetary policy. This argument stems from the fact that disequilibrium in the balance of payments is a temporary situation that will be corrected if the money market is in equilibrium.

2.1 The Balance of payment as a monetary experience

David Hume price-specie-flow mechanism depicts MABP which was against the general conception about the balance of payment that is deviation from imports to exports. The association between a country's balance of payment and its money supply is expressed by the MABP (Chacholiades 1990). Moreover, if there is surplus and deficit in the current account balance then money market fails. If money supply is greater than money demand then it creates deficits and if opposite condition lies then it generates surplus (Howard & Mamingi 2002). The main consideration of MABP is imbalance in the current account balance. If the consideration is price level then MABP represents the actual value of assets, money and foreign debt. Moreover, relative prices have no direct effect on the balance of payment.

The following equations represent the money supply and money demand and show the equilibrium condition. $M_s = (R + D)$…….. (1), $M_d = F(Y, P, I)$……. (2), $M_s = Md$……. (3) Where, Ms = money supply, R = foreign reserves (NFA), D = domestic credit (NDA), Md = money demand, Y = real domestic income, P = price level, I = nominal interest rate, and, M = equilibrium of money market.

If the change in money demand with respect to change in real income and change of money demand with respect to change of price level are greater than zero then monetary theory satisfies. Moreover, if the changes in money demand with respect to change in interest rate is less than one then people demand for money will increase with the decrease in interest rate and they will start to invest in different businesses. The reserve flow equation is as follows: $\Delta R = \Delta[F(Y, P, I)] - \Delta D$…….. (4) Whereas, equation 4 explains three equations, foreign reserves is taken as a dependent variable representing the deviation in growth of money demand from the growth of domestic credit and money market is in balance at the same time. While, the money market is in equilibrium then change in domestic credit shows similar change in international reserves but in opposite direction. The international reserves equalize the changes in domestic credit that's why coefficient of $-\Delta D$ is recognized as an offset coefficient. This coefficient shows negative sign for MABP in the reserve flow equation (Dhliwayo 1996).

Enormous studies have been conducted to test legitimacy of MABP. Empirically, it is argued that MABP justifies in open small economies with fixed exchange rates. Mostly studies were conducted by emphasizing on the 'reserve-flow equation'. In which, explained variable is the rate of change in reserves where explanatory variables are different for different researches. It would be rate of interest, domestic income and prices, government expenditure, money multiplier, money stock, the exchange rate, and demand for nominal and real money balances. Coppin (1994) examined that the "degree of openness of an economy" and expansionary fiscal policy are the essential factors in shaping foreign reserves. Moreover, his arguments were in favour of MABP in the case of Barbados. A similar conclusion was also reached by Leon (1988) who justified MABP in the case of Jamaica. Leon explored the implication of reserve-flow and sterilization equations in Jamaica. However, Watson (1990) investigated the model of Trinidad and Tobago's balance of payments for the period 1965–1985 and examined that all other variables show reliable results except dependent variable 'the change in international reserves' that is against MABP. A similar research was carried out by Jimoh (1990) using Nigeria as a case. His conclusion was that monetary authorities in Nigeria must pay adequate attention to domestic credit creation in an attempt to control balance of payments. Aghevli & Khan (1977) examined MABP in 39 developing countries and found evidence in favour of MABP. Lachman (1975) explored MABP in South Africa and suggested that monetary establishment is responsible to control the money supply for enhancing imports.

3. Methodology

3.1Model specification

According to Koutsoyiannis (1977), the first and most important step the econometrician has to take in attempting the study of any relationship between variables is to express this relationship in mathematical form that is to specify the model with which the economic phenomenon will be explored empirically.

Developing countries under fixed exchange rate system cannot maintain money stock over a long period. In that situation to maintain the balance of payment under fixed exchange rate, there should be increased in domestic price level, and equivalence of money demand with money multiplier (Wilford & Wilford 1978). Moreover, domestic policies are not to be affected by domestic conditions because of its controls in international market under fixed exchange rate. Floating exchange rate system is the case through which domestic policies can have effect in controlling inflation. MABP suggests that too much creation of credit could generate the situation where reserves might be lost. Particularly, through increasing demand of money by swift increase in growth of the economy, a balance of payment could be stabilized.

The explanatory variables include the total domestic credit, or its components, GDP growth, inflation, and interest rate. Explicitly, the equations for estimation, and the expected signs of the coefficients are presented below: Log (NFA) = α +β_1 Log (domestic credit) + $\beta_2$inflation +β_3GDPgrowth + β_4 Interest rate +μ Where NFA = net foreign asset, GDP growth= Gross domestic product growth, μ = Stochastic error term

3.2 Estimation procedure

The ordinary least squares single equation technique is the estimation procedure chosen for this study. It will be used for estimating the equations already specified. As a justification for this method, Maddala (1977) identified that ordinary lest squares is more robust against specification errors that many of simultaneous equation methods and also that predictions from equation estimated by ordinary least squares often compare favourably with those obtained from equations estimated by the simultaneous equation method. Among other reasons is the simplicity of its computational procedure in conjunction with optimal properties of the estimates obtained and these properties are linearity, unbiased and minimum variance among a class of unbiased estimators.

Now, for the ordinary least squares method (which depends on the minimization of the sum of squares of the error) to be applied, certain explicit assumptions must be made about the behaviour of non observable error term (Koutsoyiannis 1977).

Assumption 1: (Randomness of Error term), the variable U is a real random variable.

Assumption 2: (Zero mean of error term), the random variable U has a zero mean value for each independent variable.

Assumption 3: (Homoscedasticity), the variance of each error term is the same for all the independent variables.

Assumption 4: (Normality of error term), the value of each error term is normally distributed. **Assumption 5:** (Non autocorrelation or serial independence of the U's), the values of the error term (Corresponding to Xi that is independent variables) are independent from the values of any other Ui (Corresponding to Xi).

Assumption 6: (Independence of Ui and Xi), every error term Ui is independent of the independent variables. Furthermore, the validity of ordinary least squares technique requires the following assumption:

Assumption 7: (No multicollinearity), two or more regressors in a multiple regression are not sufficiently corrected E (Xs Xt) = 0

A priori assumption and statement of hypotheses, the study is guided by the following hypotheses:

H_1: An increase in the real interest rate decreases the demand for liquidity, thus creating an excess supply for money, resulting in reserve outflows. The study expects a negative coefficient for this variable.

H_2: Holding all else constant, an increase in inflation in an economy depresses the demand for real balances, creating excess supply of money, thus causing reserve outflows. The expected coefficient is negatively related to the dependent variable.

H_3: When the monetary authority expands domestic credit faster than needed to meet the increase in demand for nominal balances, the public increases expenditures over income, thereby creating a balance of payments deficit resulting in foreign reserves decline. The resultant coefficient should have a negative sign

H_4: The effect of GDP growth is somehow ambiguous. This makes it difficult to state the expected sign or the nature of relationship between GDP growth and net foreign asset.

3.3 Sources of data

This study used Secondary data. The macroeconomic variables of interest (inflation and interest rate, GDP Growth) were obtained from the World Bank development indicator, and Bank of Ghana database.

3.4 Data Analysis Technique

Annual time-series data on the variables under study covering thirty year period (1980-2010) are used in this study for estimation of functions. The study employs ordinary least squares in the estimation of the coefficients of the parameters. The strength of the coefficients derived from ordinary least squares model was used to establish the relationships between the dependent variable and the independent variables. Various tools such as Durbin Watson were used to test for autocorrelations. Data obtained was analyzed using statistical and econometric software such as E-views and Excel application software.

4. Discussion of results

The result presented in table 1 shows that three variables GDP growth, Domestic credit, and interest rate have statistically significant coefficients. In addition, their signs are as predicted by theory, signifying that in the Ghanaian case GDP growth, domestic credit and interest rate significantly affect net foreign assets. The associated sign of inflation rate is as expected; however, the coefficient of this variable is statistically insignificant.

The fact that GDP growth, domestic credit and interest rate are statistically significant is not conclusive evidence that monetary approach to balance of Payment works in Ghana. The reason for such cautious approach is due to the very low value of the adjusted R-square value of 0.473. This makes the estimated coefficients of the model less robust. The reason for low adjusted R-square value is that there are other variables which have significant impact on net foreign asset, particularly in the case of Ghana that has been overlooked by the study.

The study shows that GDP growth positively affects net foreign assets. The coefficient for this variable is 0.9983 implying that 1% increase in the growth rate of the Ghanaian economy causes 0.9983% increase in net foreign asset, confirming the hypothesis that GDP is an important factor in the determination of domestic reserves. A similar result was obtained by Umer *et al.* (2010) in the case of Pakistan. However in the case of Namibia, Fleermuys (2005) shows that a country's GDP level does not play a significant role in the level of reserves. In all, sustainable economy growth can result in improved net foreign reserves, and significantly reduce balance of payment deficit. In the case of domestic credit the study found a negative or an inverse relationship with net foreign asset. Specifically, 1% increase in domestic credit causes a 6.69% decrease in net foreign asset. The result suggests that excessive creation of credit generate the situation where reserves might be lost. For monetary authorities in Ghana, easy creation of debt through monetary easing might have negative consequence for the nation's reserves, this therefore calls for a discipline and constrain monetary policies. Government should look at its budget deficit, which is mostly financed through the central bank's credit in Ghana. The expansion in the fiscal deficit causes an increase in domestic credit. The finding is consistent with the theory as well as empirical studies such Umer *et al.* (2010) and Fleermuys (2005). Both authors found an inverse relationship between domestic credit and reserves in their respective studies.

The estimated coefficient for interest rate was negative and significant, implying that interest rate is inversely related to reserve. The study shows that 1% change in interest rate decrease reserves by as much as 3.01%. The result for interest rate however, confirms what was found for domestic credit. Lower interest rates improve or encourage excessive borrowing and a consequent boom in domestic credit which in the end leads to a reduction in reserve. It can also be argued that an increase in the real interest rate decreases the demand for liquidity, thus creating an excess supply for money, resulting in reserve outflows.

For inflation the estimated coefficient is consistent with theory but it remains statistically insignificant in the case of Ghana. The study established a negative relationship between price levels of goods and reserves but the coefficient was less robust as the associated t-statistics was estimated to be less than 2. This prevents any conclusion to be reached regarding the nature of the relationship between the two variables.

In the nutshell, the results of this study imply that other policy instruments or measures such as exchange rates, public debt and possibly investor confidence should be explored when trying to achieve balance of payments stability rather than monetary tools only, as predicted by this theory. The study has shown that balance of payments is not solely impacted by monetary factors especially in the case of Ghana. As result issues of imbalances in BOP cannot be resolved only through monetary policies. The researchers can therefore conclude that money supply is not the only correcting mechanism for the disturbance in balance of payments more especially within the context of developing countries.

Table 1: **Results of Ordinary least squares**
Dependent variable: NFA

Independent Variables	Coefficient	Standard Error	T-statistics
Constant	44.74454	8.498402	5.26505
GDP growth	0.99831	0.311263	3.20727
Inflation	-0.033662	0.017078	-1.97110
Domestic credit	-6.690127	2.401649	-2.78570
Interest rate	-3.01245	1.40189	-2.14884
R^2:		0.473089	

5. Findings

The study in the end identified the role excess money supply have on balance of payment disequilibrium. However, the findings show that the balance of payments disequilibrium in Ghana is not solely due to the influence of monetary variables. Over all; domestic credit, interest rate and GDP growth affect balance of payment or the international reserves of Ghana. The variable inflation is found to be statistically insignificant. The study shows that GDP growth positively affects net foreign assets, confirming the hypothesis that GDP is an important factor in the determination of reserves.

In the case of domestic credit the study found a negative or an inverse relationship with net foreign asset. Specifically, 1% increase in domestic credit causes a 6.69% decrease in reserves. The result suggests that excessive creation of credit generate the situation where reserves might be lost. For monetary authorities in Ghana, easy creation of debt through monetary easing might have negative consequence for the nation's reserves, this therefore calls for a discipline and constrain on monetary policies. Government should look at its budget deficit, which is mostly financed through the central bank's credit in Ghana

Interestingly, the estimated coefficient for interest rate was negative and significant. Implying that interest rate is inversely related to reserve. It must be noted that this finding confirms result found for domestic credit. This predicated on the assumption that lower interest rates improve or encourage excessive borrowing and a consequent boom in domestic credit which in turn leads to large imports of goods and services and a consequent reduction in reserves. For inflation the estimated coefficient is consistent with the theory but it remains statistically insignificant in the case of Ghana. The study established a negative relationship between price levels of goods and reserves but the coefficient was less robust as the associated t-statistics was estimated to be less than 2.

6. Conclusion

The research set out to examine the MABP in Ghana using annual data set that covered 1980-2010. Using the augmented Dicker Fuller model, the time series data was tested to establish the stationarity or otherwise of the data. Co-integration analysis which refers to a group of variables that drift together was performed on the variables. It was found that NFA, domestic credit, inflation, interest rate and GDP growth commonly drifting variables making linear relationships between these variables over long period of time thus translating into equilibrium relationships of economic variables. Further examination was by means of ordinary least squares empirical results showing that the balance of payments in Ghana is not wholly a monetary phenomenon. In all three variables GDP growth, interest rate, and domestic credit were found to have a significant impact on net foreign assets. Although the findings generally fulfill predictions and expectations of literature, the result reveals that disequilibrium in the balance of

payment does not entirely comply with the influence of monetary variables. Factors such as government expenditure, strongly affect balance of payment**.**

7. Recommendations

The policy implication for the Ghanaian economy is that, increases in credit creation lead to a continuous loss of reserves. Thus, monetary authorities should pay special attention to domestic credit creation when controlling the country's balance of payments.

Furthermore, it is important that the country achieves sufficient economic growth through money demand to correct the balance of payments deficit. Ghana should also pursue fiscal policies that do not result in large budget deficit. Excessive public debt negatively impact on balance of payment. The expansion in fiscal deficit leads to increase in domestic credit which has been shown to impact negatively on balance of payment`.

For policy makers when looking for policy instruments to correct the disequilibrium in balance of payment, authorities should give equal attention to other policy levels instead of relying solely on monetary tools to attain stability in the country's balance of payments account. For further studies it is recommended that a much larger sample size than the one adopted for this research should be used. In addition other non-monetary variables such as Government expenditure should be included to achieve a comprehensive picture of variables that significantly affect balance of payments.

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NOTES

Table 2: Result of Augmented Dickey-fuller (ADF) Test

Variables	Levels	Difference	Lag	I(D)/Integration order
NFA	(2.3533) 3.6998 2.97626	(3.43088) 3.769597 3.004861**	3	I(1)
DOMESTIC CREDIT	(2.0061) 3.67017 2.96390	(5.85078) 3.67932* 2.96776**	3	I(1)
INTEREST RATE	(1.96861) 3.78803 3.00486	(5.06598) 3.83151* 3.02997**	3	I(1)
GDP GROWTH	(3.10459) 3.67932 2.96776**	(6.18141) 3.67932* 2.96776**	3	I(0)/I(1)
INFLATION	(5.07149) 3.67017* 2.971853**	(6.74094) 3.689194* 2.971853**	3	I(0)/I(1)

*=1% significance and **= 5% significance

Table 3: Results of Granger causality test

Null hypothesis	No. of Lags	F-statistics	P value	Reject/Do not reject hypothesis
Domestic credit does not Granger cause NFA	4	2.42228	0.0043	Reject
NFA does not Granger cause Domestic credit	4	8.651206	0.0045	Reject
GDP growth does not Granger cause NFA	4	3.01233	0.9988	Do not Reject
NFA does not Granger cause GDP growth	4	0.90804	0.0001	Reject
Interest rate does not Granger cause NFA	4	0.0279	0.0008	Reject
NFA does not Granger cause interest rate	4	0.9080	0.7678	Do not Reject
Inflation does not Granger cause NFA	4	0.84918	0.05125	Reject
NFA does not Granger cause inflation	4	1.79696	0.1734	Do not Reject

Table 4: Results of Co integration

Date: 07/03/12 Time: 03:13

Sample (adjusted): 1982 2010

Included observations: 29 after adjustments

Trend assumption: Linear deterministic trend
Series: NFA GDPGROWTH INFLATION DOMESTIC INTEREST RATE

Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.929413	79.55439	69.81889	0.0068
At most 1	0.620159	29.18716	47.85613	0.7594
At most 2	0.320129	10.79512	29.79707	0.9659
At most 3	0.159819	3.463942	15.49471	0.9419
At most 4	0.008142	0.155325	3.841466	0.6935

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

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

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.929413	50.36723	33.87687	0.0003
At most 1	0.620159	18.39204	27.58434	0.4628
At most 2	0.320129	7.331179	21.13162	0.9397
At most 3	0.159819	3.308617	14.26460	0.9241
At most 4	0.008142	0.155325	3.841466	0.6935

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

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