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# **Do Monetary Expansion Hypotheses Hold in the WAMZ?**

**by**

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## **Abstract**

This paper tests test if two of the monetary expansion hypotheses hold in the West African Monetary Zone (WAMZ). The WAMZ consists of The Gambia, Ghana, Guinea, Nigeria, Nigeria and Liberia. The monetary expansion hypotheses tested are the Government-push Hypothesis/Budget Deficit Hypothesis and the Balance of Payment Surplus Hypothesis. The postulation of budget deficit hypothesis is that the size of government budget balance significantly affects monetary expansion. The balance of payments surplus hypothesis conjecture is that monetary expansion emanates from surpluses in balance of payments or changes in international reserve position. The models derived from these hypotheses reflect changes in money supply as a function of changes in government budget balance and changes in international reserves. Autoregressive distributed lag dynamic effects are introduced into the model. Fixed Effects (within), Random Effects Generalised Least Square and Random-effect Maximum Likelihood regressions are the three unbalanced panel data estimation methods employed for annual data of money supply, budget balance and international reserves, spanning averagely over the period of 14 years between 1980 and 2014. The random effect output reveal that the Government-push Hypothesis/Budget Deficit Hypothesis holds while there was no evidence of such for the Balance of Payment Surplus Hypothesis. These results suggest that for the WAMZ as a future monetary union, it is likely that with the effects of past changes in money supply and budget balance, there would be contraction of monetary base whenever budget balance goes up. The implication of this for the monetary union is that conflict of interests (in between actions at both national and union levels) in monetary expansion decision.

## **1. Introduction:**

There are some established variables influencing expansion of monetary aggregates which are hypothesised in several forms. The aim of paper is to test if two of these monetary expansion hypotheses hold in the West African Monetary Zone. The hypotheses to be tested here are the Government-push Hypothesis/Budget Deficit Hypothesis (by Michael Parkin) and the Balance of Payment Surplus Hypothesis (changes in international reserves). The Wage-push Hypothesis and the Import Price-push Hypothesis (by John Hicks and Lord Kahn) are other forms of monetary expansion hypotheses.

The budget deficit hypothesis postulates that the size of government budget balance significantly affects monetary expansion as politicians spend more to entice voters (while keeping tax rates and consequently, tax revenues low) thus making expenditure to grow faster than tax revenue, leading to budget deficit which serves as justification for expansion of money supply by the monetary authority. For this study on the commodity export countries of WAMZ (The Gambia, Ghana, Guinea, Nigeria, Nigeria, Liberia), which experienced commodity windfalls in the past, this study applies changes in budget balance/deficit as an explanatory variable in the reaction function. The balance of payments surplus hypothesis conjecture is that monetary expansion emanates from surpluses in balance of payments or changes in international reserve position.

The test of monetary expansion for the proposed monetary union is essential given the monetary expansion/contraction roles of the proposed common central bank expected to manipulate the money supply instruments of the single common currency in determining the level of money supply appropriate for the entire monetary zone currently comprising of the six WAMZ countries under investigation. Consequently, the interest of this research work is in determining if these monetary expansion hypotheses hold for the six WAMZ economies under the tests of the hypotheses. Given the inflationary implications of monetary expansion, results obtained would be of significance for the expected common monetary expansion activities and inflation moderation within the context of an eventual single monetary policy for the proposed monetary union and particular in the eventual situation in which the fiscal policies are left in the hands of the sovereign national governments.

## 2. Model and Methods

The models derived from these hypotheses reflect changes in money supply as a function of changes in government budget balance and changes in international reserves thus:

$$\Delta MS = f\{\Delta BB, \Delta IRV\}$$

where  $MS$  is money supply (M1),  $BB$  is government budget balance,  $IRV$  is international reserve position. This is modelled as:

$$\Delta MS_t = \alpha + \beta_1 \Delta BB_t + \beta_2 \Delta IRV_t \quad 1$$

The autoregressive distributed lag dynamic effects are introduced into the model of monetary expansion and Equation 1 extended with lagged values of the dependent and independent variables. Consequently, the estimated monetary expansion econometric equation is:

$$\Delta MS_t = \alpha + \beta_1 \Delta BB_t + \beta_2 \Delta IRV_t + \beta_3 \Delta m_{t-1} + \beta_4 \Delta BB_{t-1} + \beta_5 \Delta IRV_{t-1} + \varepsilon_t \quad 2$$

The parameters of interest are  $\beta_1$  and  $\beta_2$ .

Fixed Effects (within), Random Effects Generalised Least Square and Random-effect Maximum Likelihood regressions are the three unbalanced panel data estimation methods employed for annual data of money supply, budget balance and international reserves, spanning averagely over the period between 1980 and 2014.

## 3. Results and Findings

The results of the three unbalanced panel data estimation results displayed in Table 1 below revealed some close similarities, particularly in the random effects estimations. Although, the explanatory variables are jointly significant in the estimation, only budget balance coefficients are significant at 1% level of significance and most estimated variables yield statistically insignificant results.

**Table 1: Results of Panel Estimations of the Monetary Expansion Hypothesis**

<b>Dependent Variable: Money Supply Growth</b>			
<b>Variables</b>	<b>Results of Estimation Methods</b>		
	<b>Fixed Effects (within)</b>	<b>Random Effects GLS</b>	<b>Random Effects ML</b>
<i>ΔBudget Balance:</i>	-0.0003* (0.0001)	-0.0003* (0.0001)	-0.0003* (0.0001)
<i>ΔInternational Reserves:</i>	9.9669 (16.0626)	12.2621 (15.7704)	12.2621 (15.4473)
<i>Lagged Money Supply:</i>	1.0574* (0.0921)	1.1037* (0.0854)	1.1037* (0.0836)
<i>Lagged ΔBudget Balance:</i>	-0.0004* (0.0001)	-0.0003* (0.0001)	-0.0003* (0.0001)
<i>Lagged ΔInternational Reserves:</i>	-0.1654 (16.6852)	-0.5591 (16.3834)	-0.5591 (16.0479)
<i>R<sup>2</sup>: Overall</i>	0.56	0.56	
<i>Between</i>	0.99	0.99	
<i>Within</i>	0.52	0.52	
<i>F-statistics:2.36 (0.00)</i>	29.54 (0.00)		
<i>Wald Chi<sup>2</sup></i>		182.28 (0.00)	
<i>LR Chi<sup>2</sup></i>			117.37 (0.00)
<i>Observations</i>	148	148	148

Source: EIU Database, Author's Estimations and Stata 14 Output

The Hausman test was however performed in making the choice between the fixed and random effects estimations. The null hypothesis of Hausman test is that the differences in coefficients are not systematic estimated, meaning that the coefficients of the fixed and random effect estimators are same. The simple decision rule is that if the p-value of the test is insignificant (that is Prob>chi<sup>2</sup> is greater than 0.05), the option is to apply the use of the results of random effects estimations. A significant p-value favours the use of fixed effects estimator. The result of the Hausman test performed for the fixed effects and random effects estimations revealed Prob>chi<sup>2</sup> of 0.61 implying the rejection of the fixed effect model of monetary expansion towards the appropriateness of the random effects model.

The output of the random effects coefficient reveals low negative and positive explanatory powers of changes in budget balance and international reserves respectively. Under both the GLS and ML random effects regressions, the results yield evidence to support the rejection of the budget deficit hypothesis which postulates that

the size of government budget balance significantly affects monetary expansion. In the WAMZ this is at the very low negatively signed coefficients of -0.0003 for budget balance, which are statistically significant at 1% level of significance in both random effects results. On the other hand, the estimation results for international reserves show no statistical significance, meaning that no linear relationship information is provided in this case, for all the WAMZ countries assessed.

#### **4. Conclusions:**

In testing monetary expansion hypotheses, applying a panel data estimation, the random effect output reveals that the Government-push Hypothesis/Budget Deficit Hypothesis holds while there was no evidence of such for the Balance of Payment Surplus Hypothesis. This is an indication that fiscal deficit changes (which will be in control of politicians and fiscal authorities at national levels) impacts money expansion/contraction while balance of payment surplus showed no evidence of this. These results suggest that for the WAMZ as a future monetary union, it is likely that with the effects of past changes in money supply and budget balance, there would be contraction of monetary base whenever budget balance goes up. The implication of this for the monetary union is that conflict of interests (in between actions at both national and union levels) in monetary expansion decision. These are essential results for the conduct of the future common monetary policy in the WAMZ where it is very likely that the conduct of fiscal policies (like in the EMU) would be left in the hands of the sovereign governments at the national levels.

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