

# An econometric analysis of the impact of monetary and fiscal policies on non-oil exports in Nigeria: 1974-2003

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## Abstract

This study set out to analyze the impact of monetary and fiscal policies on non-oil exports in Nigeria from 1974 to 2003. Economic policies aimed at influencing economic targets are mostly dominated in monetary and fiscal policies, although we also have trade policies. Interest rate, budget deficit and exchange rates are employed as regression variables representing monetary policy and fiscal policy. Using Ordinary Least Squares estimation, the study reveals that both interest rate and exchange rate, being proxies for monetary policy, negatively affect non-oil exports. Budget deficits – proxy for fiscal policy also has a negative effect on non-oil exports. All variables came out with the expected signs. The model specified had a significant explanatory power in respect of non-oil exports. There was no evidence of serial correlation or autocorrelation, multicollinearity and heteroscedasticity. Based on the foregoing, this study recommends that for positive effects of monetary and fiscal policies on non-oil exports in Nigeria, there is need to formulate a new strategy to address the identified challenges. This would be anchored on macroeconomic stability, export promotion, rationalization of the role of government, fortification of infrastructural facilities and stimulation of demand for goods and services. It would create an enabling investment climate.

## Introduction

Monetary and fiscal policies can be used to influence macroeconomic objectives as well as to fine-tune and direct the economy to achieve the policy goals of internal balance and external balance. Monetary policies deal with the discretionary control of money supply by the Monetary Authorities in order to achieve some goal. They are a

combination of measures or actions designed to regulate the value, supply and cost of money in an economy.

A well articulated monetary policy is generally targeted at attaining price stability, low inflation, stable and competitive exchange rate, favorable balance of payments, influence level of output and positive rate of economic growth, check excess growth in aggregate liquidity in the economy and satisfactory level of employment.

Fiscal policies are mainly concerned with the control of government expenditure and revenue programs. A prudent and sustainable fiscal posture promotes the attainment of the following objectives; non-inflationary economic growth, low and stable levels of fiscal deficit and government debt, reduction of budget imbalances in situations of high fiscal deficit and public debt.

A look at the Nigerian economy from its exports perspective will broadly categorize the economy into oil and non-oil exports. These are its sources of foreign exchange earnings.

Monetary and fiscal policies are complementary. The choice or application of one policy over the other depends on the situation of the economy at the particular point in time.

Economic growth propelled by the non-oil sectors of the economy were essentially driven by Agriculture 7.06% in 2005 and 7.17% in 2006; Manufacturing 9.61% in 2005 and 9.71 in 2006; Telecommunication 29.61 in 2005 and 31.98 in 2006; Banking and Finance 2.75% in 2005 and 3.13% in 2006 and Wholesale and Retail Trade 13.51% in 2005 and 13.73% in 2006. Non-oil export grew by 24% in 2006. (Soludo, 2007)

The Central Bank of Nigeria (CBN, 2005), attributed the rise in non-oil export proceeds largely to the variation in the prices of some of the commodities traded at the international commodities market.

As a result of the need to sustain the current increase in government revenue, particularly non-oil revenue various measures have been taken to improve the revenue position and improve on the real sector. However, "most efforts in the past were focused

on checking government expenditure and limiting imports of consumables” (Lemo, 2004). This has not had the desired effects on the economy.

With the discovery of oil and its boom in the 1970s, great basic changes occurred in the economy. At first the trend was perceived beneficial. There was heavy dependence on crude petroleum exports as the main source of foreign exchange earnings and government revenue. By 1980 the sector which at one time, accounted for 22 percent of GDP provided 80 percent of government revenue and over 96 percent of export earnings (Anyanwu, 1993).

The mid 1980’s witnessed a collapse in foreign exchange earnings in the international market due to the oil glut and as a result, an economic crisis emerged in Nigeria. The economy was badly hit.

Obviously, the oil sector has rebounded in recent times. Nigeria has benefited from 2 oil booms (windfalls) in the past. The first was during the 1973 / 74 oil crises, when the Organization of Arab Petroleum Exporting Countries (OAPEC), consisting of the Arab members of OPEC plus Egypt and Syria, announced, as a result of the Yom Kippur War, that they would no longer ship petroleum to nations that supported Israel in its conflict with Syria and Egypt. These included the United States and its allies in Western Europe. (Yergin, 1991), while the second was during the Gulf war of 1990 popularly termed “Gulf Oil Windfall” (LaFeber, 2002).

It is thus the interest of this work to assess the major economic policy tools in relation to their respective impacts on non-oil exports (real sectors) of the Nigerian economy using an econometric approach.

The objectives are to determine the effect on non-oil exports of fiscal policy measures of deficit financing, determine the effect on non-oil exports of monetary policy measures of interest rate and exchange rate and elicit some constraints in the promotion of non-oil export commodities.

This study would assist policy formulation from the government and authorities concerned because there is still need to increase earnings from the real sector of the economy. A more vibrant real sector implies increased production of non-oil goods and services and contribution of non-oil exports to the growth of the economy. It would if

properly managed also reduce the problems of unemployment, increase government revenue and reduce high costs of living, amongst others.

The evaluation of the effects of monetary and fiscal policy on non-oil exports in Nigeria necessitates the following hypotheses:

$H_{01}$ : The monetary policy variables (interest rate and exchange rate) do not have a significant effect on non-oil exports in the economy, thus,  $H_{01}: b_1 = b_2 = 0$

$H_{A1}$ : The monetary policy variables do have a significant effect (are determinants) on non-oil exports in the economy, that is:  $H_{A1}: b_1 \neq b_2 \neq 0$

$H_{02}$ : Fiscal policy (budget deficits) does not have a significant effect on non-oil exports in the economy, thus  $H_{02}: b_3 = 0$ .

$H_{A2}$ : Fiscal policy has a significant effect on non-oil exports in the economy, that is:  $H_{A2}: b_3 \neq 0$

Where:

$b_1$  : the coefficient of interest rate - monetary policy

$b_2$  : the coefficient of exchange rate – monetary policy

$b_3$  : the coefficient of budget deficit - fiscal policy

$H_0$  : null hypothesis

$H_A$  : alternative hypothesis

The study would determine the relationship between non-oil exports and the variables under consideration.

#### Literature review on objectives and instruments of monetary and fiscal policy

The broad objectives of monetary policy according to Anyanwu (1993) include the enhancement of rapid economic growth and development, the control of inflation and maintenance of relative price stability consistent with high rate of employment and maintenance of healthy balance of payment position to attract exchange rate stability.

Some objectives can be successfully achieved at the expense or failure of the others. The presence of conflicts in attaining monetary and fiscal policy objectives necessitates trade off in order to compromise. The pace, ranking and direction should be set by the economic situation.

Onoh (1982), in trying to classify the instruments of monetary policy, grouped them into broad categories namely those that are general in nature and those that are selective in nature. The general instruments include moral suasion, discount and interest rate policy, Open market operations; cash reserve ratio, liquid asset ratio and specific deposits. These instruments can reduce the volume of bank credit available in the economy.

On the other hand, the selective instruments include credit ceiling, credit discrimination in favor of indigenes, selective credit control and control of non-bank financial institutions. These can affect the direction of the available credit. The selective instruments are relatively new but they have proved very effective in developing countries, where financial resources are scarce and where economic priorities are of wide range.

### Methodology

“Applied econometric research is concerned with the measurement of the parameters of economic relationships and with the prediction (by means of these parameters) of the values of economic variables” (Koutsoyinnis, 2001).

#### Rationale for choice of variables

Nnanna (2001) posits that over the years, Nigeria has applied different regimes of monetary policy, ranging from exchange rate targeting through monetary targeting to deregulation. Thus, the instruments of emphasis have changed from time to time.

In recognition of this and the fact that each regime of policy must have caused certain shocks to the non-oil exports sector which responsiveness depended on the targeted instruments, this study adopts interest rate and exchange rate as key monetary policy variables.

Unlike the Open Market Operations (OMO) which began in 1993, both variables have observations covering the period of study. Whereas interest rates captures the cost of capital to non-oil producing firms, exchange rate captures the value of their foreign transactions based on the interplay of market forces or in some situations on the direction the monetary authority's desire.

On the other hand, the main instruments of fiscal policy in developing countries are taxation, expenditure and deficit financing. Budget deficits are a major outcome of government's fiscal actions, and imply that the primary balance of government is negative, that is, expenditures exceed revenue. The choice of budget deficit as the fiscal policy variable is informed by several considerations.

First, the method of deficit financing, which is capable of either generating inflation or crowding out private sector access to credit, may impact negatively on non-oil export growth.

Secondly, the components of government expenditures resulting in the deficit (public consumption or public investment) which have opposite effects on growth.

Thirdly, budget deficits, being a linear combination of two series (revenue and expenditure) which have been found to be non-stationary in most studies (Gujarati, 2003) is expected to be stationary by inspection, thus increasing the plausibility of the results of this study. Budget deficits are a major consequence of government's fiscal actions. It has a direct relationship with the non-oil sector of the economy. Budget imbalances leads to fiscal deficits and public debt.

The specification of the econometric model is anchored on economic theory. Economic theory indicates the general factors that affect the dependent variable.

The function in this case is specified as follows:

$$N = F (IR, ER, BD) \quad (1)$$

Where

N = Non-oil exports measured in Naira (million)

IR = Interest Rate percentage

ER = Exchange Rate (Naira per unit of US dollar, AFEM)

BD = Budget Deficits (Millions of Naira)

The budget deficit is the net of Total Government Revenue and Total Government Expenditure and is an indicator of fiscal policy. Thus the resultant equation for estimation in this study is as follows:

$$N = b_0 + b_1 IR_t + b_2 ER_t + b_3 BD_t + U \quad (2)$$

Where:

$b_0$  = the intercept term of constant element

$b_1, b_2$  &  $b_3$  = partial regression coefficients

U = the stochastic disturbance term

The function is linear in both the parameters and variables because the parameters and variables appear with a power or index of 1 only and are not multiplied or divided by any other parameter or variable. The problems envisaged with this model were autocorrelation. Tests for autocorrelation were performed using the Durbin-Watson (DW) statistic and Breusch-Godfrey LM test for serial correlation. The coefficients of the monetary and fiscal variables were checked. The results showed no serial correlation or autocorrelation in the regression residuals and also confirm the structural stability of the model.

#### “A *PRIORI*” Expectations

Economic theory suggests the expected signs of the parameter estimates:

$b_1$  is expected to be negative because as interest rates rise, some non-oil firms may not have access to credit facilities from banks hence would not have the needed finance to boost their businesses which will lead to a fall in exports. Likewise, if interest rates fall, firms and households may have more money to invest in the real sector for greater profit thereby leading to increased exports.

$b_2$  is expected to be negative, because the value of currency appreciates when exchange rate rises, implying that non-oil exports will be expensive abroad and thus in lower demand. High cost of foreign exchange leads to high costs of raw materials, spare parts, machinery and equipment.

$b_3$  is indeterminate because if government is a major consumer of non-oil goods, its higher expenditure on such expenditure would reduce non-oil exports. On the other hand, if government's increased expenditure is in the form of capital expenditure on infrastructure and provision of basic services that aid in production, then it would inevitably increase non-oil exports. Otherwise, it would not have a significant effect.

#### Techniques for Evaluation of Results

The reliability of the OLS estimates will be evaluated and determined by

- (i) Economic *a priori* criterion: Theoretical *a priori* evaluation of the signs of the parameters is employed as determined by economic theory.
- (ii) Statistical criteria (First - Order Tests): These include  $R^2$  and  $R^2$  adjusted to measure the success of the regression in predicting the values of the dependent variable within the sample.
- (iii) Econometric Criteria (Second – Order Tests): Durbin-Watson's 'DW' statistics is checked for Autocorrelation. The Breusch-Godfrey LM test for serial correlation is used to complement the Durbin-Watson test. In other words, the "goodness" of the estimates will be judged.

#### Results

The objective of this paper is to determine the effect of budget deficit, interest rate and exchange rate on non-oil exports in Nigeria and elicit some constraints in the promotion of non-oil export commodities. The results of the regression executed with EViews are presented in Table 1.

The empirical evidence derived from the results reveal that changes in interest rate, exchange rate and government budget deficits do largely explain changes in non-oil exports, given the  $R^2$  of 0.975 and a highly significant F-statistic of 340.15 at 1% level of



significance. This implies that 97% of the recorded changes on the dependent variable is caused by the independent variables while the remaining 3% is caused by the error term or the impact of the stochastic variable.

Table 1: Regression Results

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N =	- 94.7884	- 0.15184IR**	- 0.01886BD**	- 0.27790ER***
	(360.98647)	(0.02454)	(0.00679)	(0.2555)
	[-0.26]	[-6.19]	[-2.78]	[10.88]

  

R<sup>2</sup> = 0.9752  
 Adj. R<sup>2</sup> = 0.9723  
 F = 340.15\*\*\*  
 D.W. = 1.803  
 LM = 0.235135

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N/B: Statistical significance at the 1%, 5% and 10% levels is denoted by (\*\*\*), (\*\*) and (\*) respectively. Standard Errors are in ordinary brackets. t- values are in square brackets.

Table 4.1 shows that both IR and ER variables were negative, in line with our expectations from economic theory. The BD coefficient had a negative sign.

Table 4.1: Summary of *a priori* expectations and actual outcomes

Explanatory variables	a priori expectation	Coefficients
IR	$b_1 < 0$	- 0.15184
ER	$b_2 < 0$	- 0.27790
BD	$b_3 \pm 0$	- 0.01886

The Durbin-Watson test produced a figure of 1.803, which is close to the ideal value of 2.0. In the range of 6, i.e.  $\pm 3$  from the ideal value of 2, this clearly shows no autocorrelation present.

To firm this up, Breusch-Godfrey LM test for serial correlation was also reported. The F-statistic of 0.235 with a probability of 52% is not significant and this implies that there is no serial correlation. Therefore, we accept  $H_0$  implying that there is no autocorrelation. With this outcome the model appears econometrically sound for forecasting.

### Discussion

#### Effect of interest rate on non-oil exports

The multiple-regression executed with EViews 4.1 reveals that interest rate has a negative sign because interest rate, being a price paid to obtain credit, that is, the price of credit to the non-oil firms, is a major constraint to access to finance by non-oil firms. The interest rate series strongly support the *a priori* expectations. Finance is very crucial to every firm.

It could also be viewed from the cost angle. As interest rate increases, firms face an interest burden which impacts on their cost. As their costs rise in turn, they may be forced to scale down on production to arrest run away cost. This may invariably lead to a fall in production unless, the high interest rate, other things being equal, attracts foreign capital and increases foreign exchange inflow, leading to increased investments and production.

#### Effect of exchange rate on non-oil exports

The exchange rate series strongly support the *a priori* expectations. This can be explained by fundamental exchange rate principles. The exchange rate reflects the international (foreign) price of the commodities at a particular time. Therefore, as the domestic currency appreciates, locally produced export goods begin to command higher prices abroad. The higher prices force down foreign demand for such goods, which then leaves the producing firms with large inventories. Subsequently, they have to reduce production, doing so gradually in the short run and more intensely in the long run.

In an economy that is dominated by international trade, the exchange rate – i.e. the price of foreign currency is the most important price in the economy as it will affect and could be used to influence virtually all other prices for the purpose of controlling the economy. Furthermore, inflation, being an aftermath of monetary policy and deficit financing, would have an effect on exchange rate. It has been mentioned that if the exchange rate is too low such that the local currency is over-valued, import will be cheap, thus encouraging import while export will be expensive when its price is converted to foreign currency thus discouraging other countries from buying. On the other hand, high exchange rate or under-valuation of the local currency will stimulate export and discourage import. Exchange rate policy can therefore be used to achieve macroeconomic objectives especially as it relates to non-oil exports.

#### Effect of budget deficit on non-oil exports

The coefficient of budget deficit (BD) came out negative because budget deficits are generally associated with expansionary (heavy spending) fiscal policy. Government finances debt from deposits of money in banks (DMB's) or from CBN as 'Ways and Means'. If it does so from DMB's, private firms including non-oil firms, will be choked out of access to credit, hence less finance, less production and ultimately, reduced exports. If government borrows from CBN, the CBN may adopt a contractionary Monetary Policy Rate (MPR) and increase mop up of liquidity through Open Market Operations (OMO) which would ultimately drive interest rates up. This would make borrowing unattractive to non-oil firms, thus constraining their finances, which would invariably result in lower production.

#### Conclusion

A nation's Balance of Payments (BOP) position is chiefly determined by the relative balance between import and export, which are made up of goods and services. Exports are revenue earners for an economy. In Nigeria, we have oil and non-oil exports. The non-oil exports include agriculture, manufacturing, telecommunications, banking and finance, wholesale and retail trade as well as minerals.

The variables that stood as proxies for fiscal and monetary policies showed that there exists an inverse relationship between them (i.e. interest rate, exchange rate and budget deficit) on one hand and the growth or fall of non-oil exports on the other hand.

On the constraints in the promotion of non-oil export commodities, the poor performance of non-oil exports has been blamed largely on the high cost and high price profile of non-oil commodities, which have made them uncompetitive in the world market. Other major constraints on the growth of non-oil exports include: inadequate and decaying infrastructure, poor funding, over-regulation and poor legal framework, under-developed regional markets and policy instability.

Some lingering problems include low level of technology, exclusive public sector ownership of the core industrial projects and utility enterprises, low level of capacity utilization, low investments, high cost of production, high rate of unemployment and inflation. When there are inflationary pressures, exports are low because prices are too high. As a remedy, policies should be aimed at increasing productivity to lower prices and increase exportation.

#### Recommendations

Based on the empirical evidence of this study, the following recommendations are made. First, for positive effects of monetary and fiscal policies on non-oil exports in Nigeria, there is need to formulate a new strategy to address the identified challenges. This would be anchored on macroeconomic stability, export promotion, rationalization of the role of government, fortification of infrastructural facilities and stimulation of demand for goods and services. It would create an enabling investment climate.

Second, considering the importance of the exchange rate as a major price that affects all sectors of the economy and all economic agents, it is imperative to monitor the movements in the real exchange rate in order to foster competitiveness and improve the supply of exports in the medium to long term. Policies that at worst, keep the exchange rate stable are desirable. In this regard, The Central Bank of Nigeria should continue to intervene in the foreign exchange market to maintain stability.

Third, there may be need to further liberalize the foreign exchange market by allowing community banks to market foreign exchange just like DMB's and Bureau de

Change (BDC). This would expand the supply of such and help bring stability to the market, while not making the foreign currency itself appreciate as this could cause shocks to output especially if most raw materials are sourced abroad.

Fourth, there is need to encourage the consumption of locally produced goods and encourage production via strict policies that will discourage imports. An enduring policy to encourage Nigerians to produce and consume locally made products will be helpful. An example can be seen in the ban on importation of more goods which has resulted in the growth of locally made and even indigenous producing and processing concerns such as Dangote Group, a conglomerate exporting non-oil products to the West African Sub-region.

Fifth, government fiscal actions must be monitored to ensure that they do not spiral out of control. While not totally canvassing for a contractionary budget, this paper is of the view that if deficits are curtailed to the barest minimum through forward-looking efforts such as cutting government expenses on overheads, non-performing parastatals and monetization, the country can reap from such. Alternatively, if the source of the deficits is expenditure on production supporting services and items such as communication, transportation network, etc, the economy would also benefit. Emphases are made towards boosting non-oil exports to augment oil revenues. This would increase GDP which invariably would increase revenue from taxes.

In another development, worried by the rise in interest rates in the country, the Central Bank of Nigeria (CBN) introduced a new policy framework that will usher in a market-driven interest rate regime. The policy, Monetary Policy Rate (MPR), which became operational from December 11, 2006, is tailored to bring down lending rates to between 7 percent and 13 percent. By the move, the MPR has replaced the Minimum Rediscount Rate (MRR), which was hitherto the level at which banks obtained credits from the CBN.

The new framework for monetary policy implementation in the market uses the short-term interest rate as its “Operating Target” to achieve a stable value of the domestic currency through stability in interest rates around an operating target called the MPR. The interest rate shall be determined and operated by the central bank. This is laudable and

should be pursued vigorously to help drive interest rates down so that access to credit is enhanced.

Finally, emphasis is laid on the need to further revolutionize the non-oil sectors of the economy and encourage growth in output.

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