Monetary Policy Adjustments under Alternative Inflationary Conditions: The Nigerian Case

By

Opue Job Agha
Bankong B.
Research Article

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Opue Job Agba¹*, Bankong B.²

¹Department of Economics, University of Calabar, Calabar.
²Department of Economics, University of Nigeria, Nsukka.

*Corresponding Author’s Email: ngaji74@yahoo.com, Phone: +2347062522700

ABSTRACT

This work provides an answer to the question: what should be the appropriate monetary policy under different inflationary conditions (that is, demand-pull and cost-push inflations) and what should be the effect of this non-distinction in the direction of monetary policy? Since no modern economy is autarky, the Nigerian economy is considered and examined analytically. Therefore, a conclusion that the problem of macroeconomic instability faced-with in countries like Nigeria, is as a result of the applications of inappropriate adjustments in monetary policy under different inflationary conditions is drawn. Thus, a recommendation that expansionary monetary policy be adopted for such countries is prescribed, but to an extent where a unit increase in cost must correspond with a unit increase in broad money supply. Likewise, such economies like Nigeria are encouraged to increase their exports and reduce imports in order to redress the problems of cost-push (imported) inflation.

Keywords: Monetary-Policy, Demand-pull, Cost-push, Inflation.

INTRODUCTION

Like many issues in Economics, there is no consensus amongst the Economist with regards to the effectiveness or usefulness of monetary policy measures in regulating an economy, or what should be the direction or transmission mechanisms of such measures (Jansen, 1983; Kaldor, 1980; Parkin & Swoboda, 1977; Pierce & Shaw, 1977; Laidler, 1981). So the state of the arts is that the thrust, direction or usefulness of monetary policy measures are still very subject to contention and to some extent the arguments are subjective depending on who is on board or which school of thought one belongs to. For instance, to the classicalists, inflation is strictly a monetary phenomenon. Any increase in the level of inflation requires an equivalent proportional decrease in the quantity of money to bring it down (Fisher, 1920; Friedman, 1956, 1971). This does not distinguish between the types of inflation or economic structures. The classicalists, keynesians and monetarists arguments are actually about the effect of changes in money stock, hence the transmission mechanism (Schiller, 1991; Byrns & Stone, 1989).

Some economists like Hicks (1975), Kaldor (1976) and Oppenheimer (1977) have referred to issues of appropriate policies under conditions of cost push and demand pull inflation, but their essential cost is usually associated with local labour cost, the inevitable consequences of increases in wages and other fringe benefits in excess of the increases in labour productivity. They ignore important cost elements - imports, necessary for import dependent economies. Here, our concern is in costs which are exogeneously induced - the inevitable consequences of increases in cost of imports.

However, the consequences of the non-defferentiation in the direction of policy can be very grave. Blair (1975) noted that the inappropriate application of monetary policy led to the 1940s – 1970s depression. This is an indication of the severity of the consequences of non-distinction in the direction of policy. It also reveals how policy makers have in the past been applying monetary policy measures indiscriminately. For instance, a cursory look at the Nigerian case shows that irrespective of the types of inflation, reduction in money supply is normally prescribed and used to combat inflation (Ojo, 1992; Sanusi, 2001) and yet the problems of inflation remains unabated.

Again, an impression is created by some schools of thought or individuals that monetary policy measures are ineffective in developing countries as opposed to advanced countries (Masson et al, 2003); models are used to explain and generalize seemingly paradoxical behaviour of prices in industries for policy prescription (Blair, 19759). It is therefore not certain whether monetary policy measures will have the same effect given the differences of the economic environments, the nature or orientation of costs and the structure of the economy.
But inspite of these problems, monetary policy measures are still being used extensively by governments without any clear understanding of what should be the proper direction/adjustments and this often results in failure to redress the problem of macroeconomic instability they were set to solve (Ojo, 1992; Sanusi, 2001; Nnanna, 2002).

Based on the above exposition, this paper seeks to:

(a) examine and discuss within the context of an import depended economy - in this case Nigeria, what should be the appropriate monetary policy under conditions of cost push and demand pull inflation, given the objectives of macroeconomic stability. Then, we will show that the non-distinction in the adjustments in monetary policy under different inflationary conditions could lead to greater macroeconomic instability.

(b) help explain and give reasons why the signs of the coefficients of money supply in various empirical works in Nigeria are usually wrong or the variables insignificant as the case may be (see Ajayi and Teriba, 1974; Ekpo and Osakwe, 1991; Nwaobi, 1995; Fullerton and Ikhide, 1997).

Review Of Related Literatures And Empirical Works

The monetarists arguments that increase in money supply is likely to cause an increase in price has been subjected to several scrutiny and tests by economists, some of which are Harberger, Vogel, Thomas, Hanson and a host of other Nigerians. Harberger (1963) tested the monetarist interpretation for Chile for the period 1939 – 1958 and came to a conclusion that the annual rate of inflation was well explained by the rate of growth of money supply. His analysis therefore corroborates the monetarist hypothesis. Haberger’s arrangement was extended by Vogel (1974) to cover twenty-two countries and he also found broad support for the monetarist hypothesis. But such support could be faulted by confusingly high correlation between the rate of money supply growth and inflation with a causal relation and offering a cogent analysis of the links between high inflation and high monetary growth.

In 1985, Hanson extended Harberger’s framework to incorporate import cost. An implicit cost function was utilized to derive an aggregate supply curve which induces local prices of imported inputs. When the underlying production function is homogeneous and of degree one, inflation becomes a weighted sum of money supply changes and import prices. The model also implies that the elasticity of inflation with respect to money growth is less than one. Thomas (1986) presents a graphical illustration in support of the monetarist view of the average money growth rates and average inflation rate empirical by eleven nations during the 1980 – 1984 period. The figure indicates a rather strong positive association between money growth and inflation. Countries with relatively low money growth such as France and Italy experienced relatively low inflation while countries with high money growth such as France and Italy experienced severe inflation. It was interpreted therefore that the strong statistical association between money growth and inflation is evident that the primary causes of inflation is excess money growth.

However, the monetarist explanations for inflation in the United Kingdom (UK) to further support the position of Friedman has been advanced by Morgan (1975), Walter (1975), Laidler (1978) and Parkin (1975). According to Morgan, government in UK have caused inflation because they have spent more than what they have been willing to raise by taxation or by borrowing from non-bank sources. They are willing to borrow from the non-bank private sector to finance a budget deficit because of the electoral consequences of high interest rates required to induce the private sector to land them. They therefore borrow from the banking sector thereby increasing the money supply.

Laidler agrees with this analysis, that the basic error committed has been the neglect to control the money supply while pursuing an unrealistically low unemployment target, primarily by fiscal means. Monetary expansion, largely a bye- product of full employment fiscal policies, has been responsible for the high British inflation rates of the 1970’s. In summary, Parkin proffers a sequence of events: that expansion creates an overheated economy; initially the response is inventory reduction, longer delivery dates and overtime working; then wages prices are marked up at a faster rate; then there is an upward revision of inflation expectations, then wages and prices rises quite independently of the current state of demand.

On policy implication, the monetarists advocate that if this is inflation, it should be tackled by a gradual and persistent reduction in the rate of growth of the money supply. Another implication of monetarism on which the New Right based their employment policy recommendation (Wood, 1972; 1975), is that microeconomic policies should be undertaken to reduce the natural rate of unemployment. These include getting rid of imperfections in the labour market which raise the natural rate. These imperfections includes Union practices; for example, entry restrictions and the ‘Closed shop’ which restrict occupational mobility; government legislation such as the employment protection act which reduces the willingness of employers to employ; high unemployment benefits which ‘reduces the willingness of some workers to work’; regional policies and housing policies which interferes with the market mechanism, and which make for geographical immobility; and income policies which reduces differentials and hence reduce occupational mobility.
However, critics of monetarism believe that inflation develops a powerful ‘inertia and is very costly to eradicate via monetary restriction’. These critics believe that monetarists are a little too free and easy in offering up the suffering of others - the unemployed as a cure for the complex problem of inflation (Thomas, 1986). For Wilkinson (1980), monetary restriction will eventually reduce demand, even if velocity of circulation is variable, but because muchly by tie of the labour market is not competitive, many workers can resist reduction in their real wages. This restrictive monetary policy prescribed by the monetarist springs from their conception that inflation always comes from the demand side. The non-monetarists dispute this claim; that inflation can also be initiated from the supply side, chiefly by the pushing up of wage cost by Union workers (Hicks, 1975; Kaldor, 1976; Jackson, Turner and Wilkinson, 1972). Hicks support this view by referring to the sharp movement against the UK in the terms of trade in 1972, 1973 and 1974 (1972=104; 1974= 77), where internal cost rose proportionately with import costs, he finds the monetarist policy prescription, deflation, inappropriate for cost inflation because wage rates would not respond as they predict.

However, on policy implications, non-monetarists advocates that while the monetary and fiscal restraint may have some part to play in the control of inflation, severe contraction has drastic consequences on output and employment while its effect on the rate of inflation is in some doubts. They consider that some form of incomes policy may be appropriate for wage cost-push inflation (Hicks, 1975; Blackaby, 1978).

In Nigeria, a lot of research works showing the relationship between money supply and inflation has been conducted. All the results reveal that money supply does not have a significant relationship with inflation. Likewise some research works have also shown that money supply has no significant relationship with output in Nigeria. The reasons advanced for these insignificant relationship is that monetary policy in Nigeria is ineffective. (Ajayi and Teriba, 1974; Ojo and Ajayi, 1981; Nwaobba, 1995; Adamson, 1989; Asogu, 1991; Fakiyesi, 1996; Afolabi and Efunwoye, 1995; Fullerton and Ikhide, 1997).

The divergent views on the several causes of inflation are explicitly depicted in the various research works review and of course, some researchers investigated on the impact or effect of monetary policy (using broad money supply, narrow money supply and domestic credit) on inflation and output. Inspite of these researches, none appears to reveal the direction of monetary policy under conditions of cost push and demand pull inflation in Nigeria particularly. Hence, there is need for re-examination.

**Frame Work Of Analysis**

Here, we re-examine the issue of different adjustments in monetary policy under conditions of cost-push and demand-pull inflation. To facilitate our analysis, we make the following assumptions:

(i) The economy is 100% dependent on import for the production of goods and services.
(ii) Local cost reflects totally the cost of import; as cost of import increase, production cost also increase. This is merely for expository reason given that the Nigerian 4th National Development plan specifies 60% level of dependency on import.
(iii) Aggregate demand is a function of price. That is $D = f(P)$.
(iv) By assuming a stable relationship between exchange rate and price, the increase in the price of imported factors will lead to an increase in domestic price.
(v) As import becomes more and more expensive, amount that would be imported will decrease. But if we assume that the availability of foreign exchange is not a problem, it therefore follows that the firms have the capacity to import whatever they want.

**Monetary Policy Under Cost-Push Inflation**

From our classical equation of exchange, we have that:

$$M_sV = PY \hspace{1cm} \text{(1)}$$

Where,

- $M_s$ = stock of money in circulation
- $V$ = velocity of money in circulation
- $P$ = price level
- $Y$ = volume of real output.

Where equation (1) captures an equilibrium situation, we also assume that $Y$ is not constant.
As cost of imported good increase, P increases to $P_1$ but $M_s V$ remains constant. So we have that:

$$M_s V = P_1 Y_0 \quad \text{................................. (2)}$$

Where $Y_0 < Y$ and $(Y-Y_0)$ is due to $\Delta D$ due to $\Delta P$ since $D = f (P)$

However, the fall in $Y$ and $D$ will result in a fall in capacity utilization and a rise in the level of unemployment. Thus, deflating the aim of welfare maximization of monetary policy.

Where foreign exchange is available:

Assuming that at the stage of equation (2), a contractionary monetary policy is adopted, where $V$ is stable, it follows that the nominal demand will decrease by decreasing $M_s$ to $M_{0S}$. Hence the LHS of equation (2) becomes smaller. Less money is available to purchase $Y_0$ at $P_1$. Since $P_1$ is exogenously induced, $Y_0$ reduces the more to say $Y_{01}$ as $D$ falls due to the emasculation of the purchasing power. That is,

$$M_{0S} V = P_1 Y_{01} \quad \text{................................. (4)}$$

Therefore, as $Y_0$ falls again, capacity utilization falls leading to a further rise in unemployment, hence, the various circle continues.

However, if at the stage of equation (2) an expansionary monetary policy is adopted, where $V$ is stable, it follows that the nominal demand will decrease by increasing $M_s$ to $M_{S1}$ such that we have,

$$M_{S1} V = P_1 Y \quad \text{................................. (5)}$$

At equation (5), the excess capacity will be fully utilized and employment will return to its former level thereby maximizing welfare. But money supply should be increased only to the level where $D=Y$ (Hence, the optimality condition). Any point outside this level will result in higher inflationary pressure due to increase in $P$ and $M_s$. For Heathfield (1987), any increase in cost should be matched with an equal increase in $M_s$.

Where foreign exchange is not available:

Assuming $P$ increases as a result of increase in the import prices, output falls such that, $M_s V = P_1 Y_0$ as in equation (2). Here, foreign exchange is not constant.

Therefore a change in $P$ could result in a proportionate change in $Y$, such that the equation remains balanced. In this case, a stable monetary policy is needed because if $M_s$ is increased, it will lead to inflationary case where increase in $P$ is as a result of increase in import prices and increase in $M_s$.

**Monetary Policy Under Demand-Pull Inflation:**

Demand pull inflation is induced as a result of aggregate demand exceeding aggregate supply. Therefore, drawing from equation (1) again we have,

$$M_s V = PY$$

If as a result of increase in $P$, $Y$ falls to a minimum, even at zero level which will result in scarcity, such that there will be excess aggregate demand over aggregate supply in the next round and too much money chasing only one unit of output, that is,

$$M_s V > PY \quad \text{................................. (6)}$$

In this case, contractionary monetary policy is required to reduce the excess money in circulation so as to reduce aggregate demand and prices in order to maintain equality in the equation of exchange. This way, the wealth of the people will be maximized.

**Model Specification**

Given that $M_s V = PY$ from equation (1), we apply log to both sides to obtain:
\[ \log(M_s V) = \log(FY) \] \hspace{1cm} (7)

where,

\[ \log M_s + \log V = \log P + \log Y \] \hspace{1cm} (8)
\[ \log Y = \log M_s + \log V - \log P \] \hspace{1cm} (9)

Therefore, by implication,

\[ Y = f(M_s, V, P) \] \hspace{1cm} (10)

But given that Nigeria is an import dependent economy and where velocity of money in circulation is constant, we disaggregate \( P \) into cost push factor (proxied by import cost) and demand pull factor (proxied by external debt) in our equation as follows:

\[ P = f(\text{Cost push factor, Demand pull factor}) \] \hspace{1cm} (11)
\[ P = f(IM, EX) \] \hspace{1cm} (12)

By introducing this into equation (10 ) above we obtain,

\[ Y = f(M_s, IM, EX) \] \hspace{1cm} (13)

In linear form we have,

\[ Y = b_0 + b_1 M_s + b_2 IM + b_3 EX \] \hspace{1cm} (14)

By introducing a product of broad money supply and dummy (Dms) with one (1) for periods of expansionary monetary policy and zero (0) for periods of contractionary monetary policy in Nigeria in our estimable equation we obtain,

\[ Y = b_0 + b_1 (IM \ast Dms) + b_2 (EX \ast Dm) \] \hspace{1cm} (15)

Where,

\( Y \) = Real Gross Domestic Product (RGDP)
\( M_s \) = Broad money supply
\( IM \) = Import cost
\( EX \) = External debt
\( Dms \) = Broad money supply times Monetary policy dummy variable, with one (1) for periods of expansionary monetary policy and zero (0) for periods of contractionary monetary policy.
PRESENTATION OF RESULT

Table 1.1: Result for log of Real Gross Domestic Product

<table>
<thead>
<tr>
<th>Explanatory Variables</th>
<th>EXDMS</th>
<th>IMDMS</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficients</td>
<td>0.1257</td>
<td>0.7954</td>
<td>-3.9403</td>
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<tr>
<td></td>
<td>(0.0013)</td>
<td>(0.0000)</td>
<td>(0.0029)</td>
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<tr>
<td>Adj. R^2</td>
<td>0.6452</td>
<td></td>
<td></td>
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<tr>
<td>DW</td>
<td>1.4797</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F Stat</td>
<td>38.28</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

() = 5% probability values

Interpretation/Discussion of Result

The result of table 1.1 reveals that the coefficients of all the explanatory variables are significant at 5 per cent level of significance. It also reveals that all the explanatory variables except the constants have positive relationships with the dependent variable. This implies that a unit increase in expansionary monetary policy under conditions of demand pull inflation (EXDMS) would result in an increase in output (RGDP) by 0.1257 units. However, a unit increase in expansionary monetary policy under conditions of cost push inflation (IMDMS) would result in an increase in output (RGDP) by 0.7954 units. The adjusted R-squared of 0.65 reveals that about 65 per cent of the variations in RGDP are explained by the variations in the explanatory variables.

Policy Prescriptions

Efforts should be made by the government authorities to identify the kinds of inflation existing in the economy for the purpose of redressing the problem associated therewith through the application of the appropriate monetary policy.

- Expansionary monetary policy should be employed to redress the problems resulting from cost push inflation where foreign exchange is available, but to the extent where the aggregate demand should be equal to the former level of output; that is, any increase in cost of import must be matched by a corresponding increase in broad money supply. But where foreign exchange is not available, the remedy should be the application of a stable monetary policy.

- Contractionary monetary policy should be employed to redress the problems resulting from demand pull inflation.

In Nigeria particularly, the application of expansionary monetary policy will be most appropriate but should be introduced as recommended in (II) above.

Finally, exportation should be highly encouraged in Nigeria while importation should be highly minimized for the purpose of reducing the rate of inflation through increases in cost of imports.

CONCLUSION

However, with the policy prescriptions above, we conclude that the non-distinction in the application of appropriate monetary policy under conditions of demand pull and cost push inflations may result in “depression”.

REFERENCES


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**APPENDIX A**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
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<tr>
<td>EXDMS</td>
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<td>0.036358</td>
<td>3.457774</td>
<td>0.0013</td>
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<tr>
<td>IMDMS</td>
<td>0.795371</td>
<td>0.133355</td>
<td>5.964322</td>
<td>0.0000</td>
</tr>
<tr>
<td>C</td>
<td>-3.940269</td>
<td>1.237695</td>
<td>-3.183553</td>
<td>0.0029</td>
</tr>
</tbody>
</table>

R-squared | 0.662522 | Mean dependent var | 5.272522
Adjusted R-squared | 0.645216 | S.D. dependent var | 0.583400
S.E. of regression | 0.347495 | Akaike info criterion | 0.792617
Sum squared resid | 4.709364 | Schwarz criterion | 0.916737
Log likelihood | -13.64497 | F-statistic | 38.28160
Durbin-Watson stat | 1.479735 | Prob(F-statistic) | 0.000000

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Method: Least Squares  
Date: 02/09/14   Time: 20:45  
Sample: 1970 2011  
Included observations: 42

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