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Structural Disequilibrium and Inflation in Nigeria: A Theoretical and Empirical Analysis

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Abstract

Despite the distorting effects of a civil war followed by an oil commodity boom and bust, Nigeria's inflationary experience can be traced ultimately to excessive monetary growth. Using a basic macroeconomic accounting framework, we develop here a framework for analyzing Nigeria's inflationary experience, and find that any adjustment policy that does not take into account the role of money and credit is likely to fall short of the overall goal of noninflationary economic growth.

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1. Introduction

The high rate of inflation, which Nigeria has been experiencing since the 1970's, has its origin in the economic measures and controls that were first enacted during the Nigerian Civil War of 1967-1970.

Prior to that War, Nigeria practised the open-market economic policy with very little governmental controls. However, this changed during the War which, for the first time, made governmental controls necessary. This, then, gave rise to increasing economic planning and to greater centralization of economic decisions in Nigeria.

Such governmental controls related, among others, to the fixing of prices for certain consumer goods, the determination of the volume of imports and its distribution among consumer and capital goods, the direct participation in the production and the marketing of goods, the determination of the share of wages in income and the control of profit; and the stricter control of foreign investment within the Nigerian economy.

We can not fail to recognize, here, that the increase in government involvement in all aspects of the Nigerian economy would reduce the role of the market mechanism in the development process of that country. Likewise, it should be recognized that these economic policies were firmly rooted in a strategy of 'development through stricter government controls'. The strategy was, also, extended to give the government the leading role of maintaining 'economic fairness' in the country. Then, for the first time in the history of the country, pretensions were made towards social welfarism and, as such, economic nationalism through Nigerianiization became an appealing economic policy. Therefore in the Nigerian case, by looking at the 1970's, we should be able to evaluate the suitability of greater government controls as a means to solving the problems of a developing economy.

Although the problems of a developing economy are many, but in this paper, our attention will be focused on one particular problem, which is inflation. The reason for this choice is that inflation is one of the causes of economic retardation, and also it is a cause of both social and political unrest in many developing economies. Moreover, there is no other economic problem over which the market mechanism has so much influence, and therefore; more appropriate for evaluating the capability of a government in the process of economic development.

2. Price Stability and Growth

Inflation had led to the abandonment of the German currency in the 1920's; and during the 1970's it had led to a national strike in France (1973) and to a national riot in Egypt (1977). Also, almost all free market economies had experienced some degree of protest against inflation.

Surprisingly, in the economic development literature, attention had usually been focused on the Latin American economies as those suffering from the problems of high inflationary pressure; which had been regarded as a permanent feature of their economic structure. Because of this, the study of the causes of inflation in these economies had led to the emergence of the "structuralist" school as opposed to the traditional "monetarist" approach to inflationary theory[1].

Because of the energy crisis of the 1970's, high inflationary rates became widespread. Even, industrialized countries like Britain and Italy recorded annual inflation figure of over 20% respectively. Significantly however, Nigeria, an oil exporting country, also began to experience high inflation rate during this period too; of the magnitude of about 15% - 30% per year. Let us, now, consider the effects of higher inflationary rates on economic growth in the 1970's.

2.1 Results of Previous Studies on Inflation

By first looking at other studies, we find that the cross country data had supported our notion that inflation retards growth. For example, the Economic commission for Latin America's sample data showed a 3% average growth rate per capita for the 'stable' countries as against 2% for the strong inflation countries. Also, U. Tai Wai's sample showed the figures as 6 and 3% respectively, in favor of the 'stable' countries; according to Graeme S. Dorrance[2].

Then, the figures published in The Economist of June 17, 1978 showed that among the advanced industrialized countries, between 1973 and 1978 Britain and Italy which had the highest inflation rates also had the lowest growth rates. Whereas, Japan, Canada and West Germany, with the lowest inflation rates, had the highest growth rates. From these studies, the conclusion was that inflation retarded economic growth. Would the Nigerian experience in the 1970's confirm this also?

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[1] Campos, R.O., “Two Views on Inflation in Latin America”, *Latin American Issues*, edited byA.O. Hirschman, New York, 1961

[2] Dorrance, G.S., “TheEffect of Inflation on Economic Development” *International Monetary Fund Staff Papers*, March 1963.

2.2 The Nigerian Case

If we excluded the 1966-1969 War period from our analysis, then we observed that Nigeria was characterized, on the one hand, by a low inflationary rate of about 4% annual average, in the 1960's. Whereas, these figures rose to about 35% at the peak of inflation in the 1970's. Nigeria was also characterized by a higher growth rate in that period, than in the 1960's. But, one should not be misled to think that the higher inflation rate had led to the higher growth rate; as we shall see in the figures below.

Table 1
Inflation and Growth Rates in Nigeria

Year	Inflation Rate %	Growth Rate* of GDP %
1970	13.8	4.7
1971	15.1	18.4
1972	2.8	7.3
1973	6.1	9.5
1974	13.5	8.5
1975	33.5	2.0
1976	22.1	13.1

Sources: Central Bank of Nigeria, ‘Economic and Financial Review‘, Vol. 14, no. 2 (June 1976) ; Central Planning Office, ‘Third National Development Plan: 1975-80’, Lagos, (April 1975).
GDP was measured at 1974-1975 constant prices.

According to the figures in Table 1 above, if a time lag of one year was assumed before an increase in price would affect production, then the Nigerian case would support the notion that inflation had retarded her economic growth. For example, when in 1970 inflation rate was 14%, the growth rate for 1971 was 18.4%. Then when inflation rate increased to 16% in 1971, the growth rate decreased to 7.3% in 1972. Moreover, when inflation rate decreâsed to 2.8% in 1972, growth rate increased to 9.5% in 1973. Then, when inflation rate increased to 6.1% in 1973, growth rate decreased to 8.5% in 1974. Then inflation rate increased to 13.5% in 1974 and the growth rate decreased to 2.0% in 1975. So the consistency of an inverse relationship between the inflation rate of one year and the growth rate of the next year continued for most part of the 1970's. Therefore, it seemed that the Nigerian data for 1970-1976 had confirmed the negative relationship between inflation and economic growth.

3. Nigeria's Economic Policies

3.1 Monetary Policy

Under Monetary Policy, we wi11 be looking principally at the supply of money as an indication of how the government intended to influence the general price level. Our discovery is that between 1970-1976, the government embarked on a policy of massive monetary expansion; as will be shown in the following table:

Table 2
Rate of Increase In Money Supply in Nigeria

Year	% Increase
1970	54.1
1971	14.3
1972	11.3
1973	18.1
1974	42.5
1975	73.5
1976	81.1

Source: Central Bank of Nigeria, 'Economic and Financial Review', vol.14:2, (June 1976)

In order to realize that these rates of increases in the money supply were, in fact, inflationary, let us compare themwith the growth rates in the supply of goods and services. Foremost, agricultural output fell through the 1970's. Moreover, industrial outputonly grew as follow :

Table 3
Growth of Industrial Output in Nigeria

Year	Percent Increase
1970	11.5
1971	9.3
1972	6.3
1973	11.1
1974	0.4
1975	23.6
1976	15.5

Since money supply grew by about 300% during this period, and industrial output grew by only about 80% while agricultural output was falling; and since import of consumer goods was restricted, then the government's monetarypolicy was in direct contradiction to an objective of controlling inflation.

3.2 Investment Planning Policy

One of the strategy of development planning, during this period, was to reallocate government's spending towards investment and away from consumption. But, to draw up a plan and to implement a plan are two different things, as can be seen in the table below:

Table 4
Distribution of Capital Expenditures

Expenditure By Type	Planned Ratio	Actual Ratio	% of Fulfillment
Economic	70%	54%	-16%
Non-Economic	30%	46%	+16%

Source: First Progress Report (3rd Development Plan of Nigeria)

Judging from the above figures, while there was an under-fulfillment of economic projects, the social and administrative projects were being over-fulfilled. Therefore, the reliance on the government to directly increase the productive capacity of the economy was grossly misplaced. Since this policy did not work, it added to the inflationary pressure by not increasing real output as planned.

3.3 Consumer Goods Supply Policy

Let us, first, note that there were two ways by which the country could increase its supply of consumer goods. These were domestic production and importation. The planning decision, at that time, was to increase the supply of consumer goods so as to reduce the general level of prices. Based on this policy, in 1970-1973, the planners embarked on an import liberalization policy. We should be reminded that during the War, an import restriction policy was imposed on the country.

Although, the increase in oil revenue provided the country with the necessary foreign exchange, but both physical and manpower limitations soon restricted the capability of the Nigerian ports to facilitate the required scale of importation. This was an indirect measure of the amount of imports that were necessary to reduce inflation. Yet by 1974 the planners changed the policy to one of import restriction.The effect of this change was to make the supply of consumer goods inelastic again. As a substitute for imports, the planners hoped to increase the domestic supply of essential commodities.

In this attempt, two separate policies for manufacturing and agriculture were embarked upon. In the case of manufacturing, the planners used tax incentives, protection through import controls and easier capital lending policies. Whereas, in the case of agriculture, the planners embarked on a policy labelled as "Operation Feed the Nation".

The agricultural policy failed because it did not guarantee the peasant farmers any higher reward. Their terms of trade had become so unfavorable as a result of higher prices of manufactured goods. Then, although, urban prices for food were increasing but the farm-gate prices still remained stagnant. Therefore, the farmers had no incentive to increase output as their real income was falling. So this policy soon failed to realize its objective of increasing domestic agricultural output. Also, the policy to increase manufacturing output bacame a direct contradiction to that of reducing inflation. Foremost, the manufacturing plants could only be utilized at about 60% of capacity because of shortage in energy supply. Therefore**,** the scale of operation was still retrictive so that output could not increase enough to the point where cost per unit would be falling.

Secondly, since imports were being restricted at the saure time, this created an artificial monopoly which could only lead to increase in prices. A monopoly, normally, would lead to a reduction in output and an increase in prices; so that an abnormal profit could be made. Once again, inflation was being fueled through bad policy.

3.4 Income Restructuring Policy

During the Civil War, labor strikes were forebidden and increase in wages were restricted. Therefore, immediately after the War in 1970, the Udoji Commission was set up to look into the income structure in Nigeria. Since profit had been increasing at the expense of wages and, since one of the objectives of the government was economic 'equity'; then the Commission recommended an unprecedented wage increase for all workers in the country. The magnitudes of the wage increases were very disturbing, since some wages actually doubled at a time that inflation was high. This, then, explained why the money supply had to be expanded so that the government could have money to pay for all these wage increases. However, the effect of the wage increase was to increase demand while output was not increasing as fast, and as a result led to an increase in inflation.

3.5 Direct Price Control Policy

Since all other policies had not succeeded in reducing inflation, the government then resulted into direct price control; whereby the government fixed the sale price of a commodity. However, since the government's price deviated from the 'just' price, then further distortions were being created within the economic system. This led to the creation of a black-market, and excessive profiteering. Since a black-market only created further shortages, then it reinforced the inflationary pressure. Then, as time went by, the government realized the failure of its direct price control policy; and as such, the policy had to be abandoned. Therefore, Nigeria's inflationary problems, which began in the 1970's; have never been solved.

In order to demonstrate why the governmental policies failed to control inflation, we would need to develop a theory of inflation for the developing economies. Through this theory, we shall show that the rate of increase in the quantity of money and the rate of increase in the marginal prospensity to consume are the two most important economic variables that influence inflation in a developing economy. Therefore, the failure of the government's policies regarding these two economic variables has led to its inability to control inflation in Nigeria.

4. Inflation Theory in a Developing Country Context

The two questions to be addressed in this theory are: (a) What is the relationship between the general price level and the growth of real output in a developing economy? (b) What causes inflation in a developing economy? By providing the answers, then some of the major economic problems of underdevelopment can be better understood. Because the problem of growth and that of inflation are very central to the process of economic development.

Before we continue, we need to understand two basic characteristics of a developing economy, which directly influence its growth and its rate of inflation. The first characteristic deals with the existence of structural disequilibrium in a developing economy.

Structural Disequilibrium:

Since in a developing economy, capital, technology and entrepreneurship are in 'limited' supply, and since labor supply is 'unlimited'; then there is a possibility that the marginal product of labor may be less than zero. But, since th~e wage rate is always greater than zero, then a disequilibrium exists between the real output on the one hand; and income on the other hand. The implication of this structural disequilibrium is that income is perpetually increasing faster than real output and, therefore, an increase in the general price level becomes inevitable. As a result, inflation should be seen as a structural characteristic of underdevelopment.

The second characteristic of a developing economy, which is also of relevance to our theory, is the existence of 'hoarding' and 'black market' practices in the developing economies; far greater than in any developed economy. The question is how and why this occurs more frequently in a developing country context than elsewhere.

Hoarding and Black Market:

'Hoarding' and 'black market' are common practices in a developing economy, because future prices are taken into consideration; when present buying and selling decisions are being made. For example, if future prices are expected to be higher, then consumers will tend to buy more at the present price and hoard the goods. Since higher future prices are seen as a sign of supply shortages, then hoarding is a means of assuring supply of the essential commodities, by the consumers.

Whereas, if the seller perceives that future prices will be higher than present prices, then part of the supply is removed from the market awaiting the higher prices. This creates an artificial shortage of supply and, then, the goods will only be sold to the consumer willing to pay the higher prices now, rather than in future. Thereby, a 'black market' is created. Thus, the effect of 'hoarding' and 'black market' is to create artificial shortages of essential commodities and to drive prices up. This reinforces the inflationary pressure in a developing economy. Therefore, buying in a developing economy is not only transactional but also precautionary. Then, of course, this will have an implication for the consumption function for a developing economy; because anticipated future prices have an effect upon present consumption. Whereby any anticipated increase in the future prices causes the marginal prospensity to consume to increase in the present period, in a developing economy.

In order to determine the effect of inflation on the growth of real output in a developing economy, let us begin by assuming that the production function is given as:

Eq.l $\quad Y(t) = f[\, L(t)\,]$

where Y = real output, L = labor and t = time measured in year. This production function assumes that labor is the only variable input while other inputs remain fixed. Then, from this function let us define that:

Eq.2 $$\frac{d\,Y(t)}{d\,L(t)} = MP(t)$$

where MP = marginal product of labor and, d = change. Now if we assume that the marginal product of labor is equal to the real wage, then it can be stated that:

Eq.3 $$MP(t) = \frac{W(t)}{P(t)}$$

where W = wage rate and P = general price level. Then by substitution of Eq.3 into Eq.2, it can now be stated that:

Eq.4 $$\frac{d\,Y(t)}{d\,L(t)} = \frac{W(t)}{P(t)}$$ which implies that:

Eq. 5 $$P(t).[d\ Y(t)] = W(t).[d\,L(t)]$$

Eq.5 states that, at equilibrium, the marginal revenue will be equal to the marginal cost. Given this, then the change in real output can be defined as:

Eq.6 $$d\,Y(t) = \frac{W(t).[d\,L(t)]}{P(t)}$$

The last equation shows that any increase in the general price level will lead to a decrease in real output. Therefore, inflation retards economic growth in a developing economy. This confirms the empirical finding in Section 2 of this paper.

So far, we have analyzed the output and employment market to determine the relationship between the growth in real output and that of prices. Now, we shall look at the consumption and money markets to determine the causes of inflation. In order to do that, let us begin by assuming that an equilibrium expenditure exists. Given this,then it can be stated that:

Eq. 7 $Y(t) = C(t) + I(t)$

where C = real consumption, I = real investment, and all other variables remain as defined already. Since from Eq. 7 above, it can be deduced that:

Eq. 8 $d\,Y(t) = d\,C(t) + d\,I(t)$

and by dividing both sides of Eq. 8 by d Y(t) we get:

Eq. 9 $$\frac{d\,Y(t)}{d\,Y(t)} = \frac{d\,C(t)}{d\,Y(t)} + \frac{d\,I(t)}{d\,Y(t)}$$

which will yield the result that:

Eq. 10 $$1 = \frac{d\,C(t)}{d\,Y(t)} + \frac{d\,I(t)}{d\,Y(t)}$$

Now let: $$\frac{d\,C(t)}{d\,Y(t)} = u(t)$$

which is the marginal prospensity to consume.

Also let: $$\frac{d\,I(t)}{d\,Y(t)} = v(t)$$

which is the marginal prospensity to invest. Then, it can now be stated, on the basis of Eq. 10, that:

Eq.11 $u(t) + v(t) = 1$

Now, let us asssume that the consumption function is given as:

$W(t).L(t)$

$$\text{Eq. 12} \quad C(t) = u(t) \quad \frac{\quad}{P(t+l)}$$

which states that real consumption is determined by the marginal prospensity to consume and the real total wage bill. Since the wage rate (W) multiplied by the labor force (L) represents the total wage bill in the economy, and also since in a developing economy, profit, dividend, rent and royalty are very insignificant, then the total wage bill approximates the national income. However, we see that in Eq.12 above, the anticipated future price level is what influence the present level of consumption. This is because of the effect of precautionary consumption, which has already been explained above.

If the total wage bill is fixed in the present time, then any anticipated increase in the future price level will increase the marginal prospensity to consume; in order to maintain the same level of consumption. Otherwise, this will be the reason why the pressure on wage increases is so great in the developing economies. Naturally, the real total wage bill as shown in Eq. 12 above, must be equal to the real output. The reason for this is as follow. Let the investment function be given as:

$$\text{Eq. 13} \quad I(t) = v(t).Y(t)$$

then by substituting Eq. 12 and Eq. 13 into Eq. 7 we can state that:

$$\text{Eq. 14} \quad Y(t) = u(t).\frac{W(t).L(t)}{P(t+l)} + v(t).Y(t)$$

whereby:

$$\text{Eq. 15} \quad Y(t) = \frac{u(t).\dfrac{W(t).L(t)}{P(t+l)}}{1 - v(t)}$$

From Eq. 11 above, since u(t) + v(t) = 1, and since u(t) = 1 - v(t), then Eq. 15 becomes:

$$\text{Eq. 16} \quad Y(t) = \frac{W(t).L(t)}{P(t+l)}$$

which shows that the real wage bill, discounted by th**e** expected future price level, must be equal to the present real output. Therefore, if real output is not increasing, then the discounted real wage can not increase either. As a result, any anticipated increase in the future price level can only manifest itself through an increase in the marginal prospensity to consume; as shown in Eq. 12 above. The implication is that the marginal prospensity to consume becomes the psychological variable through which the sociopatic effect of inflation is played out.

For a moment, let us assume that the supply of money is equal to the demand for money. Then it can be stated that:

$$M(t) = p(t).Y(t)$$

where M = the supply of money, and then by deduction from the above equation, it can now be stated that:

$$\text{Eq. 17} \quad Y(t) = \frac{M(t)}{p(t)}$$

Now, if we equate Eq. 16 with Eq. 17, since Y(t) is common to both equations, then we can state that:

$$\text{Eq. 18} \quad \frac{M(t)}{p(t)} = \frac{W(t).L(t)}{p(t+l)}$$

that is:

$$\text{Eq. 19} \quad p(t) = \frac{p(t+l).[\,M(t)]}{W(t).L(t)}$$

Now, according to the result we have derived from Eq. 19 above, if the total wage bill happens to be equal to the supply of money; then there will be no inflation. Because, in that case p(t) = p(t+l). Hence, prices remain unchanged and inflation has not occurred. However, in a money is never targetted to the equilibrium demand developing economy, the supply of for money. To the extent that money supply always increase faster than the wage bill, then general price level will always increase.

Another way to look at this is that money is needed to pay the wage bill. Therefore, it is certain that the wage bill can never be greater than the supply of money. Then since the existence of a balance between the two is also very doubtful, the only possibility is for the supply of money to be greater than the wage bill. Now, we see that the excessiveness of money supply over the wage bill and/or an increase in the anticipated future price level which will increase the marginal prospensity to consume are the causes of inflation in a developing economy.

The process of inflation in a developing economy is therefore that, an excessive increase in the money supply leads to an increase yin the general price level. This in turn leads to a fall in the real wage and hence in the marginal productivity of labor. That will then lead to a fall in real output and also to a further increase in the general price level. This will then create the pressure for an increase in the nominal wage, which in turn leads to further increase in money supply. Hence the process repeats itself.

Whereas, an anticipated increase in the future general price level will increase the marginal prospensity to consume. Therefore, the marginal prospensity to invest will go down and growth of real output will slow down. This will lead to an increase in the current price level which then reinforces the expectation of higher prices in the future. Then the process via the psychology of inflation also repeats itself in reinforcing the negative impact of inflation and thus leading to further inflation.

Now that we understand properly the causes and effects of inflation, let us use our theory to analyze the Nigerian experience in the 1970's. We will like to know why all the government policies failed to control inflation.

5. Conclusions and Recommendations

First, the supply of money increased in Nigeria by about 300% between 1970-1976. This was an average annual increase of about 43%. The reason why money supply had to increase by this much was the huge wage increases granted to almost all workers in the country, irrespective of productivity. Since in the same period the gross domestic product only increased by an annual average rate of 9%, then this would suggest that the supply of money was higher than warranted by the real demand for money; which was the real output. Therefore, this excessive supply of money led to an increase in the general price level. Then as the government efforts failed to bring prices down immediately, the psychological effect set in. The people anticipated future increases in prices. Therefore, 'hoarding' and 'black market' set in. This then increased the marginal prospensity to consume which increased inflation further. The process has never stopped since.

Inevitably, the growth in real output fell from about 18 percent in 1971 to below 10 percent for many years thereafter. Morever, although the leading sector, i.e., oil, was growing, but agriculture was declining and manufacturing grew very little. Since the money supply continued to increase, then it was no surprise that inflation never came down, despite all of the efforts to control it.

Since all these happened as Nigeria was being subjected to greater centralized planning and greater government control, then the question is what should have been done by the planners? The answer would come from the result of Eq. 19 above. Noting that the supply of money was the most powerful instrument of control**,** and noting that it was totally misused; then the appropriate determination of its quantity would be very beneficial to many developing countries.

From Eq. 19, we can now determine that the supply of money is given as:

Eq. 20 $$M(t) = \frac{p(t)}{p(t+l)} . [\, w(t).L(t)]$$

This dictates that the estimate of inflation rate for next year should have an influence on this year's money supply. If inflation is predicted, which means that next year's price level will be greater than this year's, then the supply money can only be a fraction of the wage bill. The implication is that the country can not support that level of wage bill and that the wage bill must have to come down. Whereas, in a period of price stability when next year's price level may be equal this year's, then the level of money supply should be equal to the wage bill.

The major lesson here is that reckless increases in the supply of money without due regard for the absorptive capacity of the economy will always lead to inflation. Then, inflation retards economic growth and can only negate the development efforts of the country. Then the frustration experienced by the population become a breeding ground for chaos. It is hoped that many developing countries will learn from this lesson, and will respond more to the market signals rather than trying to control it.

References

1. Campos, R.O., "Two Views on Inflation in Latin America ", in *Latin American Issues*, edited by A.O. Hirschman, New York, 1961
2. Dorrance, G.S., "The Effect of Inflation o*n* Economic Development", *International Monetary Fund Staff Papers*, March 1963
3. Nigeria-Central Bank, *Economic and Financial Review*, Vol. 14, - No. 2, June 1976
4. Nigeria-Federal Ministxy of Informatio*n, Economic and Statistical Review, 1976,* Lagos
5. Nigeria-Federal Office of Statistics, *Economic Indicators*, September 1976, Lagos
6. Nigeria-Federal Office of Statistics, *National Accounts of Nigeria, 1970-76,* Lagos, December 1977
7. Nigeria-Central Planning office, *Third National Development Plan: 1975-80*; April 1975, Lagos
8. Nigeria.-Central Planning office, *First Progress Report to the Third National Development Plan*, 1977, Lagos.