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**INFLATION, UNEMPLOYMENT AND NIGERIAN FAMILIES:
AN EMPIRICAL INVESTIGATION**

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ABSTRACT

At present, the world economy is at a cross road. The Nigerian economy is therefore undergoing its most severe economic crisis since the Biafra war of the sixties. Currently, she is experiencing a staggering rate of inflation (well up to the double digit) as well as experiencing a severe recession (as the unemployment rate has risen astronomically). Consequently, a basic thesis of this proposal is that stagflation has caused and will continue to cause considerable hardship for many Nigerian families and poses a serious threat to the mental health of a substantial proportion of the population. It is therefore the aim of this research to document in a systematic way how families that have experienced varying degrees of “inflation crunch” have adjusted to or tried to adapt to this pressure. In other words, this phased research project proposes to provide information that will be useful to policy makers (government) who must weigh the costs and benefits of the current inflationary pressures as well as severe recession. Essentially, the result will be an emergence and evolution of corrective policy measures and strategies (as adequate and functional).

KEY WORDS: Inflation, unemployment, stagflation, inflation crunch, Nigeria, economy, world, depression, recession, targeting, Phillips curve, monetary policy, rational expectations, Keynesian theory, new classical, wages, prices, nairu

JEL NO: D10 C80, C90, J60 , J30, E34

1.0 BACKGROUND AND PROBLEM STATEMENT

Indeed, the Nigeria economy is now undergoing its most severe economic crisis since the Biafra Civil War of the sixties. In other words, as the biggest recession in seventy years continues to undermine political support for globalization and threaten the income of more families globally, its negative implications for Nigerians' economy now appear to be incontestable. That is, if there were to be significant slowdowns in the economic activity of the United States of America, they will be buying less crude oil; and if they buy less crude oil, crude oil prices will crash and consequently, the Nigerian budget will collapse. Right now, the country appears stuck with the various offshoots of the crisis (such as shrinking private inflows, weakening naira, nose-diving foreign reserves, reduced revenue due to plummeting oil prices, and hyperinflation). For example, a market observation revealed that an Ewedu seller who offered a smaller than usual bunch for fifty naira, linked the increase in price to an appreciating dollar. Here, the puzzle is that whether the global food crisis had also forced farmers to import vegetables in dollars. Yet, the exploration is that if the dollar rises, a vegetable seller in Nigeria who must spare on inevitable daily needs (most of which are imported) incur extra expenses. Consequently, the only way to meet up with the financial implications of these added costs is to align the price of her Ewedu with global reality, even in a situation where the environment favors cheap production.

Specifically, Nigeria is currently experiencing a staggering rate of inflation, well up into the double digits. At the same time, contrary to all economic theory, she is experiencing a severe recession, as the unemployment rate has risen above single digit and the gross national product has steadily declined which are symptoms of a recession that might well much room into a full-scale depression. Thus, this double bird of rampant inflation and recession can be professionally regarded as stagflation or slumpflation. Just as the great depression was a worldwide phenomenon, so the current rampant inflation is devastating all the major countries of the world. Therefore, economists have diagnosed the current inflationary trend as both "demand-pull" inflation in which consumer demand far exceeds the supply of

goods and services (that is, too much money pursuing too few goods) and as “cost push” inflation in which rising costs of labor push prices even higher. Yet, the general consensus is that both of these forces are now at work, reinforcing each other in an ever upward spiral of prices. Underlying these inflationary pressures are decidedly new features of the world economy, such as the energy crisis and the general scarcity of essential resources. Thus, the consensus of most scholars is that the current inflation (with or without recession) is a long-range phenomenon not likely to recede in the near future. In fact, we may be on the verge of a new society (one in which inflation is endemic to our way of life); and in a variety of circles, the alarm has been raised that hyperinflation can lead to the downfall of our democratic society. However, Central Bank of Nigeria (2007) observed that inflationary pressure remained largely subdued in 2007 and the single digit target rate was sustained two years in a row. At six point six percents the year – on – year inflation rate was one point nine percentage point below the eight point five percent recorded in 2006. Here, the favorable inflationary development was underpinned by relative good agricultural harvest despite the mild drought and flooding experienced in certain parts of the country; stability in the prices and supply of petroleum products; sound macroeconomic policies (such as monetary and fiscal policies) as well as the substantial appreciation of the naira exchange rate. Similarly, the headline inflation was driven largely by the housing, water, electricity, gas and other fuel components of the consumer price index, which contributed about four point four percentage points to the observed inflation rate. More recently, the international labor organization (I.L.O) reported that global job losses worldwide could hit fifty –one million by the end of 2009 as a result of the economic slowdown believed to be degenerating into a global unemployment crisis. Under the present economic downturn that is currently ravaging the world, ILO reported that 2009 would finish with more unemployed peoples than at the end of 2007 during which the global unemployment rate was single digit. Unfortunately, we are now facing a global jobs crisis and progress in poverty reduction is unraveling and middle classes worldwide are weakening. Thus, the political and security implications are daunting. Here, the ILO prediction is that the crisis could also push another two hundred million workers into extreme poverty as they are faced with the grim reality of being forced out of a living in informal, underpaid and instable work situation (such as in south Asia and Africa). Beyond the fifty- one million people that will be directly affected by the global job losses, a number of people that depend on them will also be affected indirectly. For example, an average worker has about five dependants and those in the Diasporas who normally remit money home will be equally affected. It could also lead to high crime rate and prostitution by young females. It will also increase the rate of drug trafficking as well as money laundering. Again, it would encourage discipline from children of parents that are directly affected, as standards of living will also fall as those affected can no longer pay for the things of interest.

Consequently, governments have to do something urgent to ameliorate the situation as the situation at hand is not a child’s play. And whether the above apocalyptic events will ever come to pass, it is clear that rampant inflation now joined by a dangerous recession has already had a dramatic impact on the way of life of many Nigerians. In other words, whether the rampant inflation or widespread unemployment is the major problem at the time the proposed study is carried out remains to be seen. In either event, families in all walks of life will have been touched by these economic conditions and the pressures will be so great that their very

survival will be threatened. Therefore, the basic thesis's (thrust) of this proposal is that stagflation has caused and will continue to cause considerable hardship for many American families and poses a serious threat to the mental health of a substantial proportion of the population.

2.0 OBJECTIVES AND HYPOTHESIS STATEMENT

Here, two fundamental and interrelated objectives exist.

1. Through a household survey, we plan to identify those segments of the population which have been most hurt by inflation as well as those which have managed to escape the ravages of inflation. In other words, we plan to measure "inflation crunch" (The degree to which a family has been hurt by inflation) in both objective and subjective terms. Here, as the sampling plan indicates, particular attention will be paid to the two groups widely assumed to suffer most from inflation (retired who live on fixed incomes and the poor).
2. To document in a systematic way how families that have experienced varying degrees of 'inflation crunch' have adjusted to or tried to adapt to this pressure. In other words, to examine the way in which their life styles have changed; the coping strategies that have evolved and the inflation impact on family structure, marriages, mental health and basic value orientations.
3. To provide information that will be useful to policymakers who must weigh the costs and benefits of the current inflationary pressures in contrast to a severe recession.
4. To execute research that documents the trends that are developing in the Nigerian way of life in response to hyperinflation. Here, these trends are likely to have repercussions for all the major institutions of our society (from the occupational world, to higher education, to leisure time activities, to the functioning of Local Government, to the organization of the family).

5. And to conduct a careful study of the impact of inflation on Nigerian families that will provide valuable insights into the future direction of the Nigerian society which, in turn, will be of value to policymakers, technocrats and politicians.

3.0 THEORETICAL (EMPIRICAL) LITERATURE

The small country monetarist models predict that under a fixed exchange rate, changes in the money supply will be completely offset by variations in foreign reserves, restoring the original money supply. This result was derived from the monetary equilibrium condition, along with the assumption of exogenous income (at potential output), prices (due to purchasing power parity) and interest rates (assuming perfect capital mobility). However, models with less restrictive assumptions (such as when resources are not fully employed) imply a balance of payments offsets that may be smaller. And yet, under a flexible exchange rate, monetarists models predict the exchange rate and prices will adjust completely to changes in money, leaving real variables unchanged. In contrast the Keynesians opposed the monetarists' view of direct and proportional relationship between the quantity of money and prices. Here, the Keynesians school postulates that the relationship between changes "in the quantity of money and prices is non-proportional and indirect through the rate of interest. Essentially, the Keynesians theory examined the relationship between the quantity of money and prices both under unemployment and full employment situations. In other words, so long as there is unemployment output and employment will change in the same proportion as the quantity of money (with no change in prices). Unfortunately, the theory fails to appreciate the true nature of money and assume that money could be exchanged for bonds only.

In response to the weaknesses of Keynesian theory, the new- Keynesian theoretical exposition combines both aggregate demand and aggregate supply by assuming Keynesian short run view as well as classical long-run in view. Here, they maintained that inflation depends on the level of potential output or the natural rate of unemployment or **NAIRU** (non- accelerating inflation rate of unemployment). However, the exact level of potential output or natural rate of unemployment is generally unknown and tends to change over time. In a comparative development, the trade-off between inflation and unemployment is described as the Phillips (1958)

curve. This was an empirical discovery that showed an inverse relationship between wage and unemployment rates, using the United Kingdom data (1862- 1957). Specifically, the relevance of the Phillips curve was that it captured an economically important and statistically reliable empirical relationship between unemployment and inflation. However, a major critique is that it does not take into account the interactions in the underlying or structural behavior of consumers and firms in the economy. Rather, it captures empirical regularities between unemployment and inflation rates based purely on correlations in historical data.

Thus, following Muth's definition (1961) expectations are said to be rational when they are essentially the same as the predictions of the forms economic theory. Here, the public forms unbiased predictions of an event conditional on the information available when the expectations are formed. This includes the policies of the central bank and thus the public eventually learns the monetary authority's systematic response to economic data; and therefore is able to form unbiased estimates of future values of monetary instruments. However, the policy ineffectiveness proposition of the new classical school states that only unanticipated changes in the money supply affect real variables such as the unemployment rate or the level of output. Although much empirical research has been undertaken for various countries using different data and sample periods; the most revealing interchange took place between Rush and Waldo (1988) and Pesaran (1988). Here, Pesaran (1982) produced a variable non-nested Keynesian (or activist) model of unemployment which rejected Barro's (1977) model without itself being rejected by the new classical model. However, Rush and Waldo (1988) argued that Pesaran's (1982) version of the New classical model could be improved by taking account of the fact that when it is known that war is over, the public will anticipate a reduction in government spending. In other words, they argued that the Keynesian model proposed by Pesaran (1982) could be rejected in favor of their improved New classical model. Unfortunately, Rush and Waldo's argument was easily overturned when Pesaran (1988) used the same argument to improve the Keynesian model (that was found to be empirically superior to the improved new classical model).

Using a different methodology De Bruwer and Ericsson (1995) developed an error correction model (ECM) for inflation in Australia. Their results showed that the structure of the inflationary process in Australia did not appear to have changed. Similarly, Stock and Watson (1999) used the conventional Phillips Curve (unemployment rate) to investigate forecasts of the United States inflation at the twelve-month horizon. Specifically, they found that inflation forecasts produced by the Phillips Curve generally had been more accurate than forecasts based on other macro economic variables, including interest rates, money and commodity prices but relying on it to the exclusion of other forecasts was perhaps, a mistake. Again Lim and Papi (1997) studied the determinants of inflation in Turkey by analyzing price determination within the framework of a multi-sector macro economic model (1970-1995). By incorporating both long and short run dynamics comprising the goods, money, Labor and external sectors, they concluded that policy makers' commitment to active exchange rate depreciation on several occasions of the past fifteen years had also contributed to the inflationary process. Callen and Chugh (1999) modeling study revealed that Reserve Bank of India had shifted from broad money target toward a multiple indicator approach in the conduct of monetary policy. Their findings indicated that exchange rate and import prices were relevant for inflation and that

developments in the monetary aggregates remain an important indicator of future, inflation. Aron and Muellbauer (2000) examined multi- step models for inflation and output (four- quarters ahead for South Africa). Their model result confirmed the importance of the output gap and the exchange rate for forecasting inflation. Using a parsimonious and empirically stable error- correction model, Williams and Adedeji (2004) found that the major determinants of inflation were changes in monetary aggregates, real output, foreign inflation and the exchange rate. Similarly, sun (2004) selected a parsimonies specification of an unrestricted model of Thailand's core inflation, and this was done following the general to specific methodology and the result was a promising model for forecasting Thai Core inflation over different horizons. However, Khan and Schimmelpfeining (2006) showed that monetary factors were the main drivers of inflation while "Wheat support price" affects inflation in the short run (as regards Pakistan). Here, their conclusion was that Wheat support price mattered for inflation over the medium term; and that a long run relationship existed between the consumer price index and private sector credit.

Regionally, in Africa, Chibber et. al (1989) employed a highly disaggregated econometric model for Zimbabwe and found that monetary growth, foreign prices, exchange rates, interest rates, unit labor cost and real output are the key determinants of inflation in that country. Sowa and Kwaye (1993) conducted that the inflation problem is a multifaceted issue with many causes in Ghana. Barungi (1997) examined the determinants of inflation in Uganda and concluded that inflation was indeed a monetary Phenomenon. Kilindo (1997) tried to increase the understanding of Tanzanian inflation by investigating the links among fiscal operations money supply and inflation. Similarly Duravell and Dung' (1999) analyzed the dynamics of inflation in Kenya and found exchange rate, foreign prices and terms of trade as having long- run effects on inflation, while money supply and interest rate only had short run effects. In a related study for Mozambique, Ulbide (1997) showed that rate of inflation was determined by a combination of economic factors, sensorial behavior and a collection of irregular events, corresponding mainly to agro climatic conditions.

In Nigeria, Oyejide (1972) examined the impact of deficit financing in propagating inflation processes in Nigeria and concluded the existence of direct relationship between inflation and the various measures of deficit financing for the period studied. However, Ajayi and Awosika (1980) found that inflation in Nigeria is explained more by external factors (such as international oil market fortunes) in contrast to internal influences. Yet, Adedeji and Fakiyesi (1980) estimated and tested the hypothesis that the main factor responsible for instability of prices and inflationary tendencies was the Nigerian government expenditure. And using quarterly data, Osakwe (1983) identified the money wage rate and money supply as the two most important of prices during the period. Again, using cointegration and error correction Mechanism, Egwaikhide et. al (1994) conducted that Nigerian inflation seems to find explanation in both monetary and structural factors and that both the official and the parallel market exchange rates exert upward pressure on the general price level. Furthermore, Ajakaiye and Ojowu (1994) using an input –output price- model, simulated and analyze empirically the impact of exchange rate depreciation under different make up regimes. They found that although exchange rate depreciation under the universal flexible mark- up pricing regime with rational expectation will contributed reasonably to the changes in the structure of sectoral prices, the associated inflationary consequences are the highest. In order to explain

the dynamics of inflation and forecast its future path, central Bank of Nigeria (2007) explores several models (based on whether or not inflation arises from monetary or real variables) and to mimic the observed time series nature of inflation. Here, they concluded that Trend has a significant positive relationship with core and headline inflation while food inflation shows significant seasonal variations.

On the other hand, the Phillips curve model performs well in explaining and forecasting inflation and it is best in its disaggregated form. However, Olubusoye and Oyaromade (2008) analyses the main sources of fluctuation in inflation in Nigeria using the framework of error correction mechanism, it was found that lagged consumer price index (CPI), expected inflation, petroleum prices and real exchange rate significantly propagate the dynamics of inflationary process in Nigeria. This paper concluded that efforts of the monetary regulating authorities to stabilize the domestic prices would continuously be disrupted by volatility in the international price of crude oil.

Against the background of high and variable inflation accompanied by extremely low growth, the New Zealand authorities (in 1988) commenced the search for a monetary policy framework in which the policy objective was well defined and the central bank (Reserve bank) of New Zealand or the governor could be held explicitly accountable for achieving that objective. Consequently, (in 1989) the Reserve Bank of New Zealand backed by law adopted inflation targeting (IT) as its preferred monetary policy framework. By 1999, fifteen countries had joined the league of inflation targetors. And apart from Spain and Finland, there has been no case of retreat or switching onto another framework by any of the countries that have adopted inflation targeting as the framework for the conduct and evaluation of monetary policy. Instead the number of formal inflation targeting countries has increased to twenty (by 2002). Since then more Countries have joined and this include Ghana in 2004. Definitional, inflation targeting is an exercise of constrained discretion” (Bernake and Mishkin, 1997).

Here, the constraint is always the inflation target while the discretion is the inbuilt flexibility that offers decision makers some allowance to take account of short run considerations. In otherwords, it can be described as a framework in which the primary goal of monetary policy is to achieve price stability in the form of an inflation target, but it is recognized that some weight should be given to stabilizing the business cycle and consequently, stabilizing output movements around potential output .The three types of inflation targeting are full- fledged inflation targeting (F. F. I. T). Eclectic inflation targeting (E. I. T); and inflation targeting lite (I. T. L). Under inflation targeting, the monetary authority has its primary objective the achievement of an explicit numerical target for inflation, with other objectives (such as low unemployment level and high rate economic growth) being subordinate to it.

Essentially, inflation targeting entails five main elements: The public announcement of medium –term numerical target(s) for inflation, institutional commitment to price stability as the primary goal of monetary policy (to which other goals are subordinated; an information inclusive strategy in which manly variables and not just monetary aggregates or the exchange rate, are used to decide the setting of policy instruments; increased transparency of the monetary policy strategy through communication with the public and the markets about the plans, objectives, and decision of the monetary authorities; and increased accountability of the central bank for attaining its inflation objectives. Under this framework, the central bank must

make the inflation target its overriding objective and as such work to contain IT within the target range anytime inflation threatens to exceed the permissible range. Consequently, to adopt an effective inflation targeting system, an enabling legal instrument that empowers the central bank with the appropriate degree of independence is required. In practice, inflation targeting countries use the output gap as the key predictor for inflation. However, this has been critiqued and evidence has shown that output gap may be useful in explaining changes in inflation. It seems to be an inappropriate predictor for the level of inflation when the current account becomes a dominant determinant of aggregate demand. This is due to the fact that under the conventional IT framework, the central bank is concerned with maintaining internal price stability and keeping growth in demand for non-tradable goods.

On the stagflationary literature, it was in the 1920s that an American economist (Irving Fisher) noted the famous Phillips curve relationship. However, Phillips (1958) in his paper describes how he observed an inverse relationship between money wage changes and the unemployment in the British economy over the period 1861- 1957. Yet, similar patterns were found in other countries. Consequently, in 1960 Paul Samuelson and Robert Solow took Phillips' work and made explicit the link between inflation and unemployment (that is, when inflation was high, unemployment was low and vice versa). During this period a leftward monetary along the Phillips curve described the path of the United States economy unfortunately, in the 1970s, many countries experienced high levels of both inflation and unemployment (known as stagflation). Here, theories based on the Phillips curve suggested that this could not happen and the curve came under concerted attack from a group of economists headed by Milton Friedman (arguing that the demonstrable failure of the relationship demanded a return to non-interventionist, free market policies). Thereafter, new theories such as rational expectations and the non-accelerating inflation rate of unemployment (NAIRU) arose to explain how stagflation could occur. NAIRU or natural rate of unemployment distinguished between the "short term" Phillips curve and the long term" Phillips curve. Here, the short-term Phillips curve looked like in the normally Phillips curve, but shifted in the long run as expectations changed. But in the long run, only a single rate of unemployment (NAIRU or "natural rate") was consistent with a stable inflation rate. Thus, the long-run Phillips curve was vertical, and so there was no trade-off between inflation and unemployment (as proposed by Edmund Phelps, the 2006 Economics Nobel prize winner).

Indeed, the long-run Phillips curve is the vertical line and the NAIRU theory states that when unemployment is at the rate defined by this line, inflation will be stable. However, in the short-run policy makers will face an inflation-unemployment rate trade off (called 'initial short-run Phillips curve'). Policy makers can therefore reduce the unemployment rate temporarily, moving from lower point to higher point through expansionary policy. However, NAIRU states that exploiting this short-run trade off will raise inflation expectations, shifting the short-run curve rightward to the "New Short-Run Phillips Curve" and moving the point of equilibrium from the last point to another-outward point. Thus the reduction in unemployment below the 'Natural Rate' will be temporary and lead only to higher inflation in the long run.

Since the short-run curve shifts outward due to the attempt to reduce unemployment the expansionary policy ultimately worsens the exploitable trade off

between unemployment and inflation. In other words, it results in more inflation at each short-run unemployment rate. Here, “NAIRU” arises because with actual unemployment below it, inflation accelerates, while with unemployment above it inflation decelerates. With the actual rate equal to it, inflation is stable (neither accelerating nor decelerating).

From a different school of thought, the rational expectations theory (RATEx) said that expectations of inflation were equal to what actually happened (with some minor and temporary errors). Therefore, this suggested that short-run period was so short that it was non-existent. That is, any effort to reduce unemployment below the NAIRU would immediately cause inflationary expectations to rise and thus imply that the policy would fail. In fact, unemployment would never deviate from the NAIRU except due to random and transitory mistakes in developing expectations about future inflation rates.

Consequently, any deviation of the actual unemployment rate from the NAIRU was as illusion. Yet, the ‘short-run Phillips curve is also called the expectation augmented Phillips curve’ since it shifts up when inflationary expectations rise. In the long run, this implies that monetary policy cannot affect unemployment, which adjusted back to its “natural rate: (NAIRU or long-run Phillips curve). However, this long-run “neutrality” of monetary policy does allow for short-run fluctuations and the ability of the monetary authority to temporarily decrease unemployment by increasing permanent inflation and vice versa. Again, an equation like the expectations augmented Phillips curve also appears in new Keynesian dynamic stochastic general equilibrium model. In these models with sticky prices there is a positive relation between the rate of inflation and the level of demand, and therefore a negative relation between the rate of inflation and the rate of unemployment. This relationship is often called the new Keynesian Phillips curve and like the curve; the new Keynesian Phillips curve implies that increased inflation can lower unemployment temporarily, but cannot lower it permanently.

Indeed, the original Phillips curve literature was not based on the unaided application of economic theory. In other words, the Phillips curve started as an empirical observation in search of a theoretical explanation. Specifically, this curve tried to determine whether the inflation- unemployment link was causal or correlational. After that economists tried to develop theories that fit the data thus, the traditional Phillips curve story starts with a wage Phillips curve that describes the rate of growth of money wages (gw). Here the operator g is the equivalent of “the percentage rate of growth of “the variable that follows:

$$gW = gW^t - f(u) \quad (3.1)$$

The “money wage rate” (W) represents the total money wage costs per production employee (including benefits and payroll taxes). However, the focus is on only production workers’ money wages because of the fact that these costs are crucial to pricing decisions by the firms. Equation (3.1) tells us that the growth of money wages rises with the target rate of growth of money wages (T) and falls with the unemployment rate (U) The function f() is assumed to be monotonically increasing with **U** so that the dampening of money- wage increases by unemployment is shown by the negative sign in the above equation. It is important to note here that money

wages are set by bilateral negotiations under partial bilateral monopoly: as the unemployment rate rises, all else constant workers bargaining power falls, so that workers are less able to increase their wages in the face of employer resistance.

During the 1970s, this story had to be modified, because workers try to keep up with inflation. Since the 1970s, the equation has been changed to introduce the role of inflationary expectations (or the expected inflation rate, ${}_g p^{ex}$). Consequently, expectations augmented wage Phillips Curve is produced:

$${}_g w = {}_g w^t - f(U) + \lambda {}_g p^{ex} \quad (3.2).$$

This introduction of inflationary expectations into the equation implies that actual inflation can feed back into inflationary expectation and thus cause further inflation. James Tobin tagged the last term “inflationary inertia”, because in the current period, inflation exists which represents an inflationary impulse left over from the past. It is also involved much more than expectations, including the price –wage spiral. In this spiral, employers try to protect profits by raising their prices and employees try to keep up with inflation to protect their real wages. In fact, this process can feed on itself, becoming a self-fulfilling prophecy. Here, the parameter λ (which is presumed constant during any time period) represents the degree to which employees can gain money wage increases to keep up with expected inflation preventing a full in expected real wages; and it is usually assumed that this parameter equals unity in the long run. In addition the function $f(\cdot)$ can be modified to introduce the idea of Non- Accelerating inflation Rate of Unemployment (NAIRU) or Natural rate of unemployment or inflation threshold unemployment rate:

$${}_g w = {}_g w^t - f(U - U^*) + \lambda {}_g p^{ex} \quad (3.3)$$

Here, U^* is the NAIRU and if $U > U^*$, inflation tried to accelerate. On the other hand, if $U < U^*$, inflation tried to show. It is assumed that $f(0) = 0$, so that when $U = U^*$ the f term drops out of the equation. In equation (3.3), the roles of ${}_g w^t$ and ${}_g p^{ex}$ seem to be redundant, playing much the same role. However, assuming that λ is equal to unity, it can be seen that they are not. Again, if the trend rates of growth of money wages equal zero, then the case where u equals U^* implies that ${}_g w$ equals expected inflation. That is, expected real wages are constant. However, in any reasonable economy, having constant expected real wages could only be consistent with actual real wages that are constant over the long haul. Yet, an alternative assumption is that the trend rate of growth of money wages equals the trend rate of growth of average labor productivity (Z). That is,

$${}_g w^t = {}_g z^t \quad (3.4)$$

Under assumption (3.4), when U equals U^* and λ equals unity, expected real wages would increase with labor productivity. This would basically be consistent with an economy in which actual wages increase with labor productivity. Thus, deviations of real-wage trend from those of labor productivity might explained by reference to their variables in the model.

For the price behavior, the standard assumption is that markets are imperfectly competitive, where most businesses have some power to set prices. So

the model assumes that the average business sets prices as a mark- up (M) over unit labor costs in production measured at a standard rate of capacity utilization and the add in unit material costs. Here the standardization involves ignoring deviations from the trend in labor productivity and assuming that the growth of labor productivity is the same as that in the trend and that current productivity equals its trend value:

$$g_z = g_z^T \text{ and } Z=Z^T \quad (3.5)$$

The make-up reflects both the firm's degree of market power and the extent to which overhead costs have to be paid. In other words, Ceteris Paribus, M rises with the firm's power to set prices or with a rise of overhead costs relative to total costs.

Therefore, pricing follows this equation $P = M \times (\text{unit labor costs}) \times (\text{unit materials costs})$

$$= M \times (\text{Total production employment cost}) / (\text{quantity of output}) + \text{UMC} \quad (3.6)$$

UMC is unit raw materials cost (total raw materials costs divided by total output). So the equation can be restated as:

$$P = m \times (\text{production employment cost per worker}) / (\text{output per production employment}) + \text{UMC} \quad (3.7)$$

$$\begin{aligned} \text{OR } P &= M \times (\text{average money wage}) / (\text{production Labor productivity}) + \text{Umc} \\ &= M + (W/z) + \text{UMC} \end{aligned} \quad (3.8)$$

Now, assume that the average price/ Cost Markup (M) and UMC are constant; as well as the assumption that Labor productivity grows, as before. Thus, an equation determining the price inflation rate (g_p) is:

$$g_p = g_w - g_z^T \quad (3.9)$$

Then, combined with the wage Phillips curve (3.3) and the assumption made above about the trend behavior of money wages (3.4); this price- inflation equation arises as a simple expectations augmented price Phillips Curve:

$$g_p = -f(U - U^*) + \lambda \cdot g_p^{\text{ex}} \quad (3.10)$$

Here, we may assume that we can simply add in g^{UMC} (rate of growth of UMC) in order to represent the role of supply shocks. This therefore produces a standard short-term Phillips Curve:

$$g_p = -f(u - u^*) + \lambda \cdot g_p^{\text{ex}} + g^{\text{UMC}} \quad (3.11)$$

Equation (3.11) is called the "triangle Model" because it explains short-run inflationary behavior by three factors: demand inflation (due to low unemployment), supply- shock inflation (g^{UMC}) and inflationary expectation (or inertial inflation). Yet, in the long run, it is assumed, inflationary expectations catch up with and equal actual inflation so that $g_p = g_p^{\text{ex}}$ (3.11A)

And this represents the long-term equilibrium of expectations adjustment. In fact, part of the adjustment many involve the adaptation of expectations to the experience with actual inflation. Alternatively, it involves guesses made by people in the economy based on other evidence.

Specifically, expectation equilibrium gives us the long term Phillips Curve and with λ less than unity:

$$g_p = \frac{1}{1 - \lambda} \cdot (-f(u - u^*) + g^{UMC}) \quad (3.12)$$

Equation (3.12) is the steeper version of the short-run Phillips Curve inflation rises as unemployment falls, while this connection is strong. That is, a low unemployment rate (less than U^*) will be associated with a higher inflation rate in the long run than in the short-run. This occurs because the actual higher- inflation situation seen in the short-run feeds back to raise inflationary expectations, which in turn raise the inflation rate further.

On the other hand, at high unemployment rates (greater than U^*) lead to low inflation rates; and these in turn encourage lower inflationary expectations, so that inflation itself drops again. However, this logic further if λ is equal to unity, that is, if workers are able to protect their wages completely from expected inflation (even in the short-run). Thus, the triangle model equation becomes

$$-f(u - u^*) = g^{UMC} \quad (3.13)$$

Assuming further (as seems reasonable) that there are no long-term supply shocks, equation (3.13) can be simplified to become:

$$-f(u - u^*) = 0 \quad (3.14A)$$

This implies that

$$U = U^* \quad (3.14B)$$

These assumptions imply that in the long-run there is only one possible unemployment rate, U^* at any one time (called natural rate of unemployment)

4.0 METHODOLOGICAL FRAMEWORK

Indeed, the proposed study encompasses three research strategies: a household survey of 1, 500 families; field work involving case studies of 72 families; and an econometric analysis of inflation-unemployment data for the country as a whole and for a sample of large cities. Perhaps, the household survey is most critical and has four major objectives:

- (a). Identifying the kinds of families that are suffering most from stagflation (that is rampant inflation and unemployment).
- (b). Examining the strategies that families have employed in their efforts to cope with inflation- unemployment strategies that is for the most part involve radical changes in lifestyles;
- (c). Identifying the impact of inflation (recession) on the well- being of families, on the mental health of family member and on basic value orientations of family members and
- (d). Learning how the public interprets the causes of inflation and which critical groups it blames for our economic troubles.

Here, it is, extremely misleading to assume that people in all walks of life are equally affected by the sharp rise in the cost of living over the past several years. Even during the most traumatic economic crisis, a majority of wage earners are able to escape the ravages of unemployment. In fact, not all Nigerians are currently suffering because of high inflation. Partly as a result of cost of living changes in union contracts partial because many professional classes are free to raise the cost of their services, large segments of the population have been able to keep abreast of rampant inflation by raising their incomes, and their styles pf life have not suffered in any material way. On the other hand, equally large, if not larger, segment of the

population have suffered because of the high inflation and stagflation we are now experiencing. Unfortunately, for these families, high inflation has posed a series of difficult choices ranging from finding new sources of income to keep abreast of rising prices to deciding how to lower one's standard of living so as to make ends meet.

Thus, the notion of the impact of inflation on families gives rise to a concept like inflation crunch and therefore a major task of the proposed research will be to measure inflation crunch and identify the families who are experiencing inflation crunch and the families who are managing to avoid it. Basically, inflation crunch are measured in two ways.

- (1). **OBJECTIVE INFLATION CRUNCH** measure the degree to which the family's normal sources of income have failed to keep up with the rise in the cost of living. We intend to know how much the cost of living has rising in each of the sample cities included in the household survey over the two or three year period prior to the survey. We will then find out how much the earnings of the Chief Wage earners have raised during this period. Thus, the ratio of these numbers will serve as the measure of objective inflation crunch. However, in this measurement, we shall be careful to take into account new sources of income stimulated by the inflation, such as the chief wage earner taking on a second job a secondary wage earner entering the labor force during this period. Expansions in family income due to such measurement will be treated as consequences of inflation crunch and will not be included in the measure of objective inflation crunch.
- (2). **SUBJECTIVE INFLATION CRUNCH** measures the degree to which the family feels that it is hurting because of inflation.

The above measurers of inflation crunch will then be related to the various demographic characteristics of the respondents. In this fashion, we shall be able to identify the social groups suffering most from inflation. Essentially, the research plan will insure that the poor and the retired (two groups widely assumed to be hurt hardest by inflation) will be included in the study. Therefore, this study will be able to identify the social groups that are being hurt by inflation and the groups that for whatever reasons are not being hurt.

At the heart of the proposed research is a large- scale sample survey of household. Instead of a national sample of households, we shall limit the survey to six cities of varying degrees of able to study the impact of inflation in the context of high and low unemployment. Here, two high unemployment cities will be selected (tentatively, Owerri and Yenogoa) and two low unemployment cities (tentatively, Ibadan and Makurdi) as well as two cities to represent the middle, range of unemployment (tentatively, Kaduna and Abuja).

Within each city, stratified random samples of 250 families will be selected, for a total of 1, 500 in all six cities. To ensure adequate representation of the groups believed to be hardest hit by inflation (the poor and the retired) within each city, a random sample of 50 poor families and fifty retired persons will be interviewed. The remaining 150 interviews in each city will be split evenly between blue collar and White- collar workers. Thus, the final sample of 1,500 households will consist of 300

poor families, defined as families living in the sampled cities who are earning below the Nigerian minimum wage when the survey will be conducted, 300 retired persons, 450 blue-collar households and 450 white-collar households. Here, the survey of blue-collar and white-collar families, that is, those in which both the husband and wife are residing in the household. The reasons for this is to permit examining the inflation strategies of having additional wage earners go to work and the stresses and strains that inflation may be imposing on marriages. However, the requirement of a complete family will be dropped in the samples of poor and retired persons. Yet, in at least half the cases, the interview will be conducted with the chief wage earner and in the other case with his or her spouse.

The above specified research design means that the city unemployment rate will be a key contextual variable in the analysis. Consequently, we shall be able to assess whether the impact of inflation crunch is the same in the same or different in high and low unemployment cities. It may well be (for example) that the specter of losing a job in a high unemployment community may make those who do not have jobs more ready to accept the deprivations of rampant inflation. And given the above sampling procedures described, it is quite likely that the final sample will contain several hundred or more households in which the chief wage earner has lost his job and thus we shall be able to compare the deprivations and feeling states of the unemployed with the employed who are experiencing severe inflation crunch. Indeed, it is anticipated that this will require about an hour and a half interview employing a standard form questionnaires. This interviewing will be done in collaboration with National bureau of statistics.

However, other research objectives such as the shifting roles of family members as a result of inflation, the possible decline of authority of the chief wage earner within the family, and tensions between spouses cannot be fully studied through a static interview employing a standard form questionnaires. Rather depth interviews at different times with the same family are needed to study these more subtle effects of rampant inflation. Consequently, we plan to interview in depth some 100 families at several different times over the courses of the research. Approximately 20 of these will be poor families, 20 retired families, 30 blue collar families and 30 white-collar families. Here, each family will be interviewed at least three times at approximately four or five month's intervals. Essentially, the information obtained from these depth interviews will be of great help in designing the questionnaires for the household survey; and these case studies will greatly enrich our analysis of the impact of inflation on families by providing qualitative information and even crude statistical data on the dynamics of familial responses to rampant inflation (recession).

'Again', governmental agencies, particularly the National Bureau of statistics (NBS) have kept a running record of inflation and unemployment over a number of decades. Here, these data exist not only for the economy as a whole but also for most if not all of the states of the country. Thus, we propose to carry out a series of econometric analysis of these official statistics to learn more about the forces making for inflation and unemployment and the forces that may be establishing a positive, rather than the traditionally negative relationship between the two.

In order to perform this macro analysis, it is necessary to write down a general macro model with a parameterization so broad that special parameter values imply models of the Keynesian type of the monetarists type, etc (Leamer, 1986). Thus, the inflation equation is given in its functional form as

$$\Delta P = f(\text{Intercept, lagged inflation, money, unemployment, Deficit/ GNP, foreign price controls}) \quad (4.1)$$

Similarly, the unemployment equation is given in its functional form as

$$U^{-1} = f(\text{Intercept, lagged unemployment, money prices, real government, real autonomous expenditure, Labor force}) \quad (4.2)$$

Mathematically, the inflation equation can be written as

$$\Delta_i p = \beta_0 + \beta_1 L \Delta_i P + \beta_2 \Delta_i m + \beta_3 U^{-1} + \beta_4 D/Y + \beta_5 \Delta_i e + \beta_6 C \quad (4.3)$$

similarly, the unemployment equation is written as

$$U^{-1} = \alpha_0 + \alpha_1 LA_i (U^{-1}) + \alpha_2 \Delta_i m + \alpha_3 L \Delta_i p + \alpha_4 \Delta_i (G/Lp) + \alpha_5 A_i (A/LP) + \alpha_6 F \quad (4.4)$$

where

$$x = \text{Log } X$$

$$L^n x_t = x_{t-n}$$

$$\Delta_n x_t = (x_t - x_{t-n}) / n = \text{average}$$

growth at annual rates of X over the previous n years.

$$A_{nx} = [x_t + x_{t-1} + \dots + x_{t-n+1}] / n \\ = \text{average value of } x \text{ over current and } n-1 \text{ preceding quarters}$$

Here, the inflation equation expresses the rate of inflation in terms of six variables, each with its own distributed lag. The first set of explanatory variables are lagged inflation rates. These variables allow 'momentum' in the inflation process, possibly due to the formation of expectations. Inflation rates up to three earlier years are allowed to affect the current rate. Accordingly, the distributed lag process is characterized in terms of three variables: inflation rates over the past year, the past two years and the past three years. The second set of variables are the growth rates of Money, with timing similar to the lagged inflation rates. The third set of variables are unemployment rate and the Phillips Curve is traditionally expressed in terms of the inverse of the unemployment rate, a form that is adopted for the model estimation. Consequently, the unemployment variables can be multiplied by 25 to make the derivative of the inflation rate with respect to U evaluated at U=5 equal to the coefficient. Essentially, this facilitates the formation of prior information, since the

size of the coefficient on $25U^{-1}$ is the approximate answer to the question. **How much would the infaltion rate increase if the unemployment rate fall from five to four percent?** Again, the fourth variable is the government deficits scaled by GNP. Here, monetarists do not believe the deficit has a direct input on the inflation rate. In other words, if a deficits financed by resorve, the resulting increase in the supply of money reducece the value of money, which is to say inflation of money, inflation results. Assuming the level of money is controlled for, the only route for deficits to affect prices is through their impact on output and the effect will be small. The possibility that deficits generate inflation by first affecting the money supply suggests that we shuold add to our model, an equation describing the determinants of money. It is therefore logically possible to continue to add equation in this way until inflation is traied back to the bigbang. However, the decision to terminate these linkkages with money taken as given reflects the belief that money can be controlled or that the reaction function can be altered. Consequently, money is treated here as if it were exogenms. The next variables are the foreign price level as well as price controls.

To make the two equation systems linear, the unemployment equation expressed in terms of U^{-1} which greatly facilitates policy analysis. This unemployment rate is allowed to depend on past unemployment rates, on the current Labour force, and on distributed lags in money, prices, government, and autonomous expenditures. In writing this equation, we have tried to understand the 1S- LM model which seems to take prices and wages as fixed in the short run. Aggregate demand is then determined by monetary and fiscal policy as well as by the autonomous componenet: investmant plus net exports. If this aggregate demand does not match aggregate supply (measured by the Labour force) then unemployment results. According, the unemployment equation includes current values of money, prices, government expenditure, autonomous expenditure and the Labour force. Also included in the unemployment equation are distributed lags of money and prices.

5.0 ANTICIPATED RESULTS

Indeed, the proposed research promises to make a significant contribution to knowledge that is directly relevant to policy makers essentially, this research program is intended to provide insights into changes in family lifestyles as result of a pervasive and chronic condition of modern society: inflation currently coupled with an even greater economic evil (called recession). Specifically, how Nigerians are adopting and adjusting to these twin disasters and how they are failing to adapt and adjust will be the primary foci of the research. This knowledge therefore should prove of great value to policy makers who must devise programs that will help people cope with these problems. Again, our phased research project may provide some answers to the most perplexing problem confronting today's economists. That is, how it is possible to have both rampant inflation and a recession at the same time. And apart from its value to policymakers, we envision the proposed research as making an important contribution to knowledge by documenting the research findings for professional and public evaluation.

6.0 OUTPUT DISSEMINATION

Essentially, we plan an oral, offline and online dissemination of our research findings. Efforts will be directed towards international conference participation. We shall also apply for off line publications through the various research organization in the African region. The online publications shall be made through **REPEC/ EDIRC** as well as the social science research Network (SSRN). In particular, the Nigerian presidency, National planning commission and National Assembly shall be contacted accordingly.

7.0 BUDGET PRESENTATION

This is a two phase project given the need for a thorough investigative and analytical study. The phase 1 of the project deals with the Moco study while the phase 2 deals with the macro study. Consequently, the budget of this research proposal is presented in two parts.

PHASE 1 (MICRO STUDY)

(1).	Principal Researcher Subsistence and Accomodationsss @ \$ 200 peer day for 80 days	\$1, 600.00
(2).	Assistant Researchers Subsistence and Accomodation For six @ \$100 per day for 80 days	\$4, 800.00
(3).	Data Collection	\$2, 500.00
(4).	Data Analysis (Computer time and software)	\$5,000.00
(5).	Stationary and Material	\$2,050.00
(6).	Secretarial Service	\$2,150,00
(7).	Production Costs	\$1, 550.00
(8).	Communication	\$850.00
(9).	Photocying	\$950.00

TOTAL **\$21,450.00**

Phase 11 (Macro Study)

1.	Principal Researcher Subsistence Accommodation @ #200 per day for 80 days	\$1,600.00
2.	Assistant Researcher Subsistence and Accommodation For four @ #100 per day for 50 days	\$2,000.00
3.	Data Collection	\$1,200.00
4.	Data Analysis (Computer time and Software)	\$5,000.00
5.	Stationary and Material	\$1,550.00
6.	Secretarial Service	\$1,350.00
7.	Production Costs	\$1000.00
8.	Communication	\$570. 00
9.	Photocopying	\$450. 00
10.	Hmorarium	\$5,000 .00
		<u>\$19, 720.00</u>

8.0 PROJECT DURATION

The required study time for the joint phase and phase 11 project is twenty-four months. Here, the first eight months of the proposed study will be spent on a variety of activities. These include analyzing in detail the empirical studies dealing with the effects of the stagflation; devising the research instrument to be used in the household survey and pre- testing the various drafts of the questionnaires (and experience indicates that the instrument for a study of this scope usually goes through five or six drafts), carrying out the first round of interviews with the 100 families selected for the case study (as activity that will contribute to the development of the household survey questionnaires); and Collecting official statistics on inflation, unemployment, and characteristics of the labor force for the economy as a whole and for major cities, data that will be used in the econometric analysis. The last third of the first year will be devoted to the survey data and the official statistics on inflation and unemployment for computer analysis. Thus, by the end of the first year the survey data and the data for the econometric analysis will be on the tapes. During the second year of study therefore, the families in the case study will be re-interviewed (at least two more times) and the various sets of data will be analyzed and research reports written accordingly. Consequently, a tabulated project time

Table is given as follows:

PROJECT LOGISTICAL SET UP	4 MONTHS
SURVEY ADMINISTRATION	6 MONTHS
SURVEY DATA COMPLICATION	4 MONTHS
MODELING ANALYSIS	4 MONTHS
RESEARCH REPORT SUBMISSION	4 MONTHS
REVISED FINAL REPORT SUBMISSION	2 MONTHS

9.0 RESEARCH TEAM (FACILITIES)

Basically, each of the three styles of research represented in this proposal (Household survey, fieldwork or case studies, and the econometric analysis) will be the responsibility of a leading expert in that research tradition. Prof Godwin Chukwudum Nwaobi (the Principal investigator) has had considerable experience conducting large- scale social surveys and has demonstrated his ability to translate large-scale research into significant research papers.

Essentially, he will be in charge of the household survey of 1500 families in six cities to be enumerated. Other members of the research team are graduate economist with level research capacity. However, the proposed research will be carried out at the quantitative Economic Research Bureau (**QUANTER**) ABA. This will be done in collaboration with National Bureau of statistics (**NBS**) **ABUJA**, Nigeria.

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