Informal Sector and Employment Generation in Nigeria: An Error Correction Model

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Abstract
This paper examines the impact of informal sector on employment generation in Nigeria during the period 1970 to 2010 making use of annual time series data. The empirical analysis rests on the augmented Solow growth analytical framework. Our findings show that informal sector activities have significant impact on absorbing the large pool of labour force in Nigeria. The study contends that human capital formation is positively related to unemployment rate which reflects the dearth of government expenditure on education in the country. Therefore, there is an urgent need for the government to re-examine its policies on informal sector.

Key Words: Informal Sector, Employment Generation, Nigeria, Cointegration

1.0 Introduction
World over, the concept of the informal sector has been applied to analyze the employment situation and policy option in most developing countries. A large of the economically active population of these countries finds an income – generating source in economic activities outside the formal or modern sector of the economy. With the restructuring and rationalization of the public sector and the deregulation of the labour market in the private sector, the informal sector phenomena have also assumed significant proportions in many developed countries (ILO, 2003).

Generally speaking, the contributions of the informal sector to the development of the Nigerian economy cannot be over emphasized in terms of employment generation, capital savings and mobilization, efficiency, strong linkages with other sectors, utilization of local technology training ground for entrepreneurs and self-reliance. Since the beginning of 1980s, the economic position of Nigeria has worsened seriously. The per-capita income fall considerably and wage employment has declined (NISER report, 1993). Informal sector constitutes a significant segment of the Nigerian economy. The sector thereby contributes to the Gross Domestic Product (GDP) and employment and contributes significantly to economic development of Nigeria in general (Omisakin, 1999).

Fapohunda (1991) opined that the informal sectors are heterogeneous mix, encompassing a wide variety of economic activities that tend to be ignored in normal economic statistical analysis. These economic activities among others include manufacturing activities, construction trade and commerce and other services such as preparing all types of vehicles, radio and television sets, refrigeration, hair dressing and carpentry. It is assumed that all these activities are often carried out in small unit establishment, owned and operated by one or a few individuals with minimal capital. The evidence seems to indicate that these activities are generally growing fast as they have an increasing capacity to absorb large number of workers who may not be able to secure or hold a wage-earning job in the formal sector.

It is a known fact that Nigeria is endowed with a lot of potential resources that could be harnessed through effective planning to achieve social and economic development. These potential have been expressed in various development plan documents since independence but these proved difficult to achieve.

On social grounds, the entire society is characterized by high rate of indiscipline, ethnic and religious tensions, marginalization of the vast majority, high rate of unemployment, a week production base, a high rate of crime, wide-spread corruption, wastefulness and mismanagement, rural decay and urban dislocation and the likes. Whether in terms of resource mobilization, employment generation or production and distribution of goods and services, the informal sector continue to play a significant role in the economy of developing countries. One significant contribution which the sector also makes to the economic growth and development is in terms of apprenticeship training and entrepreneurship which are developed within it (Omisakin, 1999).

Today, Nigeria is ailing economically not because she is not richly endowed with natural resources, but
presently, there is low industrial capacity utilization and dependence on the imported input for the existing manufacturing industries. The external value of naira suffered a severe decline and the rate of inflation is remarkably high. Therefore, the promotion of small scale industries in the informal sector is expected to produce a process of indigenization of the industrial sector, generate higher employment per unit of investment, make use of local raw materials and lead to the development of local technology and manpower. However, little success has recorded its development in Nigeria. This is due to some perennial problems that have beset the development of the sector over the years and as a result of one-time strategies that were ephemeral. The problems impeding the development of this sector in Nigeria range from financial, managerial, marketing technology, shortage of basic physical infrastructural facilities, raw material and other related problems. In view of these multidimensional problems, the study laid more emphasis on these problems to find out how these factors have interplayed in determining the employment generation of the informal sector in Nigeria (Akerele, 1997).

The growth of the informal sector during the economic reform has led to the renewal of the interest in studies of the informal sector with a view to assessing dynamics of this concept in general. The question of whether the informal sector can absorb the large pool of labour force made redundant or economically insecure in the formal sector and provide basis for renewed growth have now become the central issues to be investigated.

However, despite the increasing interest world over, informal sectors as a tool for actualization of sustainable growth and development among other beneficial effects, there seems to be dearth of research work in Nigeria. This is a research gap this study intends to fill. The present research work is set to provide comprehensive evidence on the significance of informal sector in employment generation drawing evidence from Nigeria. The aim of this study is to examine the level of employment generation in the informal sector. The data utilized consists of annual observations on unemployment, formal sector output, informal sector output, human capital and population of the economy for 31 years (1980-2010).

The remainder of the paper is organized as follows. Following section one is section two which deals with the literature review. In Section three, the methodological framework of the study is pursued while the empirical results are discussed in section four. Section five concludes the paper.

2.0 Review of Related Studies

The informal sector denotes economic activities that obtain outside the formal standard of economic transaction established by the state and formal business practices, although it may not be illegal. The term applies to micro or small business that starts as individual or family self-employment business. It ranges from production and processing as well as cross country trading. Some of these activities involve lack of appropriate business permit tax evasion, non-compliance with labour regulations, governing contracts and work conditions and the non-existence of legal guarantees between suppliers and clients (Bromley 1978).

The term informal sector has been generally criticized because of the confusion and inconsistency encountered in the definition. Peattie (1987) based this on the fact that informal sector is viewed differently by the various interest groups- academic development communities, the business cycle and policy makers. He therefore suggested that it should be discarded.

Bromley (1978) however, agreed that the confusion is a result of lack of theoretical consensus on the meaning of the term “informal economic activity” and lack of reliable conceptual models can be used to ascertain whether they are entrepreneur or distinguish workers.

The notion that labour markets may be dualistic in developing nations date back at least to the work of Lewis (1954) who expresses the view that the rural sector constitute a stock of potential, workers for the urban, formal sectors where jobs pay higher wages. This view is formalized in the model of Harris and Todaro (1970) where urban wages are assumed higher than rural wages. Rural workers who choose to search urban jobs run the risk of becoming unemployed.

In equilibrium, the mass of workers who choose to search is such that expected wages are equated across sectors. Fields (1975) expands on the Harris-Todaro model by assuming that urban workers can choose to become informally employed rather than search for higher paying formal jobs. Ranch (1991) marks the next major break in the modeling of informal economic activities. The model builds on Lucas (1978) span of control model in which agents are endowed with different managerial ability levels. Agents can operate strictly concave technology that transforms labour into the consumption good either in the formal sector or the informal sector. Agents who choose to operate informally can choose to pay workers below the minimum wage but they are constrained to operate below a certain detection threshold. This formalizes the view articulated by Desoto (1989) that producers in developing nations weigh the regulatory cost of operating formally against the benefits, in this case the ability to operate on a more efficient scale. This yield a model that is conceptually consistent with the correlation between the regulation burden and the importance of informal activities and can replicate many salient aspects of the organizations of production in developing nations. For instance, it provides a natural explanation for the fact that firms tend to be either very small or very large in those nations.
Past studies (Fields, 1975; Desoto, 1989; Dessy and Pallage, 2003; Akerele, 1997) have shown that the modern formal sector is unable to cope with the increasing numbers of the poor, unskilled, illiterate and hungry. However, it has been demonstrated that the informal sector is capable of absorbing large proportion of the new entrants into the labour force.

The informal sector thus, constitutes the final destination of an ever increasing number of job seekers. Between 1990 and 1994, Africa’s urban employment was put at ten (10) percent but employment in the sub-Saharan informal sector was 6.7 percent. In 1995, employment in sub-Saharan informal sector was 60 percent of the urban labour force. The informal sectors continuously attract new entrants because in all of its sub-sector, it offers ample scope for the entrepreneurship and build up of technological capacity (Akerele, 1997).

Ranch (1991) emphasizes the fact that like traditional dualistic models, his model predicts those labour markets are segmented along formal/informal lines. Formally employed workers earn more than similar workers who are unable to find formal jobs. But this framework (together with Desoto’s thought-provoking 1989 monograph) also paves the way for a drastic change in the perception of informal activities. In recent papers, the informal sector is most often modeled as the optimal, rational response of economic units (producers) to government-induced distortions rather than disadvantaged end of dualistic labour markets.

Loayza (1996) illustrates this view by describing a model where labour-market segmentation plays no role. Producers can choose to avoid taxation but must then bear an exogenous cost of informality. Similarly Sarte (2000) and Choi and Torn (2005) he described environments where the option to operate informally mitigates the distortions introduced by a rent seeking bureaucracy. In Dessy and Pallage (2003) the productivity differential between the formal and informal sector depends on the amount of taxes levied which makes the emergence of economies with high tax rates and large informal sectors endogenous.

Quintin (2000) and Antunes and Cavalcanti (2005) explicitly model the cost of informality as the lack of access to contract, enforcement and quantity the effects of the tax burden and limited enforcement on the size of the informal sector via calibrated numerical stimulations. Straub (2005) studies the impact of limited enforcement on informal activities in a model that explicitly considers the role and quality of informal credit mechanisms. Ihrig and Moe (2004) quantify the importance of various aspects of tax policy on the size of the informal sector.

The theoretical debate over whether a satisfactory model of informal activities should assume or imply some wage segmentation has important implications for policy. One natural policy response to wage segmentation is to introduce a formal sector wage subsidy (Ray 1998). If labour markets are approximately integrated however, such a subsidy could have adverse effects on welfare and net tax revenues. If wage differentials across sectors reflect primarily productivity differentials, policy that aim solely at reducing the size of the informal sector are likely to be a poor substitute (at best) for direct investment in education or investments in the quality of formal institution. Regardless of the outcome of the debate over segmentation, modern theories of informal economic activities provide natural explanations many salient features of the organization of production in developing countries.

Ogunbona and Siyanbola (2004) associated constraints that participate failure of small business, especially those managed by women with inheritance laws (which state the supremacy of the male over the female on the sharing of the property resources of dead relatives) domestic violence, street trading, household or domestic financial burdens. Others are in appropriate technology, the low scale and scope of women productive capacity and resource-based low level of self-help initiatives. They also observed the negative effect of infrastructure inadequacies, energy and water shortages, regional differences in educational opportunity, energy and water shortages, regional differences in educational opportunity, legal and administrative barriers to development, finance, sub-standard materials and child-health services, inadequate facilities for vocation training and capacity building. They opined that the removal of these constraints is possible through programs that meet the strategic needs of the operators of informal sector especially women. And thereby gender equity in general core sectors, some of which are adult literacy programs through vocational training, market infrastructure development, business loans for small scale traders, export loan for women in across border trade and in plantation in agriculture.

Ibitoye (2000) identified lack of honesty as one of the major causes of small business failure in informal sector. Most of the informal economic operators do not keep their money in the conventional bank but use an informal system referred to as “Esusu”. This is a system of daily contribution of an agreed amount of money, which the depositors would collect at the end of the month or at the stated period without interest. Some informal sector operators have lost all deposits as a result of dishonest “Esusu” operators. This would invariably lead to the end of the depositors business. Ibitoye therefore suggested that the formal banking sector should adapt this system, for the benefit of the informal sector operators especially in the rural areas.

Soneye (2000) in his studies opined that three major factors contribute to business failure among the informal sector operators. These are lack of inappropriate technical know-how, poor financial management and
indiscipline. He therefore suggested that prospective informal sector operators should be trained before
embarking on any project, the training should include technological acquisition, cash and business management.

Ogunbona and Siyanbola (2004) defined corruption as one of the activities of the informal sector. They
viewed corruption as a negative macro factor in the economy. They used the input-output model of the Nigerian
economy to analyze the effect of corruption on the economic performance. Corruption was taken to be one of the
sectors of the economy which initially does not contribute any resource to other sectors. The empirical analysis
showed that corruption resulted in the reduction in output, Gross Domestic Product, employment generation,
input required and output per sector. It also increased the leakage within the sector since was assumed that
corruption invested all its resources outside the economy or country. When corruption as a sector was assumed to
contribute some of its resources to other sectors as input for production, labour and output requirement per sector
increased which is tantamount to improved national prosperity.

3.0 Theoretical Foundation and Methodology
Undoubtedly, there are extensive research work on the significance of informal sector in the actualization of
sustainable economic growth and development. However, there seems to be no consensus in these studies on the
empirical form of the specification of a model qualifying the impact of informal sector can take or follow.
Conventionally, empirical specification of growth/development oriented model often follows the Solow growth
model, although subsequently modified by Mankiw et. al (1992) (which is termed “augmented Solow growth
model). Solow (1956) postulated that economic growth is as a result of the accumulation of physical capital and
an expansion of the labour force in conjunction with an “exogenous” factor, technological progress, that makes
physical capital and labour more productive (see Odusola, 1998). However, Mankiw et al (1992) extend the
Solow aggregate production function to include educational capital.

\[
Y_t = A(t)K_t^{\alpha_k}H_t^{\alpha_h}L_t^{\alpha_l} \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots 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applies the error correction model (ECM) framework (with particular attention given to causality) through Granger’s representation theorem (Engle and Granger 1987). The equation is then estimated with an error correction term, which represents the speed of adjustment to out of equilibrium movements in the stated model1.

\[
\Delta \log(UMP)_t = \alpha_0 + \sum_{i=1}^{j} \alpha_1 \Delta UMP_{t-i} + \sum_{i=1}^{j} \alpha_2 \Delta \left[ \frac{FSO}{POP} \right]_{t-i} + \sum_{i=1}^{j} \alpha_3 \Delta \left[ \frac{INFSO}{POP} \right]_{t-i} + \sum_{i=1}^{j} \alpha_4 \Delta \left[ \frac{HC}{POP} \right]_{t-i} + \alpha_5 \Delta ECM_{t-1} + v_t \tag{4}
\]

Among these criteria, the AIC and SIC is often preferred as it gives the heaviest penalties for loss of degrees of freedom. Thus, the model with the least value of AIC and SIC is assumed to give the best fit for equation (4).

The study is based on the use of time series data. The data utilized consists of annual observations on unemployment, formal sector output, informal sector output, human capital and population of the economy for 31 years (1980-2010). The data obtained were from various issues of Federal Bureau of Statistics (FBS), CBN statement of account and annual report and Penn World Data.

4.0 Estimation and Interpretation of Results
For this paper, we have applied unit root test to check the stationarity of the variables under study. Specifically, the Augmented Dickey-Fuller (ADF) is used; the ADF is used to avoid spurious regression thereby subjecting each of the variables used to unit root test so as to determine their orders of integration since unit root problem is a common feature of most time series data. The ADF employs the following equation:

\[
\Delta y_t = c_1 + c_2 t + \omega y_{t-1} + \sum_{i=1}^{r} d_i \Delta y_{t-i} + v_t \tag{5}
\]

The null hypothesis is that there exists a unit root in the time series (non-stationary time series), which is Ho: \( \omega = 0 \) against the alternative hypothesis that the time series is stationary (no unit root) or 1(0) which is \( H_1: \omega < 0 \). In both tests, if the calculated statistic is less (in absolute terms) than the MacKinnon (1991, 1996) critical values, the null hypothesis is accepted and will therefore mean that there is a unit root in the series. In other words, it means the time series is not stationary. The opposite is true when the calculated statistic is greater than the MacKinnon critical value.

Following the unit root test, bivariate cointegration is investigated in the present paper using the Engle-Granger (1987) procedure which is residual based. The test procedure involves testing whether the linear combinations of the variables (integrated of the same order) being considered are themselves stationary, in which case the variables are said to be cointegrated. Formally, the procedure is as follows. Assuming \( x_t \ and y_t \ be \ two \ I(1) \ series \).

\[
v_t = y_t - c_0 - c_1 x_t \tag{6}
\]

Table 1: Unit root test (ADF)

<table>
<thead>
<tr>
<th>Variables</th>
<th>ADF Values</th>
<th>Critical Values</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>UMP</td>
<td>-5.3153*</td>
<td>-3.6793</td>
<td>I(1)</td>
</tr>
<tr>
<td>FSO</td>
<td>-4.5688*</td>
<td>-3.7378</td>
<td>I(0)</td>
</tr>
<tr>
<td>INFSO</td>
<td>-4.1827*</td>
<td>-3.7378</td>
<td>I(0)</td>
</tr>
<tr>
<td>HC</td>
<td>-6.9652*</td>
<td>-3.6793</td>
<td>I(1)</td>
</tr>
<tr>
<td>ECM(-1)</td>
<td>-7.2852*</td>
<td>-3.6267</td>
<td>I(0)</td>
</tr>
</tbody>
</table>

Source: Computed by the Researcher, 2012

Note: One, two and three asterisk denotes rejection of the null hypothesis at 1%, 5% and 10% respectively based on critical values

The above results i.e. ADF test in Table 1 shows that all the variables are stationary at levels with the exception of unemployment rate and human capital. All the variables are found to be stationary at 99 percent significance level in their levels and first difference from with the assumption of constant.

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1 The larger the coefficient, the greater the adjustment of the dependent variable to the deviation from long run equilibrium in the previous period (Dolado, et. al 2001).
The error correction term (ECM) unit root result summarizes the presence of cointegration analysis among the variables under study. In addition, existence of long run relationship among the variables was also examined by applying the framework Engle-Granger (1987). The result of the test on the structural models reveals the existence of cointegrating relationship for unemployment, formal sector output, informal sector output, and human capital. The existence of the cointegrating equations in this respect indicates the need to set up a dynamic error correction model to capture relationship among variables involved.

Table 2: Parsimonious Error Correction Estimates

<table>
<thead>
<tr>
<th>Dependent Variable: D(UMP)</th>
<th>Method: Least Squares</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>Coefficient</td>
</tr>
<tr>
<td>D(UMP(-1))</td>
<td>25.0047</td>
</tr>
<tr>
<td>D(FSO/POP(-2))</td>
<td>-7.5253</td>
</tr>
<tr>
<td>D(INFSO/POP(-2))</td>
<td>-56.9231</td>
</tr>
<tr>
<td>D(INFSO/POP(-3))</td>
<td>-24.86599</td>
</tr>
<tr>
<td>D(HC/POP(-2))</td>
<td>0.9213</td>
</tr>
<tr>
<td>ECM(-1)</td>
<td>-0.0493</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.6347</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.5786</td>
</tr>
<tr>
<td>F-statistic</td>
<td>21.84775</td>
</tr>
<tr>
<td>Prob(F-statistic)</td>
<td>0.009533</td>
</tr>
<tr>
<td>Durbin-Watson stat</td>
<td>1.219831</td>
</tr>
</tbody>
</table>

Source: Computed by the Researcher, 2012

Note: One, two and three asterisk denotes rejection of the null hypothesis at 1%, 5% and 10% respectively.

Table 2 explains the impact of informal sector on employment generation which is presented in the table below. The regression co-efficient of (-7.525) means that, a unit increase in formal sector output brings about 75 percent decrease in unemployment rate. The co-efficient of (-56.923) means that, a unit increase in informal sector output brings about 569 percent decrease in unemployment rate. The co-efficient of 0.921 means that holding all other variables constant, a unit increase in the human capital brings about 92 percent increase in the unemployment rate. The overall co-efficient of determination (R²) shows that the equation has good fit with 63 percent of unemployment rate explained by the variables in the equation. The reason for being a good fit is that it is significantly above the bench mark of 50 percent. As the adjusted variables R² tends to be affected by the number of included explanatory variables, the adjusted (R²) was made to purge the influence of the number of included explanatory variables, the model is still of good fit, and the dependent variable explained by the equation by 57.8 percent, hence in terms of goodness of fit we can say that the test is conclusive. The Durbin Watson (D.W) statistics of 1.219 as it is significantly below the bench mark of two, we can conclude that there is no autocorrelation or serial correlation in the model specification hence, the linear assumption is not violated.

The estimated coefficient for the error correction term reveals which of the variables adjust to correct imbalance in the unemployment situation whilst the variable coefficients show the short-run effects of the changes in the explanatory variables on the dependent variable. The results confirm that unemployment in Nigeria has an automatic mechanism and that employment generation in Nigeria responds to deviations from equilibrium in a balancing manner. A value of (-0.049) for the ECM coefficients suggests that a fast speed of adjustment strategy of roughly 5%.

In terms of the signs and magnitude of the coefficients which signify the impact of informal sector on employment growth, it can be seen that all the variables except human capital concur with a’priori theoretical expectation. The reasons for this could be associated to the fact that growth in knowledge is not complemented or used up by the teeming population; hence, it yields little or nothing to reducing unemployment situation in the country. The significant coefficients of all exogenous variables clearly state that Nigeria’s employment growth depends on formal sector output and informal sector output in the short run. Above all, informal sector activities in the Nigerian economy have positive impact on employment generation. The results of this paper authenticate the
findings of Akerele (1997) and Dessy and Pallage, (2003) that informal sector activities have substantially absorb the large pool of labour force than the formal sector, hence, reduces the rate of unemployment.

5.0 Concluding Remarks

The informal sector a varied and heterogeneous sector operating in a number of fields providing services at low cost and within the reach of the consumers. Many of the persons working in that sector have low level of education and have learnt some elementary skills on the job. They are not attracted to the training centers to go for the improvement of their knowledge or skills. However, these small enterprises are providing more than 50% of the employment in the non-agricultural sector and thus contributing in minimizing unemployment problem. However, the conclusion, which results from this research work seems to concur with observations and recommendations made by many economists. Nigerian government must stop marginalizing the informal sector; on the contrary they should encourage its development by making it official. In this case, access to the credit market will be easier and grants will then be possible. The resulting economic dynamic will then perhaps enable the Nigerian government to reduce the unemployment and misery of both rural and urban areas. Despite this increase in unemployment rates, the rise of employment in the informal sector is observed everywhere and has been particularly rapid in the Nigerian economy.

References


