Cost of Governance and the Empirics of the Nigerian Welfare Question: An ARDL Option

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Abstract

Nigeria has had a chequered political history since independence. The country's economic crisis apparently bears some relation with the political circumstance, which includes the rising cost of governance. To this end, the paper using an autoregressive distributed lag (ARDL) approach, examines the welfare implications of this rising cost of governance in Nigeria between 1990 and 2009 using quarterly data based on econometric tools.   Indeed, the near subservient of Nigeria populace is a serious cause for concern especially when   one considers the fact that it is a far cry   from   the millennium development target growth of 7 percent that is   required to halve poverty by the year 2015. The results from the analysis show that most of the cost indicators were negative contrary to theoretical expectations. This was not unexpected as most costs of governance in Nigeria do not translate to good governance through the provision of infrastructure that impact directly on the wellbeing of the people.

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Also, the results further demonstrate that in spite of the political transition since 1999, the general welfare of the people remained a big question. The study notes that the recent call to review downward the welfare packages of public officers that constitute more than 30 percent of the national budget is a right step to channel these funds to productive use and infrastructural development. Only government with *minimum administrative cost* made up of credible people with dynamic people oriented programmes would there be any hope to alleviate poverty, improve human health, productivity, income and ultimately the standard of living of the people in general.

1. INTRODUCTION

Governance has been described as the exercise of political power in the management of human affairs, particularly at the national level. It is also widely acknowledged that the economic foundation of any country largely determines its political structure; In other words, the economy is the substructure on which the social system of a state is built. (Ignatius, 1994) Ikpeze in 1994, remarks that "Governance", has no generally accepted definition. However, the essential stuff of governance is "the exercise of power and authority in both the economic and political spheres" (Brautigam, 1991)

For any society to prosper, it needs to have a government to run its affairs. The government helps to sustain the social contract that binds every member of the state. Thus, the price that is paid for a state to be prosperous is for it to have an established government that enforces the social contract. Members of an ordered society, called a state, must pay taxes sufficient to carry out the functions assigned to the state. The funds needed to put in place and maintain the various organs of government is the cost of governance (Adeolu, 2007).

In Nigeria, the costs required to put and run the various organs of government have increased dramatically over the years, such that, it has increasingly reduced proportion of public revenue available to support and implement the primary functions of government (CBN, 2005). Consequently, the discharge of beneficial government functions has been hampered.

Economic welfare has been variously defined. Edu, (2005) summed all these definitions up by describing it as "having command over basic consumption needs". Furthermore, economic welfare which is the hubbub of economic development has multiple dimensions, the complexity of which is masked often by the definition, (Okeke, 2011).

Observers of economic matters in Nigeria have however maintained that behind the glamour and expectation which attend all elections and the swearing ceremonies of public officers nationwide lurks the reality that more Nigerians high and low are increasingly more disturbed at the pattern of cost of governance. And at what they regarded as "unimaginativeness and stereotype" nature of the expenditure that must follow one particular pattern no matter how anachronistic and unrelated to the welfare of the people.

Viewing the developmental roles of the various organs of the government as enunciated in the 1999 Nigeria Constitution, vis-à-vis the standard of living of the people, presents the study as "Food thought for many versed economists and politicians who are worried about the budgetary allocation of the Nigerian Federal Government year in and year out to elect and maintain public officers.

Given the dynamic nature of the cost of governance in Nigeria over the years, what is the implication of this trend on the provision of basic necessities of life such as food, shelter, health and public services for the people? This is the main focus of the paper. To this end, the paper is structured into five sections. Section II x–rayed the existing state of the Nigeria political structure and cost. Section III focused on the welfare question. The methodological framework and sources of data formed chapter IV. While empirical results were presented in Section V. The paper is however concluded in section VI.

2. THE EXISTING STATE OF NIGERIA POLITICAL STRUCTURE AND ADMINISTRATIVE COST

To fully appreciate the cost of governance in Nigeria, the existing state of Nigeria political structure is examined thus,

2.1 The Existing State of Nigeria Political Structure: Theoretically, Nigeria operates a federal system of government with federal government at the centre (Abuja). 36 state governments and 774 local governments, including six area councils located at the federal capital territory, Abuja. Each of these levels of government has its sphere of influence and functional competence. The constitution of the Federal Republic of Nigeria has also assigned responsibilities to three levels of government. These responsibilities constitute the cost of governance at various levels. For instance, the federal government has exclusive responsibility for some functional subjects under the 'exclusive legislative list' while the state government have control over the 'concurrent legislative list' of functional subjects.

Repeatedly, the forth schedules of the 1979, 1989 and 1995 (draft) constitutions outlined the function that should be performed by the local governments. Some of the listed functions are exclusive to the local government, while others are concurrent i.e., they could be executed in conjunction with state governments or state/private agencies.

The cost of governance, which has to do with political expenditure over the years in Nigeria changes with the constant dynamics of the political structure.

Currently, with the democratic structure at the centre (federal), we have;

(a) Presidency
(b) Presiding National House of Assembly
(c) The House of Representative
(d) The Ministers
(e) Political party leaders and electoral commissioners
(f) Federal Commissioners, (NAFDAC, INEC, ICPC, EFCC, etc.)
(g) Others

At the State Level

(a) Governors and Deputies
(b) State House of Assembly
(c) Commissioners
(d) Political Party leaders and traditional councils
(e) Others

At the Local Level

(a) The Chairman and Vice
(b) Councilors
(c) Supervisory Councilors
(d) Political ward leaders
(e) Others

Furthermore, each of these arms of politicians is adorned with.

(a) Senior Special Assistants (SSA).
(b) Special Assistants (SA).
(c) Personal Assistants (PA).
(d) Special Advisers (SA).
(e) Special, Special Advisers (SSA).
(f) Political god fathers and Consultants.

Akpan, (2005) aptly stated that the political structure of Nigeria remained amorphous since independence with the continuous creation of states and local councils and incursions of military into the political terrain.

Table 1

The Changing Political Structure of Nigeria

Level of Govt.	1960	1967	1976	1979	1987	1991	1996	2000	2005	2008	2011
Central (Federal)	1	1	1	1	1	1	1	1	1	1	1
Region/ State	3	12	19	19	21	30	36	36	36	36	36
Local Govt.	NA	29	29	30	44	58	77	774	77	77	774

Source: Adapted from F.O.N Roberts, 1997 and modified by authors
         NA = Not Applicable.

Highlights of Table 2:

1. Regime type:

(a) Military, Authoritarian; 347 months or 29 years.
(b) Civilian, democratic; 156 months or 13years.
(c) Quasi – civilian interim; 2½ months

2. Geopolitical Distribution of Federal Headship:

(a)   North: 448 months 37½ years – North–West 170 months; North–East 63½, North Central 214½ months

(b) South: 170 month or 14½ years – South-West 141, South–East; 6½ months; South–South 23½ months.

3. Percentage Geo-political Distributions:

(a) North: 72.4% – North–West; 27.5%, North–East; 10.3%, North Central: 34.7%

(b) South: 27.5% – South–West; 22.8%, South–East: 1.1% South–South; 3.8%

Source: complied by the authors from historical records.

Table 2
Modes of Governance and Geo-Political Distribution of
Federal headship/leadership in Nigeria: 1st October, 1960-July, 2011.

Period	Regime Type	Duration	Federal leader/ Zone
Oct.1, 1966 - Jan. 14, 1966	Civilian Parliamentary Democracy	63½ Months	Tafawa Balewa North-East
Jan.15, 1966 - Jul 28, 1966	Military, Authoritarian	6½ Months	Aguiyi Ironsi, South-East
Jul. 29, 1966 - Jul. 28, 1975	Military, Authoritarian	108 Months	Yakubu Gowon North-Central
Jul. 29, 1975 - Feb. 13, 1976	Military, Authoritarian	6½ Months	Murtala Mohammed, North-West
Feb. 14, 1976 - Oct. 1, 1979	Military, Authoritarian	42½ Months	Olusegun Obasanjo, South-West
Oct. 1, 1979 - Dec. 31, 1983	Civilian Parliamentary Democracy	52 Months	Shehu Shagari, North-West
Dec. 31, 1983 - Aug. 27, 1985	Military, Authoritarian	20 Months	Muhammadu Buhari, North-West

(*contd.*)

Period	Regime Type	Duration	Federal leader/ Zone
Aug. 27, 1985 - Aug. 25, 1993	Military, Authoritarian	96 Months	Ibrahim Babangida, North-Central
Aug. 25, 1993 - Nov. 13, 1993	Interim National Government	2½ Months	Ernest Shonekan, South-West
Nov. 14, 1993 – Jul. 7, 1998	Military, Authoritarian	56 Months	Sani Abacha, North-West
Jul. 8, 1998 - May 28, 1999	Military, Authoritarian	10½ Months	Abdulsami Abubakar, North-Central
May 29, 1999 - May 28, 2007	Civilian Presidential Democracy	96 Months	Olusegun Obasanjo South-West
May 29, 2007 - May 5, 2010	Civilian Presidency Democracy	35½ Months	Musa Yaradua North-West.
May 6, 2010 - July 30, 2011	Civilian Presidential Democracy	24½ Months	Ebere Goodluck Jonathan South-South

2.2 The Structure and pattern of cost of Governance in Nigeria:
Cost of governance has been variously defined. In a nutshell, it is an amount of expenditure (actual or notional) incurred, attributable or used for the service and maintenance of those in authority, that set rules to govern behaviour, decide when rules have been violated and punish offenders (Okoye, 2005). Others argued that this cost should include the expenditure incurred during elections to put these personnel in positions.

Lagos chambers of commerce and industry (2002) stressed that federal cost of governance is the amount that include the remuneration, salaries, and allowances payable to the holders and workers in the legislative, executive and judiciary as well as other maintainers of law and order (Court and Police) and the defenders of internal and external (military). Cost of governance is often regarded as general administrative cost.

Among the political systems of government practice in modern civil societies, the parliamentary and presidential systems are the most common. To distinguish, the former as practice in Britain and practiced in Nigeria between 1960 and 1966 with prime minister as the head of government at the centre supported by regional heads. There is fusion of powers between the legislatures and executive. Only the judiciary is separate.

In the presidential system, currently practice in Nigeria, United States of America (USA), the president elects by the electorates is the chief executive. There is vice president, appointed ministers assistant ministers (ministers of States), special assistance, directors in ministries and permanent secretaries at the centre. The constitution allows the existence of states and local government levels. These levels also maintain a large number of political and administrative personnel.

From this comparison, and other studies, it can be inferred that there are more personnel and offices in presidential than parliamentary system. Thus, more resources are required to nurture and sustain presidential system than parliamentary system of government.

Structurally, Cost of governance popularly referred to as general administrative expenditure is divided strictly between recurrent and capital expenditure. Succinctly, cost of governance could be discussed under the following;

(a) *Recurrent   Administrative   Expenditure:*   Recurrent administrative expenditure is made up of all "Consumption" items such as goods and services, personal cost, overhead cost etc. the salaries and the

allowances paid to the various political office holders constitutes a greater proportion of this cost in Nigeria.

Recurrent expenditure on administration averages N2312.3 million between 1977 and 1987. It fluctuated between N50404.5 million and N970.48.0 million in 2000. In 2005, it has risen astronomically to N434671.8 million. With the creation of more states, local councils and political portfolios, recurrent expenditure on administration took about 25% of the federal government budget.

(b)   *Capital Administrative Expenditure*: This is the cost of bringing into existence new institutions, services and projects. This includes all expenses which contribute to long term administrative development. Such expenditure is constitutional reforms, man power development, establishment of barracks, legislative quarters etc (Kwon, 2003).

Capital expenditure on administrative facilities and human resources averaged N1109.1 between 1977 and 1987. However, this figure reduced to average value of N502 million between 1987 and 1990 due to the relative political stability under the military regime. The fluctuation continues until 1999 when the fourth republic was introduced, rising to about N422730m in 2000.

Since 1999, a lot of democratic structures and reforms have been on going, hence capital expenditure has continued to maintain upward trend. It runs neck-to-neck with the recurrent administrative expenditure.

Summarily, both recurrent and capital expenditure on administration have been on the increase. However, where a rising proportion of government budget at whatever level, is used to support the administrative structure of government, poverty is bound to be pervasive as economic growth slows or even stagnates.

In 1977, total administrative expenditure as a percentage of total government expenditure was as high as 34.04 percent, rising further to 39.81 percent in 2002. This implies that maintaining government administrative structures constitutes a great cost to the economy, as available funds are barely sufficient to finance projects in vital sectors of the economy.

Enormous administrative expenditure is not only used to finance an usually large, inefficient and corrupt civil service personnel, but also a larger than optimal executive cabinet, and an ineffective legislature.

Table 3

Analysis of Federal Government Administrative Expenditure, (1977-2009)

Year	(A) Rec. Adm. Exp	(B) Cap. Adm. Exp.	(A+B)Tot. Adm. Exp.	Tot. Gov. Exp.	Tot. Adm. % Tot. Gov. Exp.
1977	1331.2	1524.5	2855.7	8823.8	32.36
1978	1081.3	1112.5	2193.8	8000.0	27.42
1979	1165.8	1109.1	2274.9	7406.7	30.71
1980	1709.0	1501.1	3210.1	1468.5	21.45
1981	2174.5	682.3	2856.8	11413.7	25.03
1982	2174.1	930.6	3104.7	11923.2	26.04
1983	2567.9	1098.0	3665.9	9636.5	38.04
1984	1659.9	573.4	2233.3	9927.6	22. 50
1985	1927.0	502.0	2429.0	13041.1	18.63
1986	2008.4	574.1	2582.5	16223.0	15.92
1987	2214.3	274.5	2488.8	22021.4	11.30
1988	3865.0	1306.5	5162.5	27749.5	18.60
1989	3592.0	993.9	4585.9	41028.3	11.18
1990	5404.5	1969.7	7374.2	60268.2	12.24
1991	7413.7	2942.5	10356.6	66584.4	15.55
1992	8842.6	3404.6	12247.2	92797.4	13.20
1993	18769.1	6788.0	25557.1	191228.9	13.36
1994	20851.7	10832.7	31684.4	160893.2	19.69
1995	32824.5	1685.5	34510.0	248768.1	13.87
1996	49128.0	13328.4	62456.4	336629.6	18.55
1997	45905.1	31462.8	77367.9	428215.2	18.07
1998	51942.0	49808.7	101750.7	487113.4	20.89
1999	97048.0	42730.0	139778.0	947690.0	14.75
2000	110287.9	46026.1	156314.0	701059.4	22.30

(contd.)

Year	(A) Rec. Adm. Exp	(B) Cap. Adm. Exp.	(A+B)Tot. Adm. Exp.	Tot. Gov. Exp.	Tot. Adm. % Tot. Gov. Exp.
2001	180810.0	4925490.0	5106300.0	1018025.6	50.59
2002	331736.0	73577.4	405313.4	1018155.8	39.81
2003	307848.5	87958.9	395807.4	1225965.9	32.29
2004	306842.8	137775.8	444618.6	1384001.2	32.13
2005	434671.8	171614.1	606285.9	1743240.0	34.78
2006	431493.1	172141.8	603634.9	1913292.0	31.55
2007	984394.9	201321.6	685716.5	2043291.0	33.60
2008	503921.7	291331.5	795253.2	2544818.0	31.24
2009	595641.9	3021191.4	897761.3	3052388.4	29.41

Source: Same as Table 1.
Notes:

Rec. Adm. Exp – Administrative expenses (Recurrent)
Cap – Capital Expenditure
Cap. % Tot – Capital Expenditure as percentage of total expenditure
Cap. Adm. Exp. – Administrative Expenses (Capital)
Tot. Adm. Exp. – Total Administrative Expenses
Tot Gov. Exp. – Total Government Expenditure
Tot. Adm. % Tot. – Govt. Exp. Administrative Expenditure as
                    percentage of Total Government Expenditure

3. THE WELFARE QUESTION

Welfare is an assessment of the wealth and prosperity at which people live. The people's welfare usually takes into account only material items such as income or ownership of consumer goods (Encarta, 2002). Most often, the people welfare akins to the standard of living which is used to identify people's means to satisfy their basic needs. It means the ability of the people to have access to those things that make life comfortable, like shelters, food and general infrastructure that make life meaningful and tends to increase life expectancy (Robinson and Torviuk, 2008).

There are many ways in which the welfare or standards of living are assessed and compared. Average national income is one way of assessing living standards and is conventionally arrived at by dividing Gross Domestic Product (GDP) by the population to obtain per capita income (PCI). If the population is growing at a lower rate than GDP, living standards are deemed

to be rising. If the population is growing at a higher rate than GDP, living standards are said be falling.

Smith (1776) implicitly accepted the growth of the "wealth" of a society, that is, the growth of the gross national product, as a welfare criterion. He stressed that economic growth resulted in the increase of social welfare because growth increased employment and the goods available for consumption to the community. To Smith, economic growth meant bringing W Closer to W* (W = existing, W* the Desired Economic Configuration).

The growth criterion implies acceptance of the "status quo" of income distribution as "ethical or just". A major problem of this criterion as a measure of welfare is that growth may lead to a reduction in social welfare depending on who avails mostly from it (koutsoyiannis, 1977). Also, this growth criterion does not take into account the cost of living in a country.

Due to some of the observed lapses of the growth criterion, the Purchasing Power Parity (PPP) criterion seem to be preferred, which take into account how many goods and services can be bought by per capita income in local currency (Encarta, 2002)

Another measure of welfare is the Human Development Index (HDI), first published by the United Nations Development Programme in 1990. HDI take GDP per head plus adult literacy and life expectancy into account. Thus, reflecting to a limited extent the quality of life.

The HDI is an improvement on the traditional Per Capita Income indicator. The basis of the HDI is that human development goes beyond the improvement in income to the wider terrain of the choices open to an individual. The HDI (UNDP, 1990) contains three indicators: life expectancy, educational attainment–repressing knowledge, and real GDP (in Purchasing Power Parity Dollars)–Representing a decent standard of living. The HDI reflects the extent to which a people have been empowered to attain the basic indicators.

The three basic HDI indicators are reduced to a common standard on a scale between 0 and 1. The HDI emphasizes the four essential components of human development, productivity, equity, sustainability and empowerment. The HDI is unique in that it brings out vividly the inadequacies in the development process. (Uzor, 2011)

It should be noted explicitly that the positive relationship between high capita income and an improvement in people's welfare may not always hold. It is possible for the HDI to be high whilst there is a low per capita

income, while the opposite is also true. The ideal thing is for a high per capita income to be reflected in relatively higher level of human development. This is the essence of governance.

The main purpose of governance is to formulate economic policies, protect the territorial integrity within and without and provision of security. All aimed at achieving maximum social benefits. In a developing country like Nigeria, public administrative costs have an active role to play in reducing regional disparities, developing social overheads, creation of Infrastructure of economic growth in the form of transport and communication facilities, education and training, growth of capital goods industries, basic and key industries, research and development and so on. Administrative expenditure has a great role to play in formulating policies aimed at stimulating savings and capital accumulation which are necessary conditions for increase in productivity that forms the basis of standard of living. (Okeke, 2011)

The puzzle is, to what extent has this institution dynamics of the Nigerian administrative expenses succeeded in providing free affordable, and qualitative education, health, water, social security schemes like old-age pensions, unemployment relief, sick allowance, articles of common consumption like food and most importantly, admissible real per capita income. The answer to this question forms the main fulcrum of this paper using the Human Development Index (HDI) and real Per Capita Income (PCI) where necessary.

4. METHODOLOGICAL FRAMEWORK AND SOURCES OF DATA

4.1 Data Sources: This study relies on historical quantitative data, which are available in secondary form. The study employs quarterly time series data spanning between 1990 and 2009. The variables used, which include human development index, total federal government revenue, recurrent administrative expenditure, capital administrative expenditure, real per capita income, total federal government expenditure on education and a dummy for regime type, were obtained from the International Financial Statistics (IFS), the publication of International Monetary Fund (IMF), and was supplemented with the CBN Statistical Bulletin.

4.2 Model Specification: Of the various measures of welfare, the Human Development Index (HDI) stands out as the best as emphasized by UNDP, 2007. This is due to the fact that the index focuses on human development. It is "People-centered", as the primary objective of development are people.

The HDI is a measure of achievement that incorporates income and non-income factors. Three factors: longevity, knowledge and income. Generally therefore, UNDP's human development HD is

$$HD = \delta(e_o, lit, y) \qquad (1)$$

where

e_o = life expectancy at birth.

lit = literacy rate.

y = Per Capita income.

These three indicators - life expectancy (X_1), literacy (X_2), and the logarithm of real GDP per capita (X_3) are specified at the national level as components of the index. By taking across a range of countries, the maximum and minimum value for each indicator is established. A deprivation index for the ith indicator and the jth country is then defined as

$$Iij = \left[\frac{\max Xij - Xij}{\max Xij - MinXij} \right] \qquad (2)$$

where

$$0 < I$$

The UNDP (1990) defined the deprivation index for country j as a simple average of the indices for the country;

$$Ij = \left(\frac{1}{3}\right) \sum_{i=1}^{3} Iij \qquad (3)$$

Then, the human development index is given as

$$HDI = I - Ij \qquad (4)$$

From the literature, there are various factors that cause variations in the components of human development as shown in equation one (1). To this extent, the welfare of the people as proxy by HDI is determined by institutional and non institutional factors alike. From the literature, the following factors have been identified and properly measured in this study. These include, total federal government revenue (TR_t), recurrent administrative expenditure (RAE_t), Capital Administrative Expenditure (CAE_t), Real Per Capita Income (RPE_t), total federal education expenditure (TEE_t) and a regime type, represented by a dummy (Dum). The functional form of the model is specified thus;

$$HDIt = F (TR_t, RAE_t, CAE_{tt}, RPCi_t, TEE_t, Dum) \qquad (5)$$

$$HDI_t = \lambda_0 + \lambda_1 TR_t + \lambda_2 RAE_t + \lambda_3 CAE_t + \lambda_4 RPCi_t + \lambda_5 TEE_t + \lambda_6 Dum + E. \qquad (6)$$

$$\lambda_1, \cdots \lambda_s > 0, \ \lambda_6 \gtrless 0$$

Since the data are time series; we explore their long run properties. The stationarity of the series is tested using the Augmented Dickey-Fuller (ADF) test statistics to investigate the presence of unit root under alternative hypothesis that the series is stationary around a fixed term trend. ADF tests are performed using the ordinary least squares technique to estimate the following equation.

$$\Delta x_t = \sigma_0 + \sigma_1 \Delta Y_{t-1} + \sigma_{2t} + \sum Q \Delta X_{t-1} + E_t \qquad (7)$$

Where t is a time trend; the null hypothesis of non-stationarity is rejected if σ_t is less than zero and statistically significant.

However, the basic model can be reformulated with the error correction representation as

$$\Delta y_t = \sigma_0 + \sigma_1 \Delta Y_{t-1} + \sigma_2 \Delta X_{t-1} - X^{Zt-1} + E_t \qquad (8)$$

Where Z is the residual term from the static regression of y_t on X_t. The Optimal lag length is determined using the Akaike Information Criterion (AIC)

4.3 Econometric Framework: There are several methods available for conducting the co-integration test. The most widely used methods include the residual-based test of Engle Granger (1987), and the maximum likelihood based test of Johansen (1991) and Johansen–Juselius (1990). The Engle–Granger co-integration test consists of a two step procedures. In the first step, the residual error is tested for stationarity. Variables A and B might individually be non stationary, but it if the estimate of their residual error is stationary, a long run relationship and the regression is not spurious Engle and Granger (1987) have shown that any co-integrated series has error corrected representation. Therefore, if the residual error of the estimation in the first step is stationary, the error correction model can be estimated, which represents the short–run dynamics of the model. Thus, this two step procedure covers both long run equilibrium and the short run adjustment process.

The residual–based co-integration tests are inefficient and can lead to contradictory results, especially when there are more than two 1(1) variables under consideration (Pesaran and Paseran, 1997). Therefore,

Johansen (1991) and Johansen and Juselius (1990) tests are used in multivariate cases. These tests are based on the maximum likelihood procedure, and provide a unified frame work for testing of co-integrating relations in the context of vector autoregressive (VAR) error correction models.

Johansen proposes two tests to determine the number of co-integrating vectors. The first is the likelihood ratio test, based on the maximal Eigen value, and the second is the likelihood ratio test based on the trace test. The power of the trace test is lower than the power of the maximal Eigen value test (Johansen and juselius, (1990). If the null hypothesis of non co-integrating vector can be rejected, it indicates that there is long run relationship among the variables in the model. As a result, the error correction mechanism can be presented. The above methods require that the variables in the system be of equal order of integration. These methods do not include the information on structural break in time series data and they also suffer from low power. Due to the problems associated with the standard test methods, the OLS based autoregressive distributed lag (ARDL) approach to co-integraton has become popular in recent years. Hence, equation (9) is estimated using vector autoregressive technique

(a) *ARDL Modeling Approach*: The ARDL modeling approach popularized by Pesaran and Pesaran (1997), Pesanean and smith (1998), Pesanran and Shin (1999) and Pesaran *et al.* (2001), has numerous advantages. The main advantage of this approach lies in the fact that it can be applied irrespective of whether the variables are 1(0) or 1(1) (Pesaran and Pesaran, 1997). Another advantage of this approach is that the model takes sufficient numbers of lags to capture the data generating process in a general-to-specific modeling frame work (Laurence and Chai, 2003). Moreover, a dynamic error correction model (ECM) can be derived from a simple linear transformation (Banerjee *et al.* 1993). The ECM integrates the short run dynamics with the long run equilibrium without losing long run information. It is also argued that using the ARDL approach avoids problems resulting from time series data (Laurenceson and Chai, 2003)

The error correction version of the ARDL model in equation 6 is given as;

$$\Delta(HDI) = \alpha_0 + \Sigma \alpha_1 \Delta TR_{L-1} + \Sigma \alpha_2 \Delta HDI_{t-1} + \Sigma \alpha_3 \Delta RAE_{t-1}$$
$$+ \Sigma \alpha_4 \Delta CAE_{t-1} + \Sigma \alpha_5 \Delta RPi_{t-1} + \Sigma \alpha_6 \Delta TEE_{t-1}$$
$$+ \Sigma \alpha_7 \Delta DUM_{t-1} + \alpha_8 TR_{t-1} + \alpha_9 HDI_{t-1} + \alpha_{10} RAE_{t-1}$$
$$+ \alpha_{11} CAE_{t-1} + \alpha_{12} RPI_{t-1} + \alpha_{13} TEE_{t-1} + \alpha_{14} DUM_{t-1} + E \qquad (9)$$

The First Part of equation 9, with $\alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5, \alpha_6$, and α_7 represents the short- run dynamics of the model, whereas the second part with α_8, α_9, α_{10}, α_{11}, α_{12}, α_{13} and α_{14} represents the long relationship. The null hypothesis in the equation is $\alpha_8 = \alpha_9 = \alpha_{10} = \alpha_{11} = \alpha_{12} = \alpha_{13} = \alpha_{14} = 0$ which means the non existence of the long-run relationship.

(b) *ARDL Model Testing Procedure*: The first step in the ARDL bounds testing approach, is to estimate equation (9) by ordinary least squares (OLS). In order to test for the existence of a long-run relationship among the variables, by conducting an F- test for the joint significance of the coefficients of lagged values of the variables, i.e, $\alpha_8 = \alpha_9 = \alpha_{10} = \alpha_{11} = \alpha_{12} = \alpha_{13} = \alpha_{14} = 0$ against the alternative $\alpha_8 \neq \alpha_9 \neq \alpha_{10} \neq \alpha_{11} \neq \alpha_{12} \neq \alpha_{13} \neq \alpha_{14} \neq 0$. We denote the test which normalize on logarithm of human development index (HDI) by FHDI (HDI/TR, LRAE, LCAE, LPCi, LTEE, DUM). The asymptotic critical values bounds provide a test for cointegration when the independent variables are $I(d)$ (where $0 \leq d \leq 1$); a lower value assuming the regressors are $I(0)$ and an upper value assuming purely $I(1)$ regressors. If the F statistics is above the upper critical value, the null hypothesis of no long-run relationship can be rejected irrespective of the orders of integration for the time series.

The ARDL method estimates $(P+I)^k$ of regressions in order to obtain optimal lag length for each variable, where P is the maximum number of lags to be used and k is the number of variables in the equation. The model is selected using Akaike's information Criteria (AIC) is known for selecting the maximum relevant lag length.

In the second step, the long-run relationship is estimated using the selected ARDL Model. When there is a long-run relationship between variables, there exists an error correction representation. Therefore, in the third step, the error correction model is estimated. The error correction model result indicates the speed of adjustment back to the long-run equilibrium after a short-run shock.

To ascertain the goodness of fit of the ARDL model, the diagnostic test and stability test is conducted. The diagnostic test examines the serial correlation, functional form, normality and heteroscedasticity associated with the model. The structural stability test is conducted by employing the cumulative sum of recursive residuals (CUSUM) and the Cumulative Sum of recursive residuals (CUSUMQ). Examining the prediction error of the model is another way of ascertaining the reliability of ARDL Model. If the error or

the difference between the real observation and the forecast is infinitesimal, then the model can be regarded as best fitting.

5. EMPIRICAL ANALYSIS

5.1 Unit Root Tests: Before we proceed with the ARDL bound test, we test for the stationarity status of all the variables to determine their order of integration. This is to ensure that the variables are not $I(2)$ stationary so as to avoid spurious results. Bound test is based on the assumption that variables are $I(0)$ or 1(1). Therefore, the implementation of unit root test in the ARDL procedure might still be necessary in order to ensure that none of the variables is integrated of order 2 or beyond.

We applied a more efficient univariate DF-GLS test for autoregressive unit root recommended by Elliot, Rothenberg and stock (1996). The test is a simple modification of the conventional Augmented Dickey–Fuller (ADF) t-test as it applies generalized least squares (GLS) detrending prior to running the ADF test regression. Compared with the ADF tests, the AD-GLS test has the best overall performance in terms of sample size and power. It has substantially improved power when an unknown mean or trend is present. (Elliot, Rothenberg, and Stock, 1996). The test regression included both constant and trend for the lag levels and a constant with no trend for the first differences of the variables.

The DF-GLS Unit Root test results for the variables reported in Table 1 indicate that all variables are 1(1). We rejected the null hypothesis of unit root process in all cases, based on the Akaike Information Criteria (AIC) test from the unit root test regression results.

Table 1
DF-GLS unit root tests on Variables

Variable at levels	AIC Lags	DF GLS Stat.	Variable at 1st diff	AIC Lags	DF GLS	I (d)
LHDI	0	-1.211	LHDI	0	-8.321**	I (d)
LTR	4	-2.131	LTR	2	-3.412**	I (1)
LRHE	2	-1.411	LRAE	1	-4.493**	I (1)
LCAE	1	-2.49	LCAE	2	-5.339**	I (1)
LRPI	2	-1.326	LRPI	1	-3.392**	I (1)
LTEE	3	-1.441	LTEE	1	-4.031**	I (1)

All variables are in lags. The DF-GLS statistics are compared to the critical values from the Mckinnon table in ERS (1996, Table 1, page 825). ** denotes the rejection of the null at 5% significance level. L, represents logarithm, while the variables are as previously defined.
Source: Author's Computation.

5.2 Bounds test for Co-integration: In the first step of the ARDL analysis, we tested for the presence of long run relationships in equation (9). We used a general–to–specific approach, guided by the short data span and AIC, respectively, to select a maximum–lag order of 2 for the conditional ARDL-VECM. First, an OLS regression was estimated for the first difference part of equation (9) and then tested for the joint significance of the parameters of the lagged level variables when added to the first regression. The F-Statistic tests the joint null hypothesis that the coefficients of the lagged level variables are zero (i.e. no long- run relationship exists between them). Table 2 reports the relationship of the calculated F-Statistics when each variable is considered as a dependent variable (normalized) in the ARDL–OLS regressions.

Table 2
Results from bound tests on equation (9) by excluding EC variable

Dependent Variables	AIC lags	F-Stat.	Prob.
F_{LHDI}(LHDI/LTR, LRAE, LCAE, LRPI, LTEE, DUM)	2	2.734	0.090**
F_{LTR}(LTR/LHDI, LRAE, LCAE, LRPI, LTEE, DUM)	2	1.891	0.082***
F_{LRAE}(LRAE/LTR, LHDI, LCAE, LRPI, LTEE, DUM)	2	21.344	0.000**
F_{LCAE}(LCAE/LTR, LRAE, LHDI, LTEE, DUM)	2	1.639	0.002***
F_{LRPI}(LRPI/ LTR, LRAE, LCAE, LHDI, LTEE, DUM)	2	2.521	0.006*
F_{LTEE}(LTEE/LTR, LRAE, LCAE, LRPI, LHDI, DUM)	2	0.211	0.321
F_{DUM}(DUM/LTR, LRAE; LCAE, LRPI, LTEE, LHDI	2	0.821	0.532

*, **, ***, denotes significant at 1, 5, and 10 percent respectively
Source: Author's computation.

The calculated F-Statistics F_{LHDI}(LHDI/LTR, LRAE, LCAE, LRPI, LTEE, DUM) = 1.732 is higher than the upper bound critical value at the 5% level. Thus, the null hypothesis of no cointegration is rejected, implying long run cointegration relations amongst the variables, when the regressions are normalized on LHDI variables (Table 2)

5.3 Long–run Static Regression of Human Development Index: The total number of regressions estimated following the ARDL. Method in equation (9) is $(4 + 1)^6 = 15625$. The model selected by AIC is (0, 2, 3, 0)

Table 3
ARDL (0, 2, 3, 0) Model long-run results

Variable	Coefficient	Std Error	t–statistic
LTR	-0.003	0.052	-0.058
LRAE	0.213	0.023	9.261**
LCAE	0.436	0.231	1.887**
LRPI	0.212	0.011	1.927**
LTEE	-0.021	0.331	-0.063
DUM	-0.632	0.249	-2.538**
C	-0.008	0.031	-0.258

** denotes significant at 5% while, L represents the logarithm of the various variable as earlier defined. LHDI is the dependent variable.
Source: Author's computation.

The long-run test statistics (Table 3) reveal that recurrent administrative expenditure (LRAE), Capital administrative expenditure (LCAE), real per capita income (RPI) and the structural break factor, (DUM) are the key determinants of human development index. The coefficients of these variables stood at 0.213 for LRAE, 0.436 for LCAE, 0.312 for LRPI and -0.632 for DUM and they are all statistically significant at 5 %. Specifically, the coefficient of LRAE suggests that in the long run, an increase of 1 percent in recurrent administration expenditure is associated with an increase of 0.21 percent in human development index. LCAE and LRPI had similar positive impact on HDI. The regime type coefficient, though significant, has a negative impact on HDI, suggesting that, transition from military to civilian regime since 1999 has little or no impact on the general well being of the masses.

The coefficients of total federal government revenue and expenditure stood at -0.003 and 0.021 respectively and unfortunately, they are statistically insignificant. This further lend credence to the fact that the ever increasing federal government budgets over the years do not translate to more goods and services for the people, rather they find their way to private pockets. Adebiyi, (2007), had similar results.

To further verify the effect of cost of governance on human development index, (HDI) the paper estimates the error correction version of ARDL is estimated for equation (9).

5.4 Short Run Parsimonious Welfare Model: In order to capture the short–run deviations that might have occurred in estimating the long-run cointegrating equation; a dynamic error-correction model is estimated in Table 4.

Table 4
(0, 2, 3, 0) model ECM results

Variable	Coefficient	Std. Error	t- stat.
Δ(LHDI (-1),1)	0.166	0.062	2.681**
Δ(LTR (-1),1)	0.096	0.082	1.200
Δ(LRAE (-1),1)	0.004	0.015	0.256
Δ(LCAE,1)	- 0.067	0.127	- 0.530
Δ(LRPI (-1),1)	- 0.101	0.044	- 2.282**
Δ(LTEE, 1)	0.030	0.041	0.735
Δ(LTEE (-1),1)	0.215	0.695	1.310
Δ(DUM,1)	- 0.010	0.022	- 0.475
Δ(DUM (-1)1)	- 0.169	0.082	- 2.044**
ECM (-1)	- 0.044	0.015	- 2.940**
C	6.032	1.570	3.845**

** Significant at 5 %
Dependent Variable; Δ(LHDI, I)
Method: least squares
Sample (adjusted) 1990 Q1- 2009 Q4
Included observations 80 after adjusting end points
Source: computed by author.

The dynamic model as shown in Table 4 indicates that most of the cost indicators are insignificant, while others are negative contrary to theoretical expectation. This is not unexpected as most administrative expenses in Nigeria do not translate to good governance through the provision of infrastructure that impact directly on the welfare of the people. The negative coefficient of capital administrative expenditure of 0.062 further demonstrate that as more funds are made available for the ruling class, the masses welfare indicators depreciate further. Also, this negative coefficient is significant at 5 percent.

The regime type proxy by a dummy was not an exception. Its coefficient of −0.169 (−2.044) clearly indicates that with the political transition since 1999, the general welfare of the people still remained a big question. Recurrent administrative expenditure (LRAE) has the expected sign. Unfortunately, its coefficient of 0.004 is not significant at 5 percent. ·

The ECM which is −0.004 was highly significant and had the appropriate sign. It suggests however, a slow adjustment process as only 4 percent disequilibrium in human development Index of the previous quarter shock adjust back to the long run equilibrium in the current quarter. It is also a confirmation that, indeed human development index–a measure of standard of living and administrative expenditure are co-integrated.

5.5 Diagnostic Test: To confirm the robustness of the model, the paper performs diagnostic tests as shown in Table 5

Table 5
Key Regression Statistics and diagnostic Statistics

| R–squared	0.621	Mean dependent var.	6.602
Adjusted R-Squared	0.582	S.D dependent var.	0.162
S.E of Regression	0.030	Akaike inform. Criterion	- 3.489
Sum Squared Residual	0.199	Schwarz criterion	- 3.209
Log likelihood	241.531	F- Statistic	192.082
Durbin Watson Stat.	1.941	Prob. (F-statistic)	0.021

Serial correlation F (6.72) = 0.461 (0.411)
Normality 2 (2) = 9.903 (0.000) (0.006)
Heteroscedasticity F (7.72) = 1.334 (0.192)
ARCH Test F (1.05) = 0.211 (0.411)

The dynamic model diagnostic tests show that the explanatory variables account 62 percent of the variation in the Nigerian Welfare Index. Thus, the overall goodness of fit of the model is relatively satisfactory though some of them are not of the expected signs as earlier discussed. The Akaike information criteria and Schwarz Criterion show that the model is correctly specified. F–Statistics measuring the joint significant of all regression in the model is statistically significant at the 5 percent. Similarly, the Durbin-Watson statistics is almost 2. The model passes the normality test. The result shows that there is no serial autocorrelation and heteroscedasticity in the model.

Fig 1
Actual and Predicted changes in the HDI
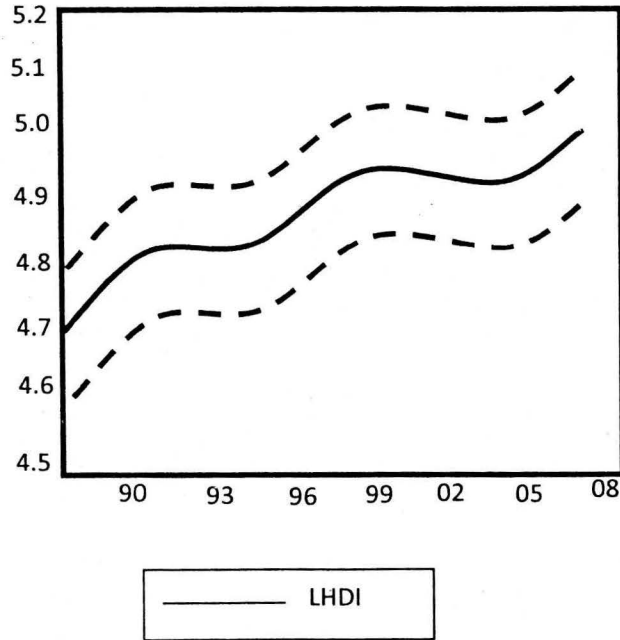
Forecast:	LHDIF
Actual:	LHDI
Forecast sample:	1990:1–2009:4
Included observation:	80
Root Mean Square Error:	0.032
Mean Absolute Error:	0. 019
Mean Abs. Percent Error:	0. 216
Theil inequality Coefficient:	0. 002
Bias Proportion:	0. 061
Variance proportion:	0. 082
Covariance proportion:	0. 699

The forecasting evaluation test as shown by the relatively low value of the root mean squared error of 0.03 is an indication of high forecasting performance of the model. All other indicators such as the Theil Inequality coefficient of 0.002 (Approx; zero) showed a similar picture. The ARDL Model has been shown to be robust against residual autocorrelation. Since the time series in the equation are of the same integration, it is natural not to detect heteroscedasticity. All these are shown in Figure 1.

5.6 Stability Test: Stability test is performed using cummulative Sum (CUSUM) and cumulative sum of square (CUSUM Q) of residual of the ARDL Model as shown in figures 1 and 2. The existence of parameter instability is established if the cumulative sum of the residual goes outside the area between the critical (dotted–bounded) lines. It is estimated at 5 percent critical level. From figure 1 and 2, it can be inferred that the model at 5 percent level of significance has been stable over time.

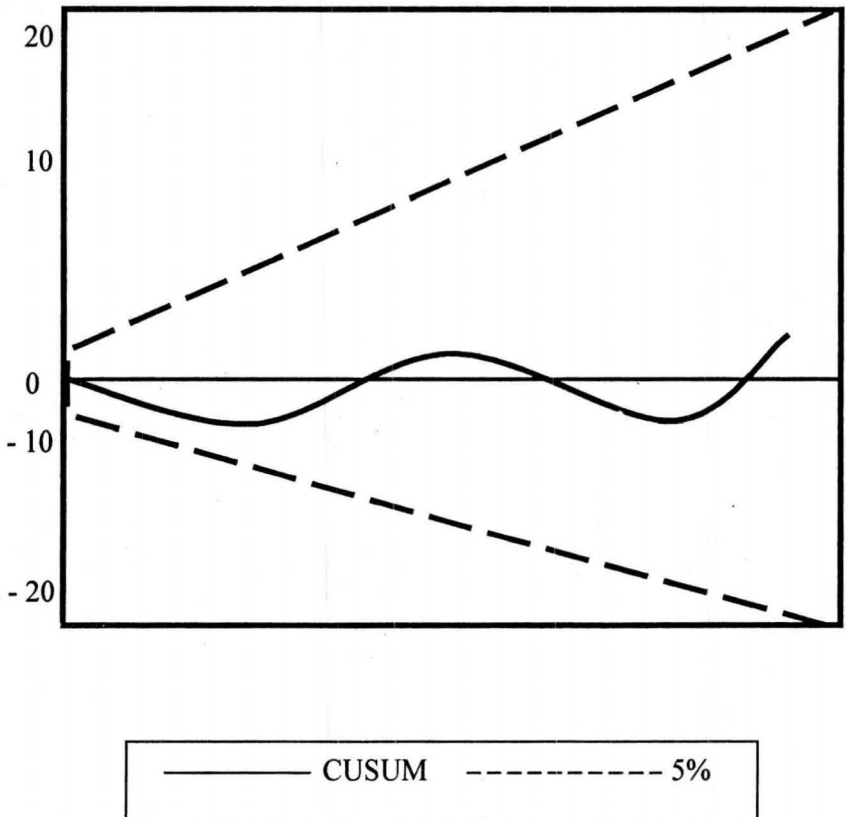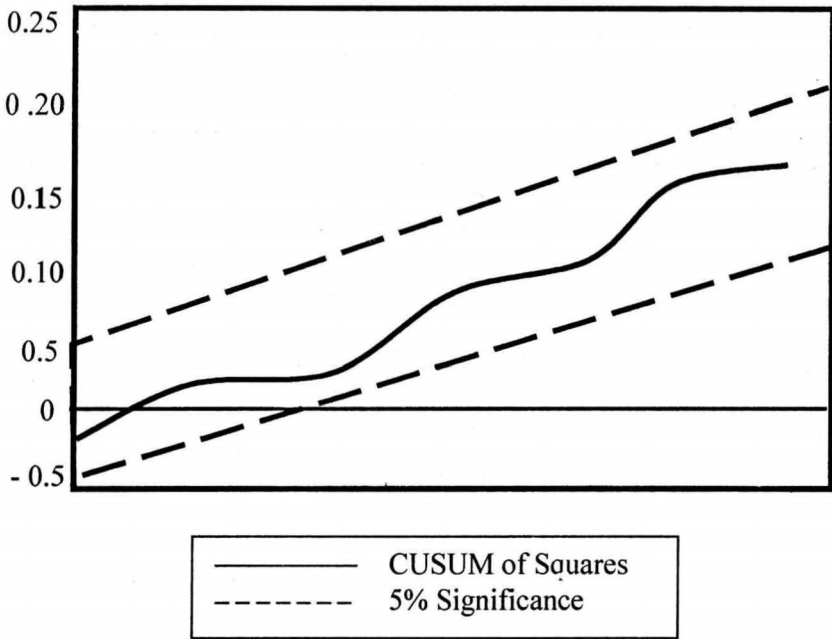**Fig. 2**
Plot of Cumulative sum of Recursive residuals

CUSUM ---------- 5%

Fig. 3
Plot of Cumulative sum of Square of Recursive Results

	CUSUM of Squares
- - - - - - -	5% Significance

6. CONCLUDING REMARKS

This paper attempts to explore the link between cost of governance and welfare issues in Nigeria. We examined the relationships between the variables by analyzing their long-run properties and short- run dynamics. The econometric results from the error correction model show that administrative cost has far reaching impact on the welfare of people in Nigeria as some of the proxies for cost of governance were quite significant.

The negative sign of capital administrative expenditure, per capita income, total expenditure in education and the dummy for regime type show that the increasing cost of governance in Nigeria still falls short of achieving the efficiency and depth of boosting the standard of living of the people over the years. In all, the unexpected signs some of the explanatory variables could be attributed to a myriad of other factors, such as high incidence of corruption in high places without prosecution, unproductive retinue of public officers, sit–tight public officers in the corridor of power, policy inconsistency and policy mortality. Infrastructural failure as well as high risk and insecurity could have their own effects on crowding out investment and consequently, the masses' welfare.

From the foregoing, it is clear that the recent call to review down the welfare packages of public officers that constitute more than 30 percent of the national budget is a step in the right direction. This means that more funds can be made available and channeled to productive use and infrastructural development so as to enhance the standard of living of the people. There is also the need for further fiscal adjustments as well as the development of more people oriented project financing options for the government. Only governance with "*minimum administrative Cost*" made up of credible public officers, and dynamic people oriented programmes would there be any hope to alleviate poverty, improve human health, productivity, income and the standard of live of the people in general.

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