Asian Journal of Economics and Empirical Research
ISSN: 2409-2622
Vol. 1, No. 2, 40-47, 2014
http://asianonlinejournals.com/index.php/AJEER

Inbound Tourism and Social Factors in Nigeria: Evidence from an Ardl-Ecm Model

Emmanuel Okokondem Okon
[1]Department of Economics, Kogi State University, Anyiba, Kogi State, Nigeria

Abstract

This paper investigated the relationship between social factors and inbound tourism in Nigeria between 1990 and 2012. Phillip Perron unit root test revealed stationarity of the variables at their first difference while the Autoregressive Distributed Lag (ARDL) bounds testing approach to cointegration also established the long run relationship among the variables. In the short run, LOG(ILL), LOG(CRM(-1))and DLOG(MPR(-1)) exhibited negatively significant relationship with inbound tourism in Nigeria while LOG(URB(-1)) has a positively significant relationship. The long run result indicates that LOG(URB) is positively related with tourism demand (LOG(TAR)). On the other hand, LOG(MPR) shows an inversely significant relationship with LOG(TAR). Nigerian government should still do more in the area of awareness of malaria prevention and compliance. Also, more commitment should be made in fighting illiteracy especially at the rural level.

Keywords: Social factor, Tourism demand, Inbound tourism, Nigeria, Unit root test, Cointegration, Autoregressive distributed lag (ARDL) - ECM model.

1. Introduction

Nigeria, known as the Giant of Africa, is filled with the history of many ethnic groups, beautiful beaches and wonderful natural landscapes. For years, the oil industry has overshadowed any thought of showing off the beauty of Nigeria. However, recently Nigeria has been attempting to slowly turn this sector around and make Nigeria a more accessible and safe place for tourists (Arasi, 2011). In terms of tourism as an economic product, people have a critical central role to play. The richness of a people's cultural heritage, warmth and hospitality must be central to tourism development in Nigeria. When a people are given to reclusive and introversive ways of life, their level of hospitality is likely to be low. Social vices, restrictive cultural practices could considerably reduce a country's ranking as a tourist destination. High theft rate, murder and similar vices are capable of planting scares into the minds of prospective tourists, both local and foreign.

On these indices, Nigeria today does not have a high rating. The over 15 years of military dictatorship has left indelible marks on the psyche of Nigerians (Njoku, 2003). The multiple problems, bottled over the years are now being unleashed on the body polity. The lingering crisis in the oil-rich states of the south of Nigeria, the ethnic conflicts (Tiv-Jukuns, Umuleri-Aguleri, Ife-Modakeke, etc); the restive problem of communities in the Niger Delta; poverty and lack of opportunity for many young people, especially in urban areas, have led to major crime; the recent spate of assassination in the wake of general elections are sour points to mention (Njoku, 2003).

This paper attempts to investigate the effect of different social factors on inbound tourist arrivals in Nigeria. These factors are examined in relation to travel decision making and destination selections (Sirakaya *et al*., 1996). A better understanding of these determinants of tourism demand could help policymakers design the appropriate strategies needed to develop the tourism sector further, and correct these social issues, given the basic objective of making Nigeria the ultimate tourism destination in Africa (Saheed and Egwaikhide, 2012).The paper is structured in the following manner: Following the introduction is the review of related literature in section 2.Section 3 examines some social issues and tourism in Nigeria. Section 4 presents the methodology, analytical framework and model for the study. Section 5 hosts the estimation and discussion of empirical result, while section 6 summarizes the findings, proffers policy recommendations and points out some limitations associated with the study.

2. Literature Review

International tourism demand analysis has been discussed broadly; even comprehensive reviews have also been delivered by several scholars (Crouch, 1994a;1994b; Lim, 1997; Song and Witt, 2000; Li and Song, 2007). These reviews indicate the main determinants in international tourism demand analyses from 1960s to the beginning of 2000s were predominated by income of origin countries, relative prices, substitute prices, travel costs, exchange rates, and time disturbance dummy variable. (Crouch, 1994a) observed 'dummy variables mostly represent political

* *Corresponding Author*

unrest, terrorism, limitation of foreign spending, special occurrence, and other transitory disturbances that are difficult to quantify'. Furthermore explanation related to the relationship of three most applied explanatory variables, namely income of origin country, tourism price/relative price and transportation cost is delivered by Lim through her meta-analytical study. Income and tourism price relationship to international tourism demand are founded following microeconomic consumption theory, where income has a positive relationship while tourism price has a negative one. Unlike the other two explanatory variables, she found transportation cost had less clear relationship to international tourism demand (Lim, 1999).

Demand of international tourism can be explained by various potential factors (Song and Witt, 2000). Besides income and price, as demand theory suggested, abundance of explanatory variables is utilized in the existing empirical studies depending on the research objectives. Among the increasing interest in international tourism assessments is examining the role of economic, social and political conditions in the destinations. Among others, Narayan (2004) and Oh (2005) find economic growth strongly lead to tourism development in the case of Fiji and Korea, respectively (Sinclair, 1998) mentioned that the conditional differences between developing and developed country make a difference in term of benefiting tourism.

3. Tourism and Social Issues in Nigeria

The Nigerian tourism sector is structurally faulty and in need of a coherent modification plan, this is based on the fact that the sector has only been able to attract tourist from low income countries, thereby exacerbating its low tourism receipts. In 2005, Nigeria received more than 2.7 million tourists (Peter, 2011). The largest contingents came from Niger(620,658), Benin (393,215), Liberia (107,401), and Cameroon (107,108) (Library of Congress, 2008). According to Fapohunda (1975), the informal economy is estimated to range between50 to 75 percent of the total economy. Hence most segments of the sector are swallowed in the pervasive underground economy in Nigeria; this has rendered this vital sector out of government control and regulation. Thus tourists are left at the mercy of crooks and goons. However, globally, the number of tourist arrivals has been increasing, and Nigeria has been getting its own fair share, going with the World Bank, international tourist arrivals increased from 1010000 in 2005, to 1111000 in 2006, to 1212000 in 2007 and 1313000 in2008 (Peter, 2011). The UNWTO records show that in 2009 international arrivals was 1414000, also for 2010 the organization claims that arrivals increased by 7 percent in Nigeria (Peter, 2011). See Table 1 in Appendix for tourist attraction in Nigeria.

Although Nigeria's GDP per capita has been increasing through the course of time in nominal US dollar terms, many Nigerians are still living in poverty (Ucha, 2010). Obviously, the average income per capita does not give the real picture due to Nigeria's high income inequality. According to the World Resources Institute's environmental resource portal *Earth Trends*, about 71 percent of Nigerians live on less than $1 a day and about 92 percent live on less than $2 a day. It is clear that given the rich natural resources, the level of poverty in Nigeria is remarkably high and in addition, the country ranks third in the world for the most people living with HIV/AIDS and has the third highest death rate as a result of HIV/AIDS (CIA, 2011). Nigeria's infant mortality rate has been estimated to be currently 99 per 1000 births, which implies that Nigeria has the thirteenth highest infant mortality rate in the world (CIA, 2011). The infant mortality of children under the age of 5 was 189 per 1000 births in 2007. These high mortality rates are mostly due to mothers not having enough money to take care of their children. Many mothers are also ignorant of some preventive measures such as immunizations and vaccines. The immunization rate against diphtheria, pertussis and tetanus (DPT) for children between 12-23 months was about 54 percent in 2007. Many children in Nigeria die as a result of malaria, diarrhea, tetanus and similar diseases. Most of these are preventable and curable diseases, but due to inadequate health care facilities and lack of money far too many children die off from them. Like the grown-up population, many children also lack access to safe water and sanitation, which typically leads to several diseases.

When compared to Sub-Saharan Africa, Nigeria seems to be better off in a few economic and social aspects but worse off in most. This is illustrated with some selected economic and social data in Table 2 (see Appendix).

4. Methodology

According to (Crouch, 1994a; 1994b) and Lim (1997), international tourism demand variables are often represented by the number of tourist arrivals and departures, the expenditures and receipts of tourism sector and tourist-nights and the average length-of-stay.

Due to lack of monthly data disaggregating tourists by purpose of visit and country of origin, this paper will only examine tourism demand international tourist arrivals to Nigeria from all countries rather than from a particular country of origin. Since single-equation estimation still provides useful insights to factors that influence international tourism demand and remains the most widely used estimation framework. This study adopted a single-equation framework to analyze international tourism demand for Nigeria. Only social factors that are perceived to be of risk to tourists and can influence the decision to travel to Nigeria are considered. To account for the dynamics of the tourist's decision-making process, the autoregressive distributed lag model and cointegration/error correction models were adopted.

4.1. Model Specification and Estimation Technique

To investigate the effect of different social factors on inbound tourist arrivals in Nigeria, the following demand function is specified:

$$TAR = f(URB, ILL, PVL, UMP, CRM, MPR) \quad \ldots\ldots\ldots\ldots (1)$$

where, TAR, is tourist arrivals (or demand) from other countries to Nigeria; URB means urbanization rate which is usually an indicator of development in a country; ILL is the inability to meet a certain minimum criterion of reading and writing skill; UMP is unemployment rate i.e., the percentage of the labor force that is without jobs in the

country; PVL is poverty level, i.e., population below poverty line; CRM is the crime rate which is proxy by kidnapping in the country, i.e., offences against persons; MPR is prevalence of malaria (per 100,000). Malaria has been identified as a health risk that lowers tourism (Gallup and Sachs, 2000). The apriori expectation is negative coefficient for most of the variables except for URB (urbanization rate).

Following a double-log transformation of equation (1), the ARDL- error correction model is given as:

$$InTA_t = \acute{\varepsilon}_0 + \Sigma^{p}_{i-1}\pi InTA_{t-1} + \Sigma^{p}_{i-1}\alpha InURB_{t-1} + \Sigma^{p}_{i-1}\gamma InLTR_{t-1} + \Sigma^{p}_{i-1}\mu InPVL_t + \Sigma^{p}_{i-1}\chi InUMP_t + \Sigma^{p}_{i-1}\mathit{Ж} InCRM_{t-1} + \Sigma^{p}_{i-1}\psi InMPR_t + \varphi_1 InTA_{t-1} + \varphi_2 InURB_{t-1} + \varphi_3 InLTR_{t-1} + \varphi_4 InCRM_{t-1} + \copyright \quad \ldots\ldots\ldots\ldots..(2)$$

Where: π α, γ, μ, χ, *Ж and* ψ *are the short run dynamic coefficients of the ARDL model;* ϕ *=1,2,3 and 4 are the long run multipliers and p is the optimal lag length.*

5. Estimation and Discussion of Empirical Result

The result of unit root test based on Phillip Perron tests is presented in Table 3 (see Appendix). All the variables under scrutiny were I(I) process, which means that they are stationary at first difference. This result is particularly important in that it confirms the use of the ARDL bounds testing approach that is applied as the most appropriate and useful cointegration procedure in the context of this paper. Regarding the bounds test, first, the double-log transformation of equation (1) was estimated. The purpose was to establish the long run relationship among the variables. Next, the short-run dynamics of the ARDL-ECM is estimated. The calculated F-statistics for the long run model and short run error correction model is presented in Table 4. The critical values are based on critical values reported in Pesaran *et al.* (2001).

Table-4. F-statistics for Testing for the Existence of Long Run Relationship

Computed F-statistics (long run model)	41.21571
Computed F-statistics error correction model	93.93288
Bound Testing Critical Value	5% lower (2.365); upper (3.553)

Source: Computational results using Eview 7.0
The critical values are taken from Pesaran *et al.* (2001), unrestricted intercept and no trend with seven variables at 1 per cent is 3.027 to 4.296; at 10 per cent are 2.035 to 3.153.

The calculated F-statistics for the long run model is 41.22 and that of the short run model is 93.93. These values are higher than the upper and lower bound critical values at 5 per cent levels of significance. This implies that the null hypothesis of no co-integration cannot be accepted at 5 per cent and 10 per cent levels of significance and therefore, there is a long run relationship among the variables under scrutiny.

The long run result (see Table 5 in Appendix) indicates that LOG (URB), LOG (UMP) and LOG (MPR) are significant social factors influencing tourism demand in Nigeria. A closer examination reveals that LOG (UMP) does not conform to economic expectation. However, a 1 per cent increase in LOG (URB) leads to 1.006102 per cent increase in tourism demand and statistically significant at 5 per cent level. On the other hand, LOG (MPR) shows an inverse relationship with LOG (TAR). A one per cent increase in LOG (MPR) leads to 0.466424 decrease in tourism demand (LOG (TAR)). This result shows statistical significance at 1 per cent level.

A highly significant error correction term is a strong confirmation of the existence of a stable long run relationship as observed by Gujarati (2004). As such, the paper proceeds to estimate the error correction model following the estimation of the long run coefficients. The paper adopts the general to specific approach (see Table 6 in Appendix) to arrive at the parsimonious (see Table 7 in Appendix) estimate by eliminating jointly insignificant variables. The result indicates that LOG(UMP), LOG(ILL), DLOG(TAR(-1)), LOG(URB(-1)), LOG(CRM(-1)), DLOG(MPR(-1)), DLOG(UMP(-1)), DLOG(TAR(-2)) and DLOG(ILL(-1)) are significant social factors influencing tourism demand in Nigeria in the short run. A closer look at the result in Table 7 (see Appendix) reveals that LOG(UMP), DLOG(TAR(-1)), DLOG(UMP(-1)), DLOG(TAR(-2)) and DLOG(ILL(-1)) are contrary to economic expectation. However, LOG(ILL), LOG(URB(-1)), LOG(CRM(-1)) and DLOG(MPR(-1)) are the few variables which do not only conform to apriori economic expectations but are also statistically significant at 1 and 5 per cent levels of significance. Their statistical significance strongly suggests that a 1 per cent increase in LOG (ILL), LOG (CRM (-1)) and DLOG (MPR (-1)) leads to about -0.453687, -0.155721 and -1.228129 per cent decline in tourism demand respectively. However, a 1 per cent increase in LOG (URB (-1)) results to a 4.622329 increase in tourism demand (LOG (TAR)).

The result of the error correction model indicates that the ECM1 variable is statistically significant but does not have the correct apriori sign. However, ECM 2 does have the expected negative sign. In particular, about 229 per cent of disequilibrium from long run tourism demand in the previous two periods is corrected in the current year. That shows a high level of convergence. The Durbin Watson (DW) statistics value of 1.8 shows the absence of first order serial autocorrelation in the model. The value of adjusted R^2 of 0.98 indicates a good fit. In particular, the model explains about 98 per cent of total variations of the dependent variable around its mean.

5.1. Diagnostic Test

The stability of the model is tested using the standardized residual chart and confidence ellipse. From the standardized residual graph (see Figure 1 in Appendix), it is apparent that the model is averagely stable across time

and space. Nonetheless, there are few periods that the oversight of the union exceeds the residual limit; however, these occurrences are insignificant.

The confidence ellipse in figure 2 were made on a 4-basis points to capture the stability effects of the quadrants of the square box, from the chart it is seen that the ellipse were saturated within the confidence square box signifies which the stability of the overall specification of the model. Nonetheless, there are some cases that the ellipses were not saturated within the confidence square box; however, these occurrences are still negligible.

In Table 8 (see Appendix), almost all of the centred variance inflation factor (VIF*)* are less than 10, suggesting that a low degree of multicollinearity is present. On the other hand, the uncentred VIF showed some of the variables with values greater than 10, indicating a severe multicollinearity. The forecast for the dependent variable indicates constancy throughout the sample period (see Figure 3 in Appendix). This is because it stayed within the plus and minus two standard errors (2.S.E line).

6. Summary, Conclusion and Policy Recommendations

This study attempted to investigate the impact of social factors on inbound tourism in Nigeria from 1990 to 2012. The result of the unit root test showed that the variables are stationary at first difference, thus warranting the adoption of bounds testing approach to cointegration. The long run result indicates that LOG (URB), LOG(UMP) and LOG(MPR)are significant social factors influencing tourism demand in Nigeria. In the short run, LOG(UMP), LOG(ILL), DLOG(TAR(-1)), LOG(URB(-1)), LOG(CRM(-1)), DLOG(MPR(-1)), DLOG(UMP(-1)), DLOG(TAR(-2)) and DLOG(ILL(-1)) are significant social factors influencing tourism demand in Nigeria.

Based on the findings, Nigerian government should adopt an integrated approach to the provision of water, electricity, sanitation, drainage and solid waste management in urban area**.** Similarly, private sector and community participation in urban renewal activities, housing and infra-structural provision should be encouraged. Though Nigeria is making a big investment in malaria, it should still do more in the area of awareness of malaria prevent and compliance; and intensification of the fight against fake malaria drugs.

Adequate operational facilities should be given to the police force to assist in their fight against kidnapping and other criminal activities. This can be complemented by effective community policing in the country. In addition, the joint security forces should be given free role to report and destroy kidnapper's hideouts. When they are rendered homeless, it will be difficult for them to carry-out their regular criminal operations. Information is power, as such; the media should be encouraged to organize more public programs against kidnapping and other crimes. When adequate information is given about the various measures to curb kidnapping, it could serve as threat to the perpetrators.

More commitment should be made to fight illiteracy in Nigeria especially at the rural level. This is because illiteracy is much greater in rural areas than in urban areas. In the same vein, there is need to raise national awareness on girl-child education and increasing political and financial commitment through advocacy and sensitization of policy makers at all levels, parents, school authorities, other leaders and girls themselves.

Given the fact that the size of the sample in this study is relatively small, the degree of freedom in the model estimation is consumed and data were not adequate on some specific variables such as terrorist casualties and incidents that would have made the study more policy relevant. While the study gives some useful guidance to policy makers, a number of points could be clarified by further work, and this should give greater specificity to policy guidelines. A primary suggestion for future research is that the tourism demand model should be expanded to accommodate other variables as a means to greater understanding of the tourism industry in Nigeria. In addition, more advanced econometric measures than those used in this paper should be employed, to more accurately capture the nature of any effect on tourism demand, and what sources contribute to that effect.

References

Arasi, T., 2011. Nigeria's tourism problem. Africa. Available from http://nyuiba.com/ibj/2011/02/nigerias-tourism-problem/.

CIA, 2011. The world factbook: Location (A Webpage of Central Intellegent Agency). Available from https://www.cia.gov/library/publications/the-world-factbook/fields/2144.html [Accessed 04/30 2011].

Crouch, G.I., 1994a. The study of international tourism demand: A review of findings. Journal of Travel Research, 33(1): 12.

Crouch, G.I., 1994a;1994b. The study of international tourism demand: A review of findings. Journal of Travel Research, 33(1): 12.

Crouch, G.I., 1994a; 1994b. The study of international tourism demand: A survey of practice. Journal of Travel Research, 23(4): 41-55.

Fapohunda, O., 1975. Urban development, income distribution and employment in Lagos. Working Paper. Geneva: ILO.

Gallup, J.L. and J.D. Sachs, 2000. The economic burden of malaria, CID Working Paper No.52, Harvard University.

Gujarati, D.N., 2004. Basic econometrics. 4th Edn.: McGraw-Hill.

Li, G. and H. Song, 2007. Tourism demand modellingand forecasting - a review of recent research. Tourism Management, 29(2): 203-220.

Library of Congress, 2008. Country profile: Nigeria. Federal Research Division. Available from http://lcweb2.loc.gov/frd/cs/profiles/Nigeria.pdf.

Lim, C., 1997. Review of international tourism demand models. Annals of Tourism Research, 24(4): 835-849.

Lim, C., 1999. A meta-analytic review of international tourism demand. Journal of Travel Research, 37(3): 273-284.

Narayan, P.K., 2004. Economic impact of tourism on fiji's economy: Empirical evidence from the computable general equilibrium model. Tourism Economics, 10(4): 419-433.

Nigeriasite.Com, 2002. Tourist site. Available from http://www.nigeriasite.com/touristsite.html.

Njoku, P.C., 2003. Government policies and their effects on tourism development in Nigeria. Department of special projects and services, National Universities Commission ABUJA. Available from http://placidnjoku.com/Government%20Policies%20and%20Their%20Effects%20on%20Tourism.htm.

Oh, C., 2005. The contribution of tourism development to economic growth in the Korean economy. Tourism Management, 26(1): 39-44.

Pesaran, M.H., Y. Shin and R.J. Smith, 2001. Bound testing approaches to the analysis of level relationships. Journal of Applied Econometrics, 16(3): 289-326.

Peter, A.A.N., 2011. Nigerian tourism sector and the impact of fiscal policy: A case study of the 2000-2009 federal budgets. Being a project submitted in partial fulfillment of the requirement for the award of a bachelor of science (B.Sc.) Degree in the Department of Economics, Faculty of Social Sciences, University of Jos, Plateau State, Nigeria. Available from http://www.slideshare.net/attahpeter/the-nigerian-tourism-sector-and-the-impact-of-fiscal-policya-case-study-of-2000-2009-federal-budgets.

Saheed, Z.S. and C.I. Egwaikhide, 2012. Impact of social crises on economic development: Theoretical evidence from Nigeria. American International Journal of Contemporary Research, 2(6): 176-864.

Sinclair, M.T., 1998. Tourism and economic development: A survey. The Journal of Development Studies, 34(5): 1-51.

Sirakaya, E., R.W. McLellan and M. Uysal, 1996. Modeling vacation destination decisions: A behavioral approach. Journal of Travel and Tourism Marketing, 5(1): 57–75.

Song, H. and S.F. Witt, 2000. Tourism demand modeling and forecasting: Modern econometric approaches. 1 Edn., Oxford: Pergamon.

Ucha, C., 2010. Poverty in Nigeria: Some dimensions andcontributing factors. Global Majority E-Journal, 1(1): 46-56.

World Bank, 2008. Nigeria at a glance. Available from http://devdata.worldbank.org/AAG/nga_aag.pdf.

Table-1. Tourist Attractions in Nigeria

ABIA STATE Tourist centres include the National War Museum, Umuahia, the Azumini Blue River, Ukwa East, and the Long Juju of Arochukwu.
ADAMAWA STATE It has historical places of interest like the Lamido's palace (the seat of Emir of Adamawa in Yola, Old Palace of Harriman Yaji at Madagali German rule, German Rest House at Kowogol) and a host of other places of interest.
AKWA IBOM STATE Notable among the tourist attraction are the Ibeno Beach which stretches over 330 km along the Atlantic Coast line of the State with excellent opportunities for water sporting. Others include the Mobil Tank Farm, the Oron Museum, theIbom Connection etc.
BAUCHI STATE Tourist attraction include the Yankari Game reserve, Premier Game Reserve, Rock Paintings at Goji and Shira, the State Museum among others.
BAYELSA STATE Tourist attractions include its numerous beaches, fishing festivals, the canoe war displays and boat regattas and dances.
BORNO STATE Tourist attractions include the Kyarimi Park in Maiduguri for animal and bird lovers and where the only captured hippopotamus in West Africa is harboured, the Shehu's Palace, Rabeh's Fort at Dikwa, Yamtarawala tomb at Biu. Others are Lake Chad, Sambissa Game Reserve and Jaffi falls among others.
CROSS RIVER STATE The important tourist attractions are Obudu Cattle Ranch, Obudu, Old Residency Museum, Calabar, Agbokin Waterfalls, Ikom, Etanpim Cave, in Odukpani local government area and Mary Slessor's Tomb, Calabar, Cross River National Park and Kwa Falls in Akamkpa local government area, Obubra Lake, Obubra and the Calabar Cenotaph, Calabar. Beaded works which are a peculiarity of Cross River State are sold in crafts shops. Common works are beaded bags, beaded wall hangings, shoes, Ekpe masquerade made with rafia, cane chairs, brass trays, rafia clocks, motif work and a lot more.
EBONYI STATE There tourist attraction in the state include: the Ndibe Beach at Afkpo, Uburu Salt Lake, Uburu, Ishiagu Pottery works, Ishiagu.
EDO STATE Edo State has a rich cultural heritage. Benin City, the state capital is famous for its unique bronze, brass and ivory works of arts which are found all over the world in museums. Tourist attractions in the State are the Royal Palace of Benin, Benin Museum, Benin Moat (Iya), Emotan Status, Somorika Hills in Akoko-Edo. Others are Udo Tourist Centre in Esan East local government area and Okomu Wildlife Sanctuary near Benin City.
EKITI STATE Ekiti State is a popular tourist haven. The popular Ikogosi Warm Spring Resort is located in Ikogosi, Ekiti. Other tourist attractions are Arinta Water falls, Ipole-Iloro, Olosunta Hills, Ikere-Ekiti, Fajuyi Memorial Park, Ado-Ekiti, Ero Dam, Ikun-Ekiti, Egbe Dam, Egbe-Ekiti and Natural Caves in Ikere-Ekit. Closely linked to the tourismpotencial of the state is the festivals that are held seasonally.

Source: Nigeriasite.Com (2002).

Table-2. Selected Poverty and Social Data for Nigeria and Sub-Saharan Africa

	Nigeria	Sub-Saharan Africa
Basic Data (2007)		
Population, mid-year (millions)	148	800
GNI per capita (Atlas method, US $)	920	952
GNI (Atlas method, US $)	136.3	762
Average Annual Growth (2001-2007)		
Population (%)	2.4	2.5
Labor Force (%)	2.5	2.6
Other Indicators (2001-2007)		
Life expectancy at birth (years)	47	51
Infant mortality (per 1000 live births)	99	94
Child Malnutrition (% of children under 5)	27	27
Access to an improved water source (% of population)	47	58
Literacy (% of population age 15+)	69	59
Gross primary enrollment (% of school-age population)	96	94
Male	105	99
Female	87	88

Source: World Bank (2008)

Table-3. Phillip -Perron Test

Variables	Levels	1st Difference	Order of Integration
TAR	-	-6.468075*	I(1)
CRM	-	-7.160327*	I(1)
MPR	-	-4.262807*	I(1)
UMP	-	-4.504039*	I(1)
PVL	-	-5.584180*	I(1)
ILL	-	-4.717893*	I(1)
URB	-	-5.431349*	I(1)

Source: Computational results using Eview 7.0
N/B * significant at 1%; ** significant at 5%; and ***significant at 10%

Table-5. Long run Result (dependent variable :LOG(TAR)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	15.35294	1.681768	9.129045	0.0000
LOG(URB)	1.006102	0.454069	2.215744	0.0416
LOG(PVL)	0.074487	0.115350	0.645745	0.5276
LOG(UMP)	0.125522	0.025464	4.929367	0.0002
LOG(CRM)	-0.031426	0.022954	-1.369090	0.1899
LOG(MPR)	-0.466424	0.111022	-4.201194	0.0007
LOG(ILL)	0.059563	0.225584	0.264038	0.7951
R-squared	0.939231	Mean dependent var		13.72990
Adjusted R-squared	0.916443	S.D. dependent var		0.261562
S.E. of regression	0.075608	Akaike info criterion		-2.080732
Sum squared resid	0.091464	Schwarz criterion		-1.735146
Log likelihood	30.92841	Hannan-Quinn criter.		-1.993818
F-statistic	41.21571	Durbin-Watson stat		2.307907
Prob(F-statistic)	0.000000			

Source: Author's calculation using Eviews 7.0

Table-6. Overparametized Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.567778	3.048189	2.810777	0.0672
LOG(URB)	0.628280	0.731649	0.858717	0.4536
LOG(PVL)	0.032546	0.153787	0.211629	0.8460
LOG(UMP)	0.075020	0.032254	2.325876	0.1025
LOG(CRM)	-0.004076	0.039271	-0.103781	0.9239
LOG(MPR)	0.062546	0.161131	0.388167	0.7238
LOG(ILL)	-0.242887	0.366927	-0.661951	0.5553
DLOG(TAR(-1))	-2.931149	0.800881	-3.659907	0.0352
LOG(URB(-1))	4.374084	1.028130	4.254407	0.0238
LOG(CRM(-1))	-0.156965	0.046516	-3.374424	0.0433
DLOG(MPR(-1))	-1.100777	0.411115	-2.677537	0.0752
DLOG(UMP(-1))	0.200643	0.068541	2.927357	0.0611
LOG(PVL(-1))	0.038846	0.157628	0.246440	0.8212
ECM(-1)	1.670354	0.557255	2.997469	0.0578
DLOG(ILL(-1))	0.520487	0.284719	1.828075	0.1650
ECM(-2)	-1.887201	0.800629	-2.357147	0.0997
DLOG(TAR(-2))	-1.193235	0.496285	-2.404333	0.0955
R-squared	0.994860	Mean dependent var		13.76242
Adjusted R-squared	0.967445	S.D. dependent var		0.265855
S.E. of regression	0.047968	Akaike info criterion		-3.433676
Sum squared resid	0.006903	Schwarz criterion		-2.587304
Log likelihood	51.33676	Hannan-Quinn criter.		-3.268456
F-statistic	36.28930	Durbin-Watson stat		2.348385
Prob(F-statistic)	0.006422			

Source: Own Computations using E-view 7.0

Table-7. Parsimonious Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10.55581	0.788202	13.39225	0.0000
LOG(UMP)	0.084241	0.017646	4.773942	0.0014
LOG(ILL)	-0.453687	0.178420	-2.542809	0.0346
DLOG(TAR(-1))	-3.060628	0.319266	-9.586456	0.0000
LOG(URB(-1))	4.622329	0.313700	14.73486	0.0000
LOG(CRM(-1))	-0.155721	0.021029	-7.405024	0.0001
DLOG(MPR(-1))	-1.228129	0.146329	-8.392947	0.0000
DLOG(UMP(-1))	0.210969	0.031726	6.649644	0.0002
ECM(-1)	1.716480	0.247575	6.933171	0.0001
ECM(-2)	-2.285549	0.326664	-6.996646	0.0001
DLOG(TAR(-2))	-1.137318	0.163300	-6.964594	0.0001
DLOG(ILL(-1))	0.681170	0.145508	4.681308	0.0016
R-squared	0.992317	Mean dependent var		13.76242
Adjusted R-squared	0.981753	S.D. dependent var		0.265855
S.E. of regression	0.035912	Akaike info criterion		-3.531770

Continue

Sum squared resid	0.010317	Schwarz criterion	-2.934331
Log likelihood	47.31770	Hannan-Quinn criter.	-3.415144
F-statistic	93.93288	Durbin-Watson stat	1.786203
Prob(F-statistic)	0.000000		

Source: Researchers' computation, 2013, adapted from regression result using E-view 7.0

Table-8. Variance Inflation Factors

	Coefficient	**Uncentered**	**Centered**
Variable	Variance	VIF	VIF
C	0.621263	9634.333	NA
LOG(UMP)	0.000311	18.90028	3.076095
LOG(ILL)	0.031834	7315.360	3.272630
DLOG(TAR(-1))	0.101931	18.75643	17.45092
LOG(URB(-1))	0.098408	2316.420	8.473092
LOG(CRM(-1))	0.000442	197.0850	6.326360
DLOG(MPR(-1))	0.021412	4.246299	3.986672
DLOG(UMP(-1))	0.001007	3.839127	3.707170
ECM(-1)	0.061293	4.165472	4.150121
ECM(-2)	0.106709	7.399972	7.395053
DLOG(TAR(-2))	0.026667	4.907016	4.565470
DLOG(ILL(-1))	0.021173	2.379201	2.345330

Source: Researchers' computation, 2013, adapted from regression result using E-view 7.0

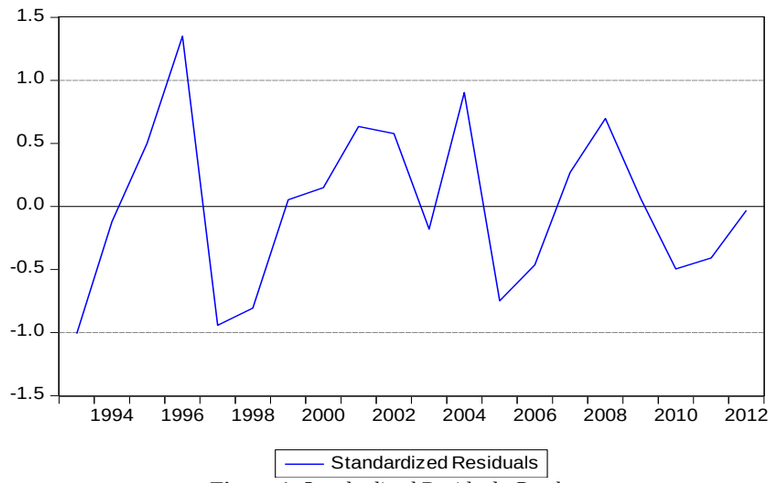


Figure-1. Standardized Residuals Graph

Source: Computer adaptation

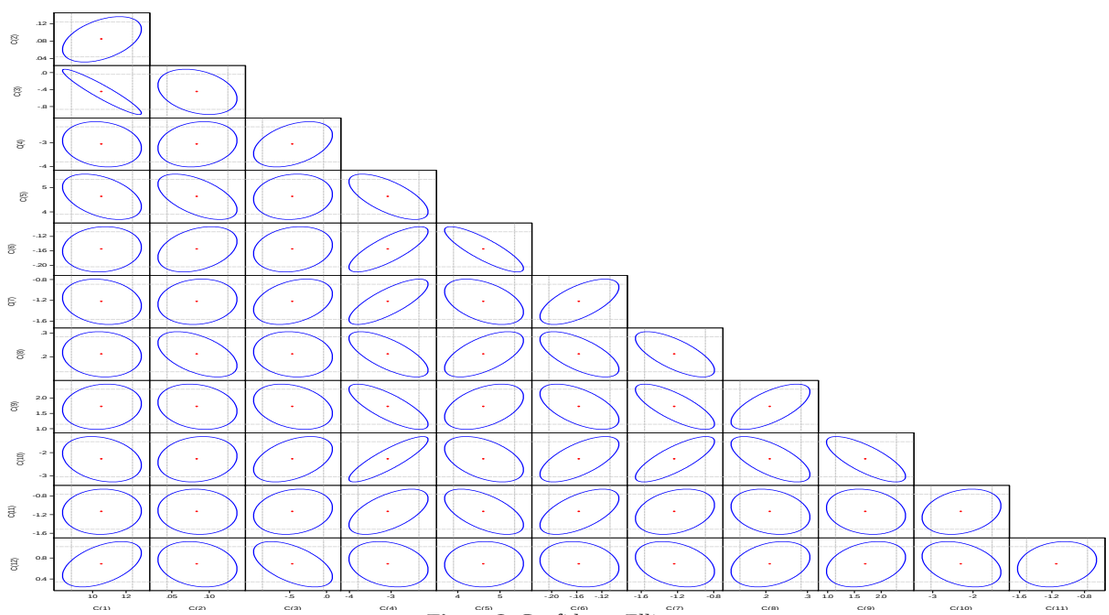
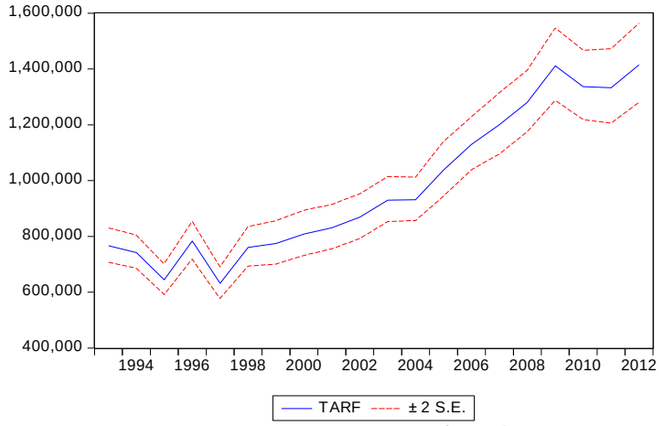


Figure-2. Confidence Ellipse

Source: Computer adaptation



Forecast: TARF	
Actual: TAR	
Forecast sample: 1990 2012	
Adjusted sample: 1993 2012	
Included observations: 20	
Root Mean Squared Error	20312.51
Mean Absolute Error	17083.63
Mean Abs. Percent Error	1.866446
Theil Inequality Coefficient	0.010017
Bias Proportion	0.000028
Variance Proportion	0.000556
Covariance Proportion	0.999415

Figure-3. Forecast

Source: Computer adaptation