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A bound testing analysis of tourism demand in Nigeria.

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A Bound Testing Analysis of Tourism Demand in Nigeria

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This study empirically examines aggregate tourism demand function for Nigeria using the time series data for the period 1995:Q1-2006:Q4. The total tourist arrivals into Nigeria are related to world income, relative prices and transportation cost. Bounds testing cointegration procedure proposed by Pesaran et al. (2001) is employed to compute the short and long-run elasticities of income, price, political stability and transportation cost variables and the CUSUM and CUSUMSQ is implemented for stability tests on the aggregate tourism demand function. The empirical results indicate that income, transportation cost, political stability and relative prices are the variables explaining the total tourist arrivals to Nigeria and a stable tourism demand function exists.

Keywords: *Tourism, UECM, Bounds Testing, ARDL, Nigeria.*

JEL Classification: *L89, C32*

I. Introduction

Tourism is a sector that involves a multiplicity of economic activities responding to differentiated demands with specific characteristics at the national and international levels. The complexity and interaction of the tourism activities justify its consideration as a special sector that integrates a set of economic activities related mainly to travelling and accommodation services. The combination of demand (travel decision) and supply

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(accommodation provision) characteristics at the national and international levels creates some difficulties in modelling the tourism activity as a whole (Proença and Soukiazis, 2005).

Thus, tourism is one of the main economic activities globally. In 2006, receipts attributed to tourism were of about US$733 billion (or US$2 billion a day) and the number of tourist arrivals was about 846 million (about 6.5% growth a year between 1950 and 2006) (WTO, 2008). This importance will tend to be reinforced in years to come; the forecasts of the World Tourism Organisation (WTO) point to about 1.6 billion international tourist arrivals worldwide by 2020. The two obvious economic benefits that tourism brings are the generation of foreign exchange and employment. Therefore, it is no surprise that tourism is an important economic activity in many parts of the world, with Nigeria inclusive. Nigeria offers a wide variety of tourist attractions such as extended and roomy river and ocean beaches ideal for swimming and other water sports, a good tropical weather, historical relics, unique wildlife, vast tracts of unspoiled nature ranging from tropical forest, magnificent waterfalls, some new rapidly growing cities and climatic conditions in some parts particularly conducive for holidays. Other attractions include traditional ways of life preserved in local customs; rich and varied handicrafts and other colourful products depicting or illustrative of native arts and lifestyle, and the authentic unsophisticated but friendly attitude of Nigerians. Consequently, the natural endowment of the weather, vegetation and climate renders Nigeria a tourism destination of variety and contact (Bankole, 2002).

Apart from generating foreign exchange, the Nigerian tourism as an export commodity for consumption by foreigners also has the potential of diversifying the country's economic base from crude oil. The economic benefits of the tourism sector also extend to its cultural and educational values.[1] However, many of these attractions are still largely untapped and even at their raw states; they are still being enjoyed by few outsiders, either very rich visitors in quest of exoticism or adventurous people in search of new challenges and experiences.

The quest for more accurate estimates of key tourism parameters such as short - and long-run price and income elasticities derives from three factors. First is their critical importance in the projection of future tourism demand in particular, and tourism market trends, in general. Tourism demand is the foundation on which all tourism-related business decisions ultimately rest. Companies such as airlines, tour operators, hotels, cruise ship lines, and recreation facility providers are interested in the demand for their products by tourists. The success of many businesses depends largely or totally on the state of tourism demand, and ultimate management failure is quite often due to the failure to meet market demand. Because of the key role of demand as a determinant of business profitability, estimates of expected future demand

[1] The Manila Declaration of the World Tourism Organization (WTO) in 1980 emphasizes intangible benefits, such as the improved quality of life and other sociological and psychological values.

constitute a very important element in all planning activities. It is clear that accurate forecasts of tourism demand are essential for efficient planning by tourism-related businesses, particularly given the perishable nature of the tourism product. Second, an understanding of tourism demand dynamics through improved and more robust estimates of tourism demand parameters is essential for more informed and successful tourism policy decision making and implementation.

Notwithstanding the economic benefits offered by the tourism industry, the Nigerian tourism industry remains underdeveloped and represents a small share of national output and world tourism. For example, with respect to the total tourists arrivals to Nigeria, the receipts generated by the number of foreign visitors have been on the decline in the last few years. In 2000, Nigeria attracted 656,000 foreign tourists, which generated an income of $186 million but fell to $49 million in 2004 even with 962,000 visitors. In addition, the tourism receipts in 2004 represented about 0.08% of the GDP and a decline of about 15% of the value recorded for 2003 (WTO, 2008). Understanding the factors responsible for the low tourism demand in Nigeria, is therefore, the pre-occupation of this study.

Quantitative studies on the demand for tourism in Nigeria are scarce. In order to fill this gap, this study employs a recent cointegration technique to explore the major factors that influence international tourist arrivals to Nigeria and to reveal the importance of a stable tourism demand equation for economic policy

evaluations. The sequence of this study is as follows: Section II discusses the review of the literature and theoretical considerations while the methodology and model specification is discussed in Section III. Section IV discusses the empirical analysis while Section V concludes.

II. Review of Literature and Theoretical Considerations[2]

The demand variable measured by total tourist arrivals is still the most frequently used measure of tourism demand, followed by tourist expenditure. Li (2004) in a survey revealed that among the 45 selected studies published after 1990, 37 of them used tourist arrivals as the dependent variable while only six of the studies employed tourist expenditure as the dependent variable. Some other studies (Turner, et al 1995; Morley, 1998; Turner and Witt, 2001) have also paid more attention to disaggregated tourism markets according to travel purpose or modes of transportation (Witt and Witt, 1992). In the areas of segmenting the tourism market, holiday and travel has attracted the most research attention in the literature (Johnson and Ashworth, 1990; Song et al, 2000 and 2003; Kulendran and Witt, 2003). This is followed by business travel studies (for example, Kulendran and Witt, 2003). Nevertheless, some other studies have also focused on international conferences (Witt *et al* 1992, 1995) and the demand for Ski tourism (Riddington, 1999, 2002).

On the choice of explanatory variables, Lim (1997) argued that discretionary income, defined as the remaining incomes after spending on necessities in the

[2] This section benefits from the work of Song and Turner (2006).

country of origin, should be used as the appropriate measure of tourist income in the demand model. However, this variable can be categorized as being subjective as the data may not be available in practice. Therefore, alternative measures of income have to be employed as a proxy for tourist discretionary income. Among these alternatives, real personal disposable income (PDI) is the best proxy to be included in a demand model related to holiday or visiting friends and relatives (VFR) travel (Syriopoulos 1995; Song et al., 2000; Kulendran and Witt, 2001). Other alternatives include constant prices of National Disposable Income (NDI), Gross Domestic Product (GDP) and Gross National Income (GNI). Some other possible proxies include real private consumption expenditure and the industry production index (Song et al., 2003 and Gonzalez and Moral, 1995).

Despite the fact that most studies have found that income is the most important factor influencing the demand for tourism, this finding has been inconclusive. By way of illustration, the income variable was found to be insignificant in some of the error correction models in Kulendran and King (1977), Kim and Song (1998) as well as Song, et al, (2003) and specifically an insignificant income variable tends to be associated with models that relate to demand for international tourism by residents from Japan and Germany. One possible reason cited by Song and Turner (2006) is that there are measurement errors in the data, and this is particularly true for the German income data as a result of unification.

On the issue of income elasticity, Li (2004) looked at published studies on the demand for international tourism by UK residents between 1990 and 2003. Findings from his study revealed that 54 of the 80 estimated income elasticities were greater than one, 24 of the studies were between zero and one while only in two cases were the income elasticities less than zero. These two cases were, however, related to the European destinations. A suggestion from this finding is that international tourism can be regarded as being a luxury product, while long-haul travel is more income elastic than short-haul travel. On the magnitudes of long-run and short-run income elasticities, Syriopoulos (1995), Kim and Song (1998), Song and Witt (2000), and Song, et al; (2003) show that the values of the long-run income elasticities tend to be higher than short-run counterparts, suggesting that it takes time for income changes to effect on the demand for tourism due to information asymmetry and relatively inflexible budget allocations (Syriopoulos, 1995; Song and Turner, 2006).

The price of tourism is another important variable in the international tourism-demand literature. With respect to theory, this variable should contain two components: costs of living in the destination and travel costs to the destination. However, due to unavailability of data travel costs have been omitted in most tourism demand-related studies except for studies such as Witt and Witt (1991, 1992), Lim and McAleer, (2001, 2002), and Dritsakis (2004). The cost of living in the destination is normally measured by the destination consumer price index (CPI). Another important factor that may also contribute to the cost of living in the destination is the exchange rate between the origin

country and the destination country, as a higher exchange rate in favour of the origin country's currency could result in more tourists visiting the destination from the origin country. Witt and Witt (1992) and Qui and Zhang (1995) used CPI in the destination and the exchange rates between the destination and the origin separately to account for the costs of tourism, while the majority of the recent studies have commonly employed an exchange rate adjusted relative price index between the destination and origin as the own price variable (Turner and Witt 2003).

With respect to the own-price elasticity, Li (2004) found that 68 out of 78 estimates show negative values ranging from zero to minus one, in line with the theoretical assumption. Smaller values of own-price elasticity compared with income elasticity suggest that the sensitivity of tourist responses to tourism price changes, is much lower than to income changes, indicating that international tourism tends to be price inelastic. In addition, substitute prices in alternative destinations have also been shown to be important determinants. There are two forms of substitute prices: one allows for the substitution between the destination and separately, a number of competing destinations (Kim and Song 1998; Song, et al., 2000) and the other calculates the cost of tourism in the relevant destination relative to a weighted average cost of living in various competing destinations; and this index is also adjusted by relevant exchange rates. The weight is the relative market share (arrivals and expenditures) in each competing destination (Song and Witt, 2003). The alternative form often used in empirical studies, as fewer variables is

incorporated into the model, hence more degrees of freedom are available for the model estimation.

Another important variable in the tourism demand model is marketing. The inclusion of this variable in the demand model with disaggregated data is expected to generate significant results. However, in aggregated studies the unavailability of marketing expenditure data across different origin countries has constrained its inclusion in the demand models. Only three studies incorporate this variable in their demand analyses (Witt and Martin, 1987, Crouch, et al; 1992). In the studies by Kulendran and King (1997), Song, et al; (2000, 2003) and Lim and McAleer (2001, 2002) the lagged dependent variables have been found to be important factors that influence the demand for tourism, and their significance suggest that consumer persistency and word of mouth effects should be properly considered in demand forecasting models. The exclusion of this variable in the modeling process can result in biased forecasts.

In the process of accounting for the impact of one-off events and tourism taste changes on the demand for tourism, dummy and time trend variables have been used in some studies. As far as one-off events are concerned, the impacts of the two-oil crises in the 1970s are examined in some empirical studies, followed by the Gulf War in the early 1990s and the global economic recession in the mid-1980s. Other regional events and origin/destination specific effects have

also been included in some studies. As for the trend variable, the deterministic linear trend has been used especially in studies prior to the 1990s.

The theoretical framework of tourism demand is laid on the foundation of the consumer theory which predicts that the level of consumption depends on the consumer's income, the price of the good/service in question, the prices of related goods (substitutes and complements), and other factors that shifts demand. Economic analysis has recognized the role of key variables in determining demand and consumption. In practice, empirical models of tourism demand borrow heavily from consumer theory which predicts that the optimal consumption level depends on the consumer's income, the price of the good in question, the prices of related goods (substitutes and complements), and other demand shifters. Formally, the Marshallian demand for tourism product can be expressed as,

$$TA = f(WY, RP, TC, POL) \quad (1)$$

where TA is the total number of tourists arrivals; WY is world income; RP is relative prices; TC is transportation cost index and POL is political stability.

III Methodology and Model Specification

Empirical Specification of the Model

Most of the studies modelling the demand for tourism have used visitor arrivals or tourism earnings as a dependent variable (Narayan, 2002; Halicioglu, 2004;

Katafono and Gounder, 2004) or foreign tourist overnight stays (Mervar and Payne, 2007). For the purposes of this study, visitor arrivals will be used as the dependent variable. This is to make our study comparable to past studies. However, with respect to the determinants of international tourism demand, there is no clear-cut approach to the type of variables which could be used as independent variables. For example, the survey of 100 empirical articles by Lim (1997) on international tourism demand reveals that the most widely used explanatory variables are income, relative prices and transportation costs. Thus, while fluctuations in international tourism demand may be influenced by many factors, most studies have focused on the economic factors in estimating a satisfactory explanation.

With respect to the choice of income in this framework, the argument is that as people's income increases, the more inclined they are to travel. Crouch (1994) reveals that the income is the most important explanatory variable. However, income elasticity estimates vary a great deal, but generally exceed unity and below 2.0, confirming that international travel is a luxury good (Halicioglu, 2004).

The choice of price in modeling tourism demand is, however, vexatious. The importance of including variables that represent tourism prices is a fundamental challenge to modeling tourism demand. This is because the price of tourism must reflect transportation costs (airfares), or cost of living (accommodation, meals, etc.) at the destination country. In addition, some trips

involve multiple destinations. The origin of the problem is due to the fact that indices for tourism prices are not generally available. Rather, in the absence of such an index, researchers have used exchange rate variables to proxy for tourism prices. The assumption is that the prices of hotels and restaurants move in line with domestic prices. Therefore, if the domestic exchange rate was not maintained at a competitive level, potential tourists would be dissuaded to travel to such destinations.

In addition, a tourism demand must reflect the price of transportation. However, due to the complex nature of the cost of transportation, no consistent data exists on transportation prices. Rather, empirical investigation in the literature have made use of the distance of travel, price of airline tickets, or crude oil prices as a suitable proxy for transportation costs. Crouch (1994) argues that, from the wide variety of results, one cannot adequately reveal that the underlying nature of the relationships between the demand for international tourism and its determinant (Halicioglu, 2004).

Finally, one-off shocks could also impact the demand for tourism. In the case of Nigeria, political crises can be a major deterrent for tourists. Hence, a dummy variable is used to account for years of political instability in Nigeria. The aggregate tourism demand model for Nigeria assumes that total tourists flow into Nigeria is determined by the level of world income, the relative prices, transportation cost as well as political instability. Thus our empirical model can be presented as:

$$LnTA = \alpha_0 + \alpha_1 LnWY + \alpha_2 LnRP + \alpha_3 LnTC + \alpha_4 POL + \mu_t \quad (2)$$

where TA is the total number of tourists arrivals into Nigeria; WY is world income in constant 2000 US dollars; Gross domestic product of all countries excluding Nigeria is summed up to derive this proxy income variable; RP is relative prices proxied by the real effective exchange rate; TC is transportation cost index. It is based on the per barrel spot oil prices with 2000=100. POL is political stability and takes the value of one in the years of the instability(s) and zero otherwise. The error term is represented by μ_t. A-priori we expect $\alpha_1 > 0, \alpha_2 < 0, \alpha_3 < 0, \alpha_4 < 0$.

Estimation Technique

Pesaran *et al.* (2001) developed a new Auto-Regressive Distributed Lag (ARDL) bounds testing approach for testing the existence of a cointegration relationship. The bounds testing approach has certain econometric advantages in comparison to other cointegration procedures (Engle and Granger, 1987; Johansen, 1988; Johansen and Juselius, 1990). First, endogeneity problems and inability to test hypotheses on the estimated coefficients in the long-run associated with the Engle-Granger (1987) method are avoided. Second, the long and short-run parameters of the model in question are estimated simultaneously. Third, the econometric methodology is relieved of the burden of establishing the order of integration amongst the variables and of pre-testing

for unit roots. The ARDL approach to testing for the existence of a long-run relationship between the variables in levels is applicable irrespective of whether the underlying regressors are purely $I(0)$, purely $I(1)$, or fractionally integrated. Finally, as argued in Narayan (2005), the small sample properties of the bounds testing approach are far superior to that of multivariate cointegration (Halicioglu, 2007). The approach, therefore, modifies the Auto-Regressive Distributed Lag (ARDL) framework while overcoming the inadequacies associated with the presence of a mixture of $I(0)$ and $I(1)$ regressors in a Johansen-type framework.

The ARDL representation of equation (2) is, therefore, formulated as follows:

$$\Delta LnTA = \alpha_0 + \sum_{i=1}^{q} \alpha_{1i} \Delta LnTA_{t-i} + \sum_{i=0}^{q} \alpha_{2i} \Delta LnWY_{t-i} + \sum_{i=0}^{q} \alpha_{3i} \Delta LnRP_{t-i}$$

$$+ \sum_{i=0}^{q} \alpha_{4i} \Delta LnTC_{t-i} + \alpha_{5i} LnTA_{t-1} + \alpha_{6i} LnWY_{t-1} + \alpha_{7i} LnRP_{t-1} + \alpha_{8i} LnTC_{t-1} + \alpha_9 POL \quad (3)$$

where $LnTA$ is the log of tourists arrivals; $LnWY$ is log of real world income; $LnRP$ is log of relative prices, LnTC is log of transportation index, POL is political stability, q represents the lag length and $\sum$ is the summation sign. Investigation of the presence of a long-run relationship amongst the variables of Eq. (2) is tested by means of bounds testing procedure of Pesaran et al (2001). The bounds test is a Wald Test (or F-test) in which the joint significance of coefficients for lagged level variables is tested with F-statistics calculated under the null. The distribution of the test statistics under the null is non-standard, in which critical values depend on the order of integration of variables involved. More formally, we perform a joint significance test, where

the null hypothesis ($H_0 : \alpha_5 = \alpha_6 = \alpha_7 = \alpha_8 = 0$) is tested against the alternative hypothesis that ($H_A : \alpha_5 \neq 0, \alpha_6 \neq 0, \alpha_7 \neq 0, \alpha_8 \neq 0$).

Utilizing Monte Carlo simulation experiments, Pesaran et al. (2001) tabulated asymptotic critical values, depending on whether or not drift and/or time trend terms are included as well as the number of independent variables. Given the number of independent variables, if all variables are I(0), the critical value approaches a minimum and, if they are all I(1), the corresponding critical value becomes a maximum. In the case of a mixture of integrating orders among variables, the critical value falls between a minimum and a maximum. Therefore, if the calculated F-statistics under the null is located outside the maximum, the null hypothesis of no cointegration is rejected, while if it is located inside the minimum, the null is not rejected. Finally, if the test statistics falls between them, one cannot draw a conclusive decision. In this case, further investigation based on more information about orders of integration is required to reach a conclusion.

Bahmani-Oskooee and Brooks (1999), however, argued that the existence of a cointegration derived from equation (3) does not necessarily imply that the estimated coefficients are stable. Consequently, cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) stability tests based on the recursive regression residuals are carried out. The two tests incorporate the short-run dynamics to the long-run through residuals. The statistics of the two tests are updated recursively and plotted against the break points of the model.

Providing that the plot of these statistics fall inside the critical bounds of 5% significance, one assumes that the coefficients of a given regression are stable. The outputs of the two tests are usually presented in graphical form.

Sources of Data

Quarterly time series data were collected on tourists arrivals, world income, real effective exchange, political instability and per barrel spot oil prices. The quarterly data covers the period 1995:Q1 to 2006:Q4. The choice of this period was guided by data availability considerations. The data were obtained from the Central Bank of Nigeria Statistical Bulletin (2005), Annual Report and Statement of Accounts (2006), and World Bank World Development Indicators (WDI), 2008 edition.

IV. Empirical Analysis

IV.1 Lag Length Selection

In order to select the lag length for the cointegration test, we employed both the Akaike Information Criterion (AIC) and the Scharwz's Bayesian Information Criterion (SBC). The results of the lag selection tests in addition with the diagnostic tests on the residuals are presented in Table 1. The testing methodology adopts the approach suggested in Pesaran, et al. (2001, Table 1). The analysis presents the results of the lag selection with and without a deterministic trend. A valid bounds test requires that the error terms should not be serially correlated (Pesaran, et al., 2001). The results of the lag selection criteria in Table 1 suggest that the optimal number of lags is 2. For lags 3 and 4

the errors are serially correlated. Consequently, the lag length we made use of in this study is 2.

Table 1: Lag Length Selection for the Cointegration Test

	With deterministic trend				Without deterministic trend			
	AIC	SBC	χ^2 sc(1)	χ^2 sc(3)	AIC	SBC	χ^2 sc(1)	χ^2 sc(3)
1	63.0	51.0	0.9	5.3	54.4	50.2	0.05	2.3
2	63.0	50.1	0.3	4.8	57.4	51.5	0.3	0.6
3	66.4	52.6	7.8***	16.4***	61.7	53.7	5.5**	16.3***
4	72.1	56.6	8.4**	20.1***	66.5	56.4	7.9***	19.2***

Notes: p is the lag length, AICp=LL_p- s_p and SBC=LLp (s_p/2)lnT denote Akaike's and Scharwz's Bayesian Information Criteria for a given lag order p, where LL_p is the maximized log-likelihood value of the model, s_p is the number of freely estimated coefficients and T is the sample size. χ^2 sc(1) and χ^2 sc(3) are the LM statistics for testing no residual serial correlation against orders 1 and 3. The symbols ** and *** denote significance at 5% and 1% levels, respectively.

The bounds test results are reported in Table 2. The computed F-Statistics of 4.3719 was found to exceed the upper bounds critical value of 3.52 for a significance level of 10% and the upper bounds critical value of 4.01 for a significance level of 5%. This implies that tourist arrival and its determinants, income, relative prices, transport cost and political stability are cointegrated or co-moving.

Table 2: Bounds Testing for Cointegration Analysis

Panel A

	Unrestricted intercept and no trend
	F-test Statistic
F_{TA}(TA/WY, RP, TC, POL)	4.3719**

Panel B

1%		5%		10%	
I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
3.74	5.06	2.86	4.01	2.45	3.52

Notes: *** Statistical significance at 1% level; ** Statistical significance at 5% level; * Statistical significance at 10% level. The lag length k=2 was selected based on the Schwarz criterion (SC). Critical values are obtained from Pesaran, *et al.* (2001), p. T.2, Table Cl. iii: Case III.. The number of regressors is 4.

Long-Run and Short-Run Coefficients

The long-run coefficients are presented in Table 3 and we found evidence to support the literature that real world income level, relative prices, transportation cost and political stability have a role to play in the demand for tourism in Nigeria. Specifically, a 1% increase in world income can stimulate the demand for tourism in Nigeria growth by 2.69% in the long run while a 1% increase in relative prices can deter tourism by 1.35% in the long run. In addition, there is a negative and significant relationship between tourism demand and transport cost in the long run. Per barrel spot prices of crude oil as a proxy of transportation cost was found to be negative and significant at the 10% significance level. In addition, we found a significant long run relationship between tourism demand and political stability in Nigeria. The

import of this finding is that in the long run, tourism demand is income and price elastic but transport cost inelastic.

Table 3: Estimated Long Run Coefficients using the ARDL Approach. ARDL (1, 1, 0, 0, 0) selected based on Schwarz Bayesian Criterion

Explanatory Variables	Dependent Variable is LY
Constant	-2.6584 (-1.3692)
WY	2.6942* (1.6719)
RP	-1.3539* (1.6692)
TC	-0.3858* (1.7067)
POL	0.2356* (1.2369)

Notes: *** Statistical significance at 1% level; ** Statistical significance at 5% level; * Statistical significance at 10% level; Figures in parenthesis are t-ratios.

In order to see the short-run dynamics, the estimates of the error correction model are presented in Table 4 and the results of the long-run estimates are supported. Consistent with previous studies on tourism demand, real world income is positively related to the demand for tourism. As income increases, demand for tourism also increases, with the elasticity greater than one. In the short-run, a 1 percent increase in our major trading partners' GDP raises tourism demand (visitor arrivals) by around 1.31 percent.

Consistent with the a-priori expectation, relative prices variable is negatively related to tourism demand. This means that an increase in relative prices will lead to a decline in the demand for tourism. A possible explanation could be that increases in short-term and long-term prices can deter tourists, whether

they are small budget or high-budget tourists. Transport cost was also found to be inversely related to the number of tourists' arrival in Nigeria. As transportation cost increases, demand for tourism decreases, with the elasticity less than one. A 1% increase in transportation cost reduces tourism demand by 0.06%. Contrary to the a-priori expectation, political instability was not found to be a major deterrent to the demand for tourism. Rather it was found to have a positive impact on tourists arrivals in Nigeria. The advent of democracy in Nigeria since 1999, when a democratically-elected government was sworn in, might be the plausible reason for the result on the political instability variable or the possibility that the political instability of the late 1990s is overwhelmed by the relative peace enjoyed since the transition to democratic governance which begun in 1998.

The error correction term (ECM(-1)) is negative and statistically significant, thus corroborating the results of the cointegration tests of the existence of a stable long-run relationship among the variables. The error correction term is -0.55 which indicates that 55% of the previous year's deviation from long-run equilibrium will be restored within one quarter.

Table 4: Error Correction Representation for the Selected ARDL Model

ARDL (1,1, 0,0,0) selected based on Schwarz Bayesian Criterion

Explanatory Variables	Dependent Variable is LY
ΔWY	1.3158* (1.6968)
ΔRP	-0.2105*** (2.5786)
ΔTC	-0.0600*** (2.2872)
POL	0.03664*** (1.6469)
ΔC	-4.1344** (-1.5611)
ECM(-1)	-0.5555** (-1.8027)
Diagnostic Statistics	
R-Square	0.7331
Adjusted R-Square	0.6204
$\chi^2_{Auto}(1)$	0.1743
$\chi^2_{Norm}(2)$	0.6023
$\chi^2_{Hetero}(1)$	3.0859
$\chi^2_{RESET}(1)$	0.2180

Notes: 1.*indicates that a coefficient is significant at the 1 percent level; **indicates that a coefficient is significant at the 5 percent level; ***indicates that a coefficient is significant at the 10 percent level. 2. Figures in parenthesis ( ) are t-ratios.

Furthermore, Table 4 presents diagnostic tests of our model and suggests the absence of any major diagnostic problems such as serial correlation, non-normality and specification errors. These results indicate that our estimated tourism demand model is well-specified. Thereafter, it is necessary to check for the stability of the tourism demand function given the importance of the stability of the tourism demand function for an effective tourism management policy. We test whether the estimated tourism demand equation has shifted

over time. As can be observed from Figures 1 and 2, the CUSUM and CUSUM of Square tests of parameter stability indicate that the parameters were stable during the sample period.

Figure 1: CUSUM Test

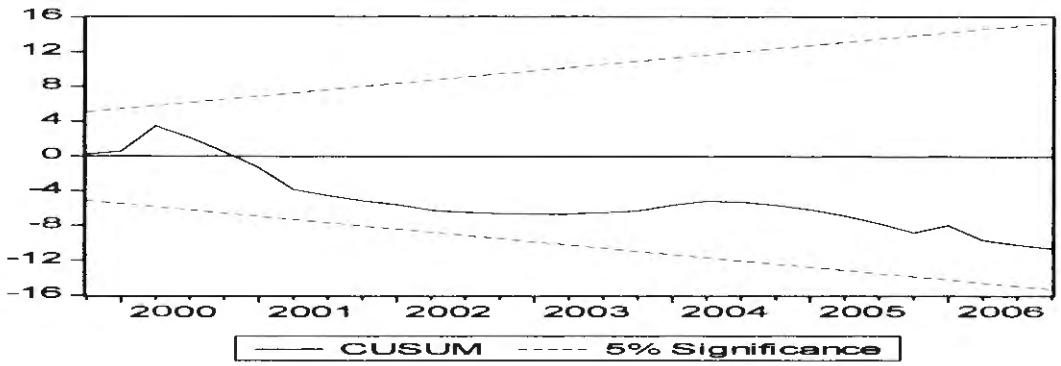
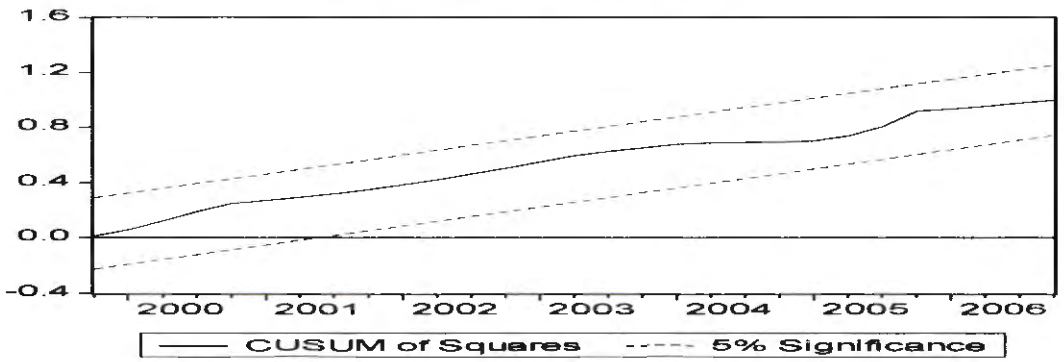


Figure 2 : CUSUM of Squares



The estimates obtained in this study compare well with other published elasticity estimates of tourism demand. For example, we found similar results with the studies of Katafono and Gounder (2004) for Fiji; Mervar and Payne

(2007) for Croatia; Sahely (2005) for Eastern Carribean Currency Union; and Halicioglu (2004) for Turkey on the determinants of tourism demand. The findings from the studies reveal that world income, relative prices, transportation costs and political stability are important determinants of tourism demand. The result from this study, therefore, confirms the outcome of other studies on tourism demand.

V. Conclusion

This study estimated an aggregate tourism demand function for Nigeria using a recent single equation cointegration technique, ARDL – Bounds testing approach developed by Pesaran, et al; (2001). The regression results suggest that the most significant factor in determining the level of tourists arrivals into Nigeria is real world income level, followed by the relative prices and transportation cost; evident from the short-run and long-run estimates. In addition, political stability was found to have a positive effect on tourism demand in Nigeria during the study period. The estimated income, price and transportation cost elasticities are in consonance with previous empirical studies in the tourism economics literature. Furthermore, using CUSUM and CUSUMSQ stability tests, the estimated tourism demand function reveals a stable long-run relationship between its dependent and independent variables. With respect to the Nigerian tourism policy, the stability of a tourism demand function will reduce the uncertainty associated with the world economic environment and will likely increase the credibility of the government's commitment to pursue a sustainable tourism policy.

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