

A PANEL DATA ANALYSIS OF DEMAND FOR TOURISM IN AFRICA

BY

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1. INTRODUCTION

Tourism is one of the most flourishing and emerging industry in the world with the international receipt growing by over 10 percent over the last ten years, while international tourism expenditure amounted to over US\$525billion in 2003 (WTO, 2004). Despite its potential of creating many employment opportunities and foreign exchange in any economy, it is also a means of enhancing each country destination's infrastructural facilities as well as promoting cooperation and understanding among people all over the world. Tourism has become a means by which many countries, especially the developing countries, improve their income base and at the same show case their traditional heritage.

Tourism in African continent has been seen as a means of enhancing economic growth and development (Kester, 2003) as well as launching the image of the continent to the outside world. According to Christie and Crompton (2001), the contribution of tourism industry in the gross domestic products (GDP) and exports in many African countries has been improving overtime. As identified by WTO (2004) report, there has been significant growth in the level of international tourist arrivals in Africa. The World Travel and Tourism Council (WTTC) also put the value of US\$39.6billion as the

amounted that was generated in 2003 from economic activities in the travel and tourism industry in sub-Saharan Africa. The report also shows that about 2.5% of the GDP in the region is accounted for by tourism industry that has generated about 5.5% of all employment in the region.

However, in spite of Africa's potential in tourism, the continent's tourism endowments have been underdeveloped and underutilized. WTO (2004) report indicates that Africa has attracted less than 5% of international tourist arrivals in 2004, and had received less than 3% of international tourism receipts. Africa in 2001 received about 27.7million international tourist arrivals and got an international tourism receipts of US\$11.7billion (Naude and Saayman, 2004), which implies that 3.7 arrivals per 100 of population that is compared poorly with the world average of 11 and the 44 per 100 in Europe.

Furthermore, despite African potentials in tourism industry, there are limited empirical studies on issues concerning the hypothetical subject matter in the continent. This is the reason why Christie and Crompton (2001) opined that the lack of appropriate empirical studies on tourism in Africa is what contributed to the inadequate policy guidance to the industry. It is against this background of shortage in empirical studies of tourism in Africa that we intend to contribute to the frontier of knowledge in tourism literature in Africa by including both endogenous and exogenous variables in explaining the factors that determine the demand for tourism in Africa through dynamic generalized method of moment (GMM) of panel data analysis between the period of 1995 to 2004 (an update of Naude and Saayman (2004) data points).

II. TOURISM IN AFRICA

Tourism is one of the major global economic activities. Tourism is said to be an important ingredient for economic development through its impact on employment generation, enhancement of infrastructure provision, generation of income taxes, exports and by acceleration global peace (Eilat and Einav, 2003). According to Sinclair (1998), the contribution of tourism to development is well documented and tourism is now among the fastest growing industries in the world. Competition among destinations has intensified to attract more and more tourists.

Tourism growth has been impressive in recent years and this shown in the number of tourism arrivals in all countries that increased from 25.3 million in 1950 to 69.3 million in 1960 and later to 165.8 million in 1970. Despite the drag in the growth rate of tourist arrivals since 1970, world tourist arrival multiplied by a sector of about 27 between 1950 and 2000 (see table 1). Thus, from 25.3 million in 1950, international tourist arrivals (now arrivals) reached 763.2 million in 2004, with an average annual growth rate of 6.4 percent. In terms of global tourism receipts, the world witnessed an increase in tourism receipt from US\$2.1billion in 1950 to US\$17.9billion in 1970 and later rise to US\$106.5billion in 1980. Due to more and more arrivals in the world and with their accompany expenditure, international tourism receipts move from US\$105billion in 1980 to US\$479.2 billion in twenty years after. This increasing trend continues till 2004, where the total global tourism receipts amounted to US\$622.7billion. Thus, tourism is one of the most flourishing sectors in the world given that it global receipt have grown by 12 percent over the last ten years (Durbarry, 2001). This has led to

the case where many countries are setting targets in attempts to gain the additional income, foreign currency, employment and tax revenue that the sector can provide.

It is as a result of this that many African countries have started tapping the potentialities that is embedded in tourism and hospitalities. According to Kester (2003), tourism has the potential to contribute significantly to economic growth and development in Africa. Naude and Saayman (2004) opined that Africa’s cultural and natural resource endowment are such that it ought to be benefiting largely from tourism, while Christie and Crompton (2001) believe that African has an “exceptional” tourism potentials and that the it is increasingly contributing to the continent’s gross domestic products (GDP) and exports.

Table 1: International Tourism Arrivals, 1950-2004 (million)

Year	World	Africa	America	Asia & Pacific	Europe	Middle East
1950	25.3	0.5	7.5	0.2	16.8	0.2
1960	69.3	0.8	16.7	0.9	50.4	0.6
1970	165.8	2.4	42.3	6.2	113.0	1.9
1980	278.2	7.3	62.3	23.6	117.5	7.5
1990	441.0	15.2	92.8	57.7	265.3	10.0
2000	680.6	28.2	128.2	114.9	384.1	25.2
2001	680.4	28.9	122.1	120.7	383.8	25.0
2002	700.4	29.5	116.6	131.1	394.0	29.2
2003	689.7	30.8	113.1	119.3	396.6	30.0
2004	763.2	33.2	125.8	152.5	416.4	35.4

Source: World Tourism Organisation (2005)

Table 2: International Tourism Receipt, 1950-2004 US\$ (billion)

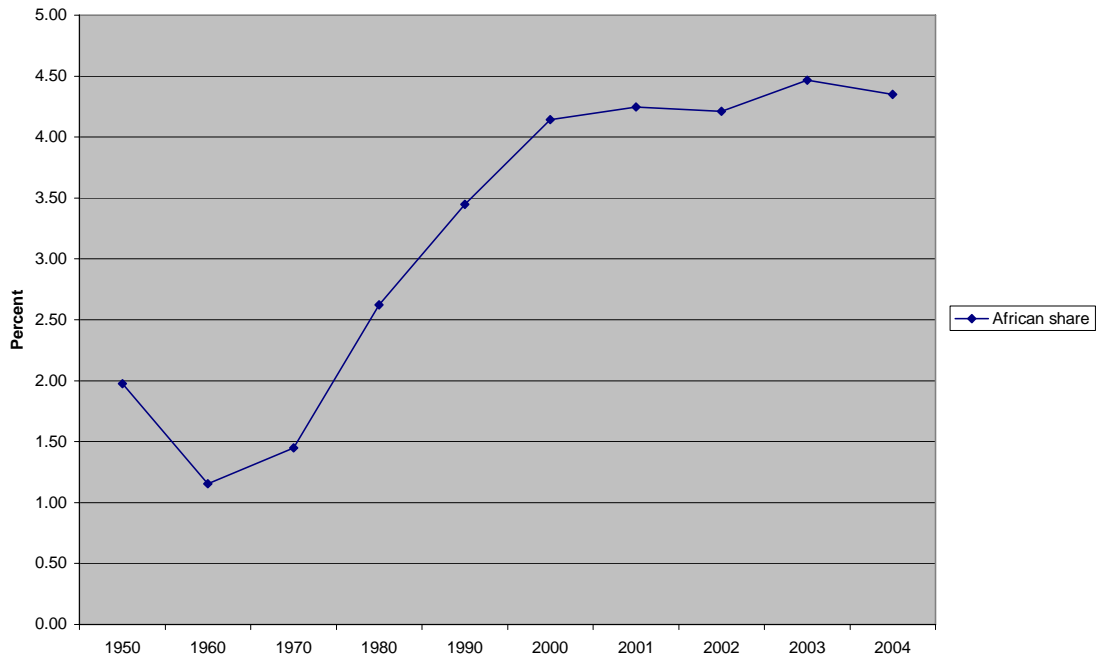
Year	World	Africa	America	Asia & Pacific	Europe	Middle East
1950	2.1	0.1	1.1	0.04	0.9	0.03
1960	6.9	0.2	2.5	0.2	3.9	0.1
1970	17.9	0.5	4.8	1.2	11.0	0.4
1980	106.5	3.4	24.7	11.3	63.7	3.5
1990	273.2	6.4	69.3	49.7	145.6	5.1
2000	479.2	10.6	131.0	90.4	231.6	15.6
2001	467.0	11.5	119.8	93.5	226.7	15.5

2002	481.6	11.8	113.7	99.1	241.2	15.7
2003	524.2	15.5	114.1	94.9	282.9	16.8
2004	622.7	18.3	131.7	125.0	326.7	21.0

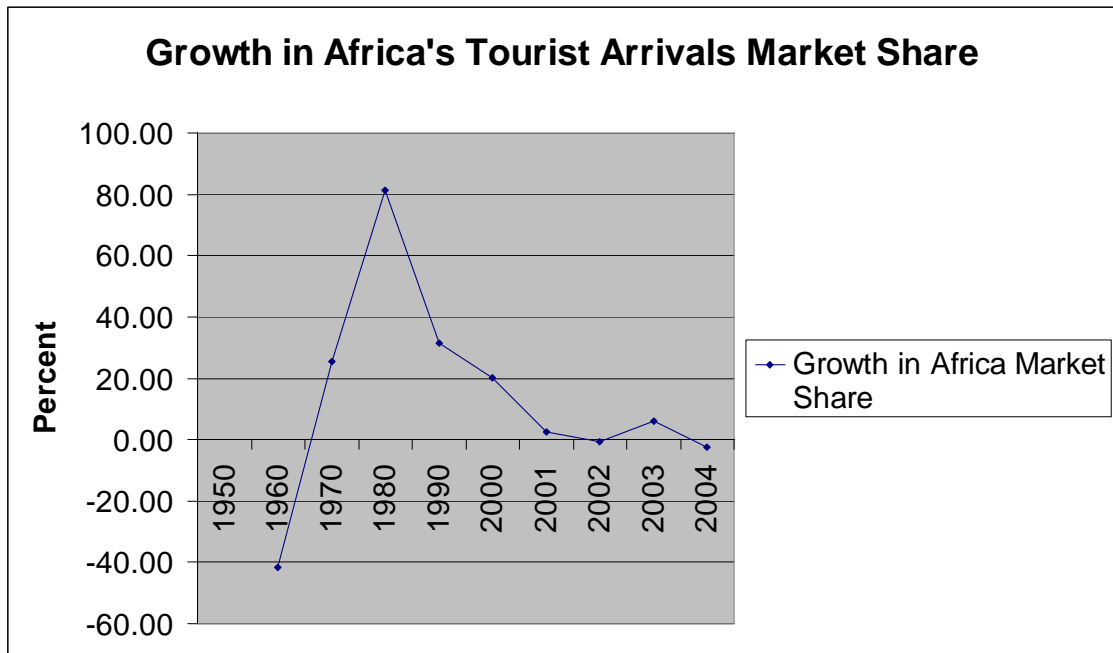
Source: World Tourism Organisation (2005)

International tourist arrivals to Africa destinations increase from just 500,000 in 1950 to over 15million in 1990 (see table 1 above). This increase in arrivals continues, as it got to 28.2million in 2000 and later rise to 33.2million in 2004. This really shows that Africa tourist arrivals have been growing overtime. According to WTO (2003) figures, Africa tourism has grown significantly since 1990. In terms of the continent receipts on global tourism, table 2 shows that African receipts on international tourism rise from US\$100million in 1950 to US\$3.4billion in 1980, which later increased to US\$6.4billion in 1990. By 2000, African tourism receipts have risen to US\$10.6billion and got to US\$18.3billion in 2004. These incremental trends in African arrivals and receipts literarily depict that Africa is performance in term of tourism, but when we look at its share in the global tourism, we could sea that through it share in international tourist arrivals increased from 1.98 percent in 1950 to 4.25 in 2001, which is about 130 percent increment. This latter fall in 2002 to 4.21percent and picked up by 2004 to 4.4 percent of the global tourist arrivals (see figure 1).. In terms of the growth rate, the continent witnessed a negative growth in 1960 of about 42 of its arrivals. This later change to a positive growth rate of about 81percent in 1980 (the peak), afterwards, there the growth rate has been increasing at a decreasing rate up to 2004 when she witnessed a negative growth rate in arrivals of 6percent (see figure 2).

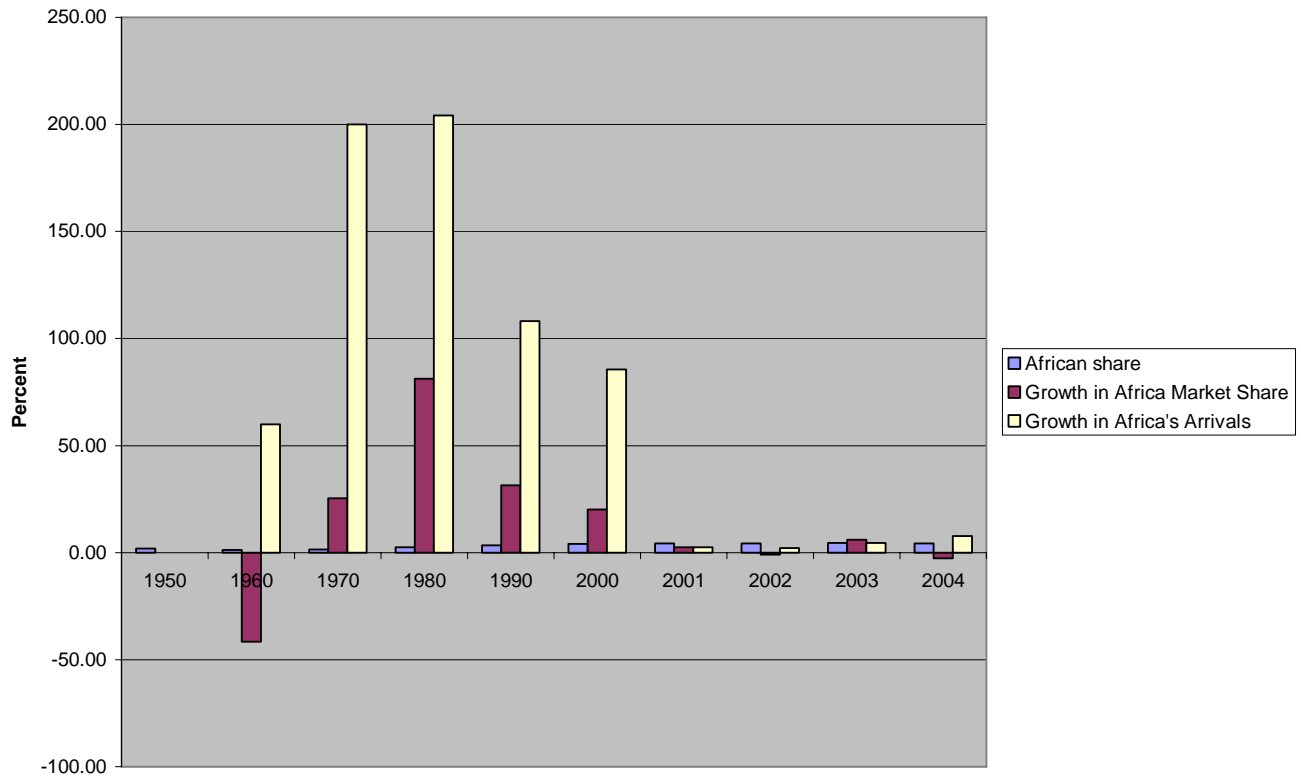
African Share in Global Tourist Arrivals



Growth in Africa's Tourist Arrivals Market Share

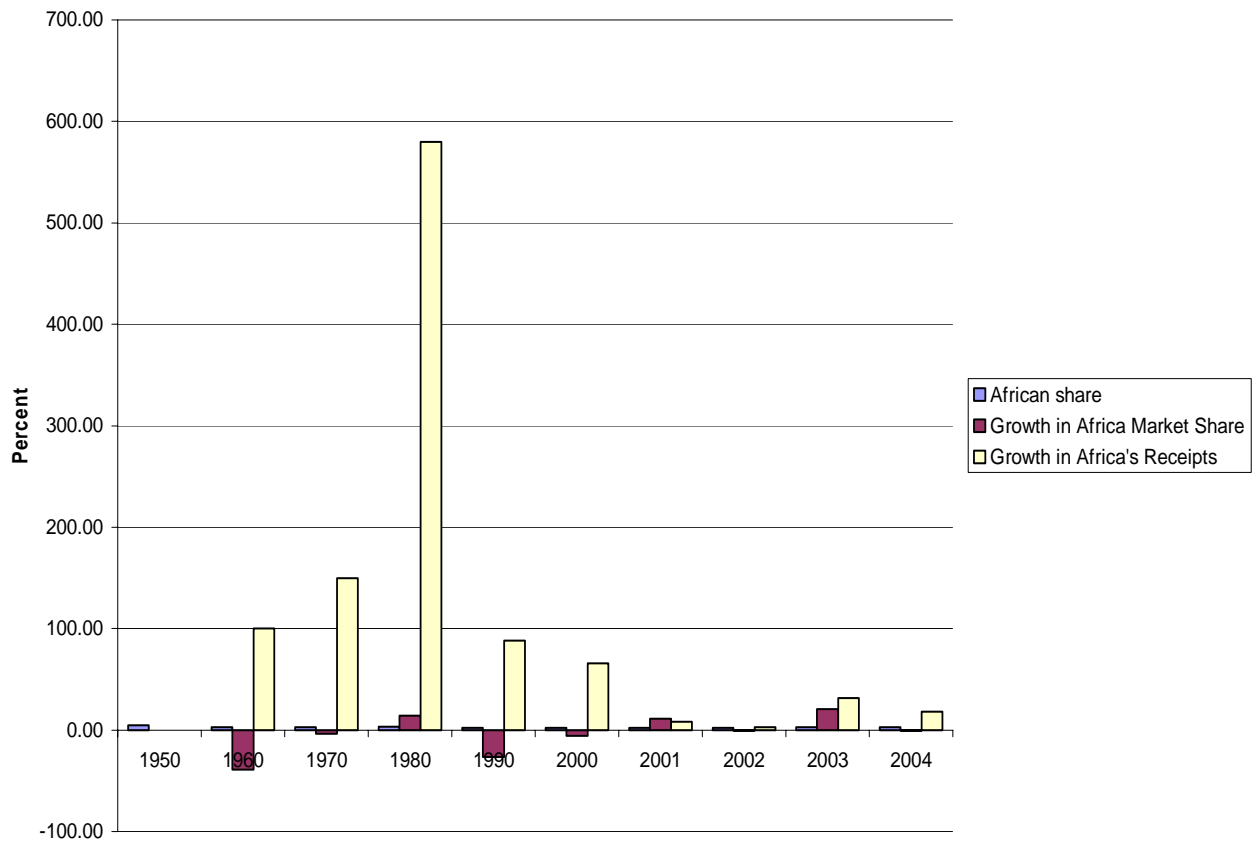


Africa's Tourist Arrivals Performance



The case of the growth rate of Africa's tourist arrivals is not that different with her receipts, as she experienced a negative growth rate of her receipt in 1960 (39percent) and by 1990, it has reduced to -27percent and later to -0.7percent in 2004 (see figure 4).

Africa's Tourism Receipts Performance



Regionally, there are different in performance of these regions in the continent. According to WTO figure (2003), there has been considerable improvement in tourism in Africa, especially in 1990, especially that of southern Africa that has grown by about 300% between 1990 and 2002 (see table 3 below). However, North Africa still remains the most attractive regional destination, capturing 1.5% of the total international tourism market share (Naude and Saayman, 2004). Worth of noticing is that as the tourist arrivals in Africa increased in 2001 that of the world tourism decreased during the period. The report of WTO (2003c) indicates that there had been increasing trend in tourism in Africa despite the SARS virus that affected the Asia counties and the war in Iraq.

Central Africa remains the least tourist arrivals destinations in the continent followed by the West African destinations. This might be due to the inadequate infrastructural facilities that are available for tourism in these destinations.

Table 3: Africa's International Tourist Arrivals by Region

	1990	1995	2000	2002	2003	2004	1995*	2004*
Africa	15,160	20,438	28,154	29,492	30,763	33,222	100	100
North Africa	8,398	7,271	10,202	10,407	11,092	12,791	35.6	38.5
West Africa	1,352	1,913	2,451	2,728	2,762	2,960	9.4	8.9
Central Africa	365	357	665	627	677	788	1.7	2.4
East Africa	2,842	4,906	6,600	6,927	7,251	7,483	24.0	22.5
South Africa	2,203	5,991	8,235	8,804	8,980	9,199	29.3	27.7

Source: World Tourism Organisation (2004)

Literature Review

In general, the tourism literatures on the modeling of tourism demand focuses either on analyzing the impact of different determinants and/or on the accurate forecasting of the future tourism demand.

This study lies within the group focusing on the underlying determinants. The comprehensive reviews of the empirical literature on tourism demand by Crouch (1994a, 1994b, 1995), Witt and Witt (1995), Lim (1997, 1999) and Li et al (2005) Suggest a substantial agreement regarding both the tourism demand measures and the variables that are important in explaining international tourism flows. A lot of these existing empirical works have used tourist arrivals/departures and tourism receipts/expenditures as dependent variables. The number of overnight the tourists stays in their destination countries and the average length of stay has also been studied, but much less frequently.

As for the explanatory variables, empirical models of tourism demand borrow heavily from 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 demand shifters. As a result, income and prices are the most commonly used variables in terms of the major factors influencing tourism demand.

Given that the leisure tourism is generally regarded a luxury good, the income remaining after expenditures on necessities, or the so-called discretionary income would be the preferred income variable. However, discretionary income is a subjective variable and is not precisely measurable. Therefore, most researchers have relied on the nominal or real (per capital) personal, disposable, or national income, as well as GDP as measure for income in origin countries.

Apart from being sensitive to their own income, tourists are also sensitive to prices. The tourism includes two price elements: the cost of travel to the destination and the cost of living in the tourist destination. Also, the literature shows that the most often employed variables aimed at measuring the cost of living at the tourist destination relative to the origin country (and possibly to alternative destinations) have been relative consumer price indices. However, their deficiency comes from the fact that the expenditure patterns of a tourist might be quite specific and therefore different from that of the average household in a certain country. As a result, some studies have used specific price indices such as hotel, drink and tobacco, shopping, meals, and entertainment and other variables. However, we should understand that the work of

Martin and Witt (1987) has shown that such tourism-specific indices do not perform any better than the overall price indices.

Studies often use exchange rate in tourism demand model in addition to/or combined with the relative price variables. There is some group of authors that argued that tourists respond to exchange rate movements much more than to changes in relative inflation rates when they make decisions on the travel destination (Artus, 1972). However, Martin and Witt (1987) argued that the exchange rate alone is not an acceptable proxy for tourism costs. Most empirical works on tourism demand models have used the exchange rate adjusted for relative prices (i.e. real exchange rate) to capture the substitution between domestic vacations and international travel. In this way, the impacts of (relative) inflation and exchange rate movements are measured through a single variable.

There has been less attention on transportation costs in the literature due to the fact that there is lack of adequate measure of effective transportation costs. In countries where the most of the tourists arrive by car, the proxy are usually oil or gasoline prices while in the case of far-off destinations, airline fares represent the preferable alternative. In the latter case, according to Mervar and Payne (2007), data problems arise due to the pricing practices of airlines that often include “special” have that are difficult to collect and use for an empirical analysis. Furthermore, multicollinearity between the transportation cost and income variables presents an often cited reason for omitting the transportation cost variable from tourism studies (Lim, 1999).

Furthermore, the dynamics of tourism demand has been incorporated in a lot of studies to account for lagged effects of supply constraints in the form of shortages in

hotel accommodation, passenger transportation capacity and trained staff, which cannot be adjusted rapidly. Sometimes, a time trend is included to capture qualitative factors in the tourist destination or changes in tourist faster for foreign travel. Also, dummy variables are employed in order to capture the impact of wars, political crises or natural disasters, as well as seasonal variations.

Given the above, tourism demand model is usually estimated as a function of income of tourists origin country, transportation costs between destination and origin, exchange rates, relative prices, dummy variables and the deterministic trends. Despite the fact that in the literature, annual data is often used, there has been increasing use of quarterly data in recent literature, which is in line with the increasing interest in the seasonality of global tourism flows (L et al. 2005). In terms of the estimation techniques, the log-linear regressions are the most frequently employed functional forms as the estimated coefficients can be interpreted as elasticities. However, while traditional econometric technique dominated studies up to the mid-1990s, the use of cointegration, vector autoregressive model, almost ideal demand systems, and time-varying parameter models have since become familiar approaches. Thus, given the fact that the trend parallels the overall trend in applied econometric studies since it has been shown that most time series data are not stationary and, therefore, the use of traditional econometric techniques may seriously affect the credibility of the results (Mervar and Payne, 2007).

However, some studies have tried to forecast the demand for tourism for a particular period of time using various forecasting methods. Martin and Witt (1989) compared the accuracy of several quantitative methods in forecasting tourism demand in an international context; Johnson and Ashworth (1990) had survey articles on the

determinants of tourism demand; Witt and Witt (1995) reviewed about sixty five empirical studies on the tourism demand; while Sinclair and Stables (1997) made a synthesis of several tourism analyses, discussing and particularly the use of different kinds of models, with explicit consideration of the single-equation and system of equations approaches, and their respective advantages and disadvantage.

Thus, studies on the determinants of tourism demand are subjected to specific problems. The reasons to the problems according to Mello et al. (1999) are twofold: the special nature of the demand for tourism, which can be attributed to the complexity of the motivational structure underlying the decision-making process, and the scarcity of relevant data that are fundamental in econometric modeling. The quantitative studies of tourism demand require the framework of a formal mathematical model that can provide estimates of the sensitivity of demand to changes in the variables on which it depends. The econometric modeling also supplies a good basis for accurate forecasting that is of considerable value for policy purposes and an important element in public and private investment decisions.

However, tourism demand modeling is not easy due to the complexity of the decision-making process, the multiplicity and heterogeneity of the products and services specified, the fact that transportation plays a role in the consumption of tourism, the inter-temporal dependence of current demand on its past and future values, and the non-separability between leisure consumption and labour supply and/or between tourism demand and the demand for other goods and services. These difficulties in the specification of a comprehensive and reliable model of demand for tourism are

compounded by the existence of unquantifiable factors influencing demand, as well as by the inaccuracy or unavailability of data for those that are, in principle, measurable.

Thus, the conceptual and practical problems underlying the empirical studies in this area accounted for the simplifying assumptions that investigators make in their attempts to specify econometric models for explaining the behaviour of tourism demand. So long as the assumptions do not distort the estimated results, they perform an important role in facilitating the provision of information which can be useful for policy formation and decision making. When the assumptions are inadequate and questionable, they give rise to models that may embody misspecification bias, leading to accurate and unreliable estimation results that cannot be used for any sound inference and forecasting or policy purposes.

The major examples of this latter type of models can be found in the single equation approach within a static context. These adhoc models lack the theoretical basis within which the reasonable testable hypothesis of consumer theory can be included and often neglect the possible interdependencies among competing destinations Mello et al. (1999). Also, they usually ignore the dynamic nature of demand for tourism, disregarding the possibility that the sensitivity of tourism demand of its determinants may differ between different time periods. Modeling procedures constrained by these theoretical faults lead to empirical inadequacies, such as the omission of relevant variables and incorrect functional form that result in misspecified models and biased estimates.

Thus, given the above, we have discovered that in the literature of empirical studies of tourism, there are two main types. The first consists of those that prefer modern time series and cointegration techniques in the attempt of modeling and forecasting the

dependant variable, between one or several pairs of countries (see Song et al. (2000), Kulenderan and Witt (2001), Seddighi and Theocharous (2002), Song et al. (2003 and Dritsakis (2004)). The second type includes those studies that estimate the determinants of international tourism demand using classical multivariate regressions (see couch, 1994), Witt and Witt (1995), and Lim (1997)).

Therefore, in this study we explore these two types of models, vis a vis, single equation and system of equation using annual panel data. The use of these two models will really afford us to make comparative analysis on the outcome of the two results so as to really know the model that suit the explanation of the demand for tourism.

III. METHODOLOGY

The model for specification in this study shall follow the empirical model of Halicioglu (2004), which looked at the influence of world income, relative prices and transportation cost on tourism arrivals. Though, this model will be remodified to the deal with the reality in the African continent. And this is the fact that there is political dimension to tourism demand in the continent that are not considered in the Halicioglu (2004) model. Thus, we readjust the model to include political dimension to tourism demand and this is by including crime rate, political instability and temorism attack into the model (see Naude and and Saayman (2004) and Odularu and Kareem, 2007). Infrastructural variable such as number of fixed and mobile available for tourists in the continent will also be included. Thus, specify the system equation model as follows:

$$InTA_{it} = \alpha_{i0} + \alpha_{i1}InWY_{it} + \alpha_{i2}InCPI_{it} + \alpha_{i3}InEXC_{it} + \alpha_{i4}InCR_{it} + \alpha_{i5}POL_{it} + \alpha_{i6}InTEL_{it} + \alpha_{i7}InTA_{it-1} + \varepsilon_{it} \text{ --- (1)}$$

Here, $i = 1 \dots N$, that is, the 20 countries that is selected for the study. TA is the total tourist arrivals in African, WY is the real world income, CPI is the exchange rate adjusted to relative prices between Africa and the rest of the world, CR is the crime rate measured by the incidence of recorded crime rate on the continent, POL is the measure of political instability and Tel is the number of fixed and mobile telecommunication services. We expect that $\alpha_1 \alpha_6 > 0$, and $\alpha_2, \alpha_3, \alpha_4, \alpha_5 < 0$. This study shall cover the period between 1995 to 2003.

IV. ESTIMATION TECHNIQUE

Panel data analysis shall be used in the study to estimate the demand for tourism in Africa. Its specification is given as:

$$X = V \beta + \alpha + N$$

For $j = 1, \dots, Z$ and $t = 2, \dots, T$. X here is the tourist arrivals of country j in period t. β is a $1 \times k$ vector of explanatory variables. α is the fixed effect estimates. The fixed effect estimator will allow us to show the short term and specific country/cross-section effects. The use of panel data technique will give us the avenue to address traditional econometric problems in cross-country regression such as unobserved country effects, outliers, dynamics and model uncertainty. Generalized method of moment (GMM) will also be used in order to deal with the problem of endogeneity that might arise.

V. EMPIRICAL RESULT

We present different results in this section in order to make adequate comparison among them. The results of single equation ordinary least square (OLS), fixed/random effects, two stage least square and that of the dynamic panel generalized method moment are given here. The essence of these comparative results is to really determine the factors that influence tourist arrivals to African destinations.

THE SINGLE EQUATION RESULT

The result of the single equation OLS is presented in three different ways (after minimizing the simultaneity and interdependence problems that lead to endogeneity)

Table 4: Ordinary Least Square Result

Variable	Fixed Effect	Random Effect	None
Constant	0.0824 (0.05)	1.8281 (3.16)***	1.1833 (1.80)*
ln TA (-1)	0.6756 (2.76)***	0.6038 (3.76)***	0.7457 (6.45)***
CPI	-0.0001 (-0.22)	-0.0001 (-0.30)	-9.47E-05 (-0.14)
Exc	-7.06E-05 (-2.75)***	-6.32E-05 (-1.73)	-2.99E-05 (-1.07)
lnCrime	0.0197 (0.46)	-0.0470 (-1.36)	-0.0431 (-1.07)
lnTeline	0.6795 (3.58)***	0.4735 (2.31)**	0.2578 (2.05)**
Pol	0.0509 (0.87)	0.0766 (1.39)	0.0732 (1.4171)
WY	0.0136 (0.34)	0.0187 (0.59)	0.0857 (0.88)
Adj R2	0.92	0.86	0.91
F-Stat	108.05***	70.5***	56.7***

Source: Author's calculation

This result shows that in the first column that has the fixed effect, the previous arrivals that has a significant positive effect on the present arrivals in Africa. The reason is that as tourists come to the continent and they feel comfortable, they would recommend the same destination to prospective tourists in their environment. The price index (CPI) is negatively related to the numbers of arrivals, though statistically insignificant. This means that as things get expensive in the destination country, it will serve as a wrong signal to tourists as this depletes their purchasing power. The exchange rate is inversely related to tourist arrivals, though statistically relevant. This means that as the value of destinations' currencies become better, there may be loss of welfare to international tourist because they will have given more of their domestic currencies for the destinations currencies. Crime rate in the destinations will not have any negative effect on the tourists as their degree of responsiveness is very low. Number of telephone line, a measure of infrastructure is positively related to tourist arrivals and significant. Political instability and directly related to tourist arrivals to Africa. This means that there are still influx of tourists to African destinations despite the political instabilities in most of the destination countries, thus, this contradict the result of Eilat and Einav (2003).

The random effect result also has similar result with that of fixed effect except that the crime rate is now having negative effect on tourists arrivals and the degree of responsiveness of tourists to crime rate is inelastic. This same result is obtained for a none fixed and random effect OLS model. The result shows that consumer price index, exchange rate and the natural logarithm of crime rate have inverse effects on the tourist arrivals. However, in all these three different results, the autonomous variable, constant,

is directly related to tourist arrivals, and this means that if nothing is done to woo potential tourists to Africa. There will be influx of arrivals to the continent.

Care should be taken in fully relying on this OLS result because it has been identified that the single equation models are liable to biases and inconsistent estimates since they did not take into consideration, the endogeneity of some of the regressors, they ignored dynamics and throw away information (Attanasio, et al. 2000). Thus, they may suffer from omitted variable bias. To overcome these problems, it is necessary to specify multiple or system of equations using panel techniques. Thus, the result of the two stage least square is given in table 5 below.

Table 5: Panel Two Stage Least Square Result - Static

Variables	Fixed Effect	None
Constant	-12.9145 (-1.72)*	-8.1934 (-1.47)
In TA (-1)	3.2085 (2.59)***	2.2612 (2.65)***
CPI	-0.0023 (-3.84)***	-0.0024 (-2.73)***
Exc	-2.10E-05 (-0.59)	-0.0002 (-2.73)***
InCrime	-0.1877 (-1.85)*	-0.1486 (-2.29)**
InTeline	0.5345 (2.85)***	-0.6688 (2.84)***
Pol	-0.1032 (-0.73)	0.0782 (0.59)
WY	-0.1333 (-1.06)	0.0701 (0.77)
Adj R2	0.89	0.91
F-Stat	1.17E-18	1.02E-19

Source: Author's calculation

This two stage least square only presents two different outcome, from fixed effect and none cross-sectional effect angle. We could see that we the system of equations, the result has drastically changed to that of OLS above. Here, all the outcomes show that the autonomous variable, constant, has negative effect on Africa's tourist arrivals. This means that if the regressors in the model are put into consideration and there is no encouragement,. Provision of infrastructure and political stability in the continent. Then the continent will not be attractive for tourists and there will be reduction in the number of arrivals.

Both outcomes of the two stage least square also show that the previous tourists number have statistically significant influence on the present tourist arrivals. Their degree of responsiveness is elastic, meaning that the prospective tourists are very significant to previous treatment and hospitality given to previous tourists. The two results show that tourists are very sensitive to prices in Africa, though the degree of responsiveness is inelastic (confirmed by Eilat and Einav , 2003; and Naude and Saayman 2004). Exchange rate for both outcomes in the two stage least square is negatively related to tourist arrivals. This means that as the destination countries currencies get appreciated there will be loss of welfare to the tourists and this is in form of giving more of their domestic currencies to destinations currencies, and this will make their travels and adventures more expensive. Their degree of responsiveness to exchange rate appreciation is elastic and statistically significant at the non cross-sectional effect level. The measure of infrastructure in both outcomes of two stage least square (Teline) has statistically significant direct effect on tourist arrivals. This means that as more and more infrastructural facilities are provided in the continent, tourists are eager to come and

explore the opportunities and endowments that are embedded in Africa. The coefficient of the variable that stands for elasticities indicate that the variable is inelastic at both outcomes. Here, the political instabilities in different parts of the continent have adverse effects on tourist arrivals. This shows that tourists are sensitive to what is happening in the polity before embarking on their trips. World income has an inverse relationship with arrivals under fixed effect, while direct effect in the none cross-sectional case. This reason for this is that since the fixed effect captures the individual destination effect and there are crises in some of these destinations in Africa, then even if the tourists have more income to spend on tourism, they will not prefer coming to the crises ridden destinations.

Table 6 shows the result of the dynamic panel data techniques used in this study. The dynamic result gives four different outcomes of the technique vis a vis, fixed effect, random effect, difference and the orthogonal deviation. The dynamic results show that in all the four outcome of the model, consumer price index, a measure of relative price in the destinations is inversely related to the number of arrivals. The significant of this variable in all the outcomes except that of difference model, indicate that prices are important factors that tourists consider in their choice of destinations in Africa and the degree of responsiveness of tourist to changes in prices is inelastic in the models of the dynamic panel analysis. Exchange rate in all these models is also inversely related to tourist arrivals, indicating that appreciation of destinations currencies often discourage prospective tourists from coming to Africa. It is important to note that this variable is significant at 5 per cent level for all the models and it is highly inelastic. Crime rate in the continent also has an inverse effect with the tourist arrivals, that is, as the incidence of

crime increases in the destinations, there will be reduction in the inflow of tourists to those destinations.

Table 6: Panel GMM Result - Dynamic

Variable	Fixed Effect	Random Effect	Difference	Orthogonal Deviation
Constant	-8.1934 (-1.94)*	-0.1205 (-0.54)	-	-
ln TA (-1)	2.2612 (2.93)**	1.0512 (34.66)***	2.6020 (2.53)***	2.2612 (2.62)***
CPI	-0.0024 (-2.47)**	-0.0007 (3.35)***	-0.0018 (-128)	-0.0024 (-2.62)**
Exc	-0.0002 (-2.36)**	-3.45E-05 (-2.05)**	-0.0002 (-1.94)**	-0.0002 (-2.45)**
lnCrime	-0.1486 (-1.61)	-0.0386 (-2.35)**	-0.0490 (0.43)	-0.1486 (-1.38)
lnTeline	0.6588 (3.91)***	0.1187 (-2.80)***	0.6774 (5.74)***	0.6588 (5.91)***
Pol	-0.0782 (-0.68)	0.0322 (1.0081)	0.0131 (0.14)	-0.0782 (-0.60)
WY	0.0701 (1.10)	0.0157 (0.82)	0.0451 (0.77)	0.0701 (1.10)
Adj R2	0.94	0.86	0.84	0.86

Source: Author's calculation

The lagged value of tourist arrivals which is the number of previous tourist arrivals, the number of available telephone lines and world income all have direct effects on the number of tourist arrivals. The number of telephone lines for the four outcomes are statistically significant indication that it is an important factor that influences tourists' choice of destinations. The same can be said to the previous number of tourist arrivals in the continent, as all the outcomes show that this variable is relevant determinant of tourist demand and interesting thing here is that the autonomous variable indicates that if countries of destinations do not make efforts to develop tourism through improvement in infrastructure, crime rate and the political situation, there will be reduction in the number

of tourist arrivals in Africa. These results contradict with those of the OLS results we got in table 4 above.

Therefore, the results of this study have shown that the dynamic panel data analysis is a better technique in explaining the factors that influence tourism demand in Africa, since it is always used to correct for endogeneity problems, the issue of heteroscedasticity and dynamics of the variables.

VI. CONCLUSION

We have tried in this study to econometrically determine factors that influence the demand for tourism in Africa. Analysis has been done on the structure, pattern and trend of African tourism overtime.

In selecting the variables for this study, we considered both the endogenous and exogenous variables. That is, we have selected the economic variables as well as the socio-political variables that influence the tourists' choice of destinations.

In this study, we specified the single equation model and that of system of equations. The single equation model makes use of OLS estimators with fixed and random effects, while the system of equation makes use of the two stage least square and the dynamic panel data technique.

We find out from the analyses of this study that political instability, crime rate, exchange rate appreciation and consumer price index serve as signal to prospective tourists to the continent. However, the previous tourist arrivals, number of telephone lines, a measure of infrastructure, and world income, positively influence or determine tourist arrivals to Africa. Another interesting thing we found out in the study is that the

results of system of equations are better than that of single equation model and this result was confirmed by Naude and Saayman (2004), Eilat and Einav (2003)

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