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Full Length Research Paper

An econometric analysis of the determinants impacting on businesses in the tourism industry

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This article estimated the determinants of tourist arrivals in South Africa for the period 1999 to 2007. A tourism model was estimated and the results revealed several factors to be main determinants of tourist arrivals in South Africa. From a business perspective, these factors should seriously be considered to provide tailor-made services to potential tourists. The results also indicated that Angola, Australia, Austria, Belgium, Germany and Namibia have unexploited tourism potential. The article recommended that an improvement of infrastructure, maintaining a competitive exchange rate and price stability are important factors for attracting tourists to South Africa. Focus can also be placed on facilitating regional integration within the African continent to encourage tourists to visit South Africa.

Key words: Tourism, demand, panel, South Africa, Africa, tourist.

INTRODUCTION

The travel and tourism sector is the largest export earner in the world and generates foreign exchange that exceed those from products such as petroleum, motor vehicles, textiles and telecommunication equipment since the late nineties (Eilat and Einav, 2004). Studies by Giacomelli (2006) and Eilat and Einav (2004) indicate that tourism is a labour intensive industry, employing about 100 million people around the world which accounts for 8.3 % of world employment. The World Travel and Tourism Council (2006) indicated that tourism accounts for about 10 % of world Gross Domestic Product (GDP). Tourism is important in the economical welfare of a country as it generates revenues required to finance infrastructure and other projects that promote economic development. Tourism expenditure can also enhance domestic tourism construction and increase physical capital (Lee and Chang, 2008). If businesses know the origin of its customers and their needs, a more advanced service and product can be offered. This could contribute to a higher average expenditure per tourist and a concomitant increase in general business revenue.

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In South Africa, tourism accounted for between 8.2 and 8.7% of GDP and between 7.5 and 8% of employment during 2006 (Abedian et al*.,* 2006). The sector contributed 7.9% to GDP and 8.1% to employment in 2007 (South African Tourism, 2007). The South African government has recognised the role of tourism in the country's economy. In 2005, under the Accelerated Shared Growth Initiatives South Africa (ASGISA), the government identified priority sectors that need to be developed and promoted in order to accelerate growth and halve poverty by the year 2014 (Presidency Republic of South Africa, 2006). Among these sectors, tourism was identified for special priority attention. Government's decision was based on the tourism sector's relatively high growth performance and the potential to increase the tou-rism industry's contribution to GDP from 8 to 12 % which could lead to increased employment. Given tourism's importance and role in the economy, it is important to investigate factors that determine tourism in South Africa. The underlying factors explaining the nature and potential of demand for tourism are relatively similar across countries. Some of the main determinants of tourism de-mand include factors such as demographic, geographic, socio-cultural, economic, technological, cultural and politi-cal (Middleton and Clarke, 2001; Naudé and Saayman, 2005). More specifically, tourism determinants can refer

to income, relative prices of goods and services purchased by tourists at the destination, exchange rates, marketing expenditure to promote the country, economic activity indicators, mobility, government, media communications and information and communications technology which drive and set limits to the volume of a population's demand for travel (Dwyer et al*.,* 2002; Eugenio-Martin, 2003; Rosselló et al*.,* 2005; Eugenio-Martin et al*.,* 2008). Several determinants of tourism demand have been identified, which will briefly be elaborated upon later.

In light of the above, the objective of this paper is to investigate factors determining the tourist arrivals in South Africa using an econometric model. The article also investigates whether there is any unexploited tourism potential between South Africa and its trading partners in tourism. The paper is structured to provide an overview of tourism, followed by a description of a tourism model. Thereafter, the estimation methodology is discussed with a presentation of the univariate characteristics of the data. Finally, the estimation results are discussed and conclusions drawn from the findings.

OVERVIEW OF TOURISM IN SOUTH AFRICA

Many developing countries have used tourism as a possible source of growth, because it has the potential to promote regional development, and generate income, jobs and foreign exchange (Sinclair, 1998; Pearce, 1999; Eugenio-Martin et al., 2008). The South African government has committed to alleviating poverty by focusing on the potential of tourism to generate income. Business in general may benefit substantially from an increased level of tourism expenditure as higher levels of job creation cause lower levels of poverty and potentially lower criminal activity which could promote business profit.

In terms of the African continent, South Africa has strong participation with the Southern African Development Community (SADC) and has focused much of its tourism growth strategy on the six bordering SADC states (South African Tourism, 2007, 2008). The SADC comprises of 15 sub-Saharan African countries including Angola, Botswana, Democratic Republic of Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe. Internationally, the globalisation of markets has opened up many opportunities. One example relates to major international hotel groups and airlines vying to serve tourists in South Africa and Africa (Bennett et al., 2005).

South Africa experienced a boom in tourism since the late nineties. The total number of tourist arrivals in South Africa for the period 1999 to 2007 is presented in Table 1. Please note that the continent with the highest number of tourist arrivals is marked in bold. From Table 1 it is evident that the total number of tourist arrivals in South Africa increased by nearly 54% from 2001 to 2007, with the main source of tourist arrivals from other African countries. Table 1 also indicates the composition of tourist arrivals in South Africa by continent and shows that tourists from Africa increased from 4 353 259 of the total 6 026 086 in 1999 to 6 867 726 of the total 9 092 231 in 2007. On average, Africa accounted for about 70 % of total tourist arrivals in South Africa with Europe and North America as the second and third main sources. The large percentage of tourists from Africa suggests that South African businesses should align themselves to serve the increasing numbers of African tourists. Furthermore, such businesses should identify specific needs of these tourists to ensure an experience that will lead to follow-up visits. The top thirteen sources of tourist arrivals by countries are presented in Table 2, with the country with the highest number of tourist arrivals marked in bold. Table 2 shows that neighbouring and Southern African Development Community (SADC) countries were the main sources of tourist arrivals in South Africa during 2007.

According to South African Tourism (2005) the contribution of tourism to the economy is characterised by three components. The first is the direct tourism expenditure on accommodation, transport and recreation. The second component is the expenditure on goods such as food, which contributes indirectly to tourism. The third component is the expenditure on capital goods which contribute indirectly to tourism such as property, houses, vehicles, artwork, furniture, jewellery and financial assets. Capital expenditure by tourists is random and when it occurs, the impact on total foreign direct spend is significant (South African Tourism, 2007). The total foreign direct spend by tourists in South Africa is presented in Table 3. Table 3 shows that total foreign direct spend by tourists increased by 39% from R43.2 billion in 2004 to R60.1 billion in 2007. According to South African Tourism (2005), tourism has become the "new gold" of the South African economy because total foreign direct spend exceeds gold exports of R28 billion. Tourists from African countries are main spenders followed by Europe and the Americas. More specifically, Mozambique, Zimbabwe, Botswana, Lesotho, Swaziland and Namibia are the leading spenders among African countries. Based on these figures, businesses can reap higher profits given that they provide the products and services required by the average African tourist. The main over-seas spenders are UK, Germany and USA. The increase in tourist arrivals and foreign direct spend by tourists resulted in the number of new jobs created to increase from 1 024 520 (465 710 direct and 558 810 indirect employment) in 2004 to 1 059 880 (478 630 direct and 581 250 indirect employment) in 2005. However, employment generated decreased to 941 000 (413 100 direct and 527 900 indirect employment) in 2007. This decline in employment contribution by the tourism sector in 2007 is not surprising because, the total foreign direct spend, as shown in Table 3 decreased from R66.5 billion

Table 1. Tourist arrivals in South Africa by continent.

Continent	1999	2000	2001	2002	2003	2004	2005	2006	2007
Africa	4353259	4298613	4193732	4513694	4519616	4707384	5446062	6308636	6867726
Europe	1026748	1048923	1031229	1273822	1343379	1312309	1334225	1412653	1413563
North America	202095	210349	204773	222345	228244	251536	280808	309697	329906
South America	43374	47348	45269	39486	41778	46625	49417	56023	57473
Australasia	70307	71161	76442	87136	90391	94305	97083	109754	115226
Asia	155352	156600	155100	184555	186274	195943	196702	217398	218164
Middle East	29525	29460	30660	34352	32860	32849	34913	38209	41186
Other (unspecified)	145426	138084	170819	194526	197553	174251	79110	56436	48987
Total	6026086	6000538	5908024	6549916	6640095	6815202	7518320	8508806	9092231

Source:StatisticsSouthAfricaandSouthAfricantourism.Annualreports2002-2007, Availableat http://www.southafrica.net/satourism/research/research.cfm.

Table 2. Top 13 sources of tourist arrivals in South Africa.

Country	1999	2000	2001	2002	2003	2004	2005	2006	2007
Botswana	554923	563365	644253	782189	797315	806820	798455	765705	818403
Lesotho	1588365	1559422	1288160	1162786	1291242	1479802	1668826	1919889	2170074
Malawi	69686	70732	77680	95518	89469	89743	107258	124914	147246
Mozambique	473939	491526	506077	579768	474790	405579	648526	926496	1084157
Namibia	201685	206022	203667	217077	216978	226525	220045	225020	220535
Swaziland	785062	742621	751538	788842	809049	852636	911990	993030	1039233
Zambia	67682	75882	96666	123081	115650	122512	128390	160984	183056
Zimbabwe	494530	477380	501698	612543	568626	558093	783100	989614	964027
USA	173533	181632	176412	187681	192561	213322	238935	259 676	276941
UK	343934	358072	363825	449088	463021	463176	476770	495 532	497687
Netherlands	87606	93091	97780	111873	122565	122271	117855	126 327	129022
Germany	211052	215011	207511	253411	261194	249564	253471	263 225	254934
France	87887	92750	85663	114797	130365	111636	103674	108 713	115074

Sources:Statistics SouthAfricaandSouthAfrican Tourism. Annual Reports 2002-2007, Available at http://www.southafrica.net/satourism/research/research.cfm.

in 2006 to R60.1 billion in 2007.

METHODOLOGY

The demand for tourism in South Africa is neglected in the economic research literature with little attention to developing countries, particularly Africa. Two exceptions are the study of tourist arrivals in 43 African countries undertaken by Naudé and Saayman (2005), and the study on the impact of tourism on economic growth and development using panel data of 42 African countries by Fayissa et al. (2008). One study by Lim (1997) reviewed more than 70 studies on international tourism demand, with not one of them focusing on African countries. At this point, it may be valuable to define an international tourist, namely a person who travels to, and stay in countries other than their normal country of residence for less than a year (Middleton and Clarke, 2001). Many research studies address the determinants of tourism demand through different empirical techniques. Some studies use time series and co-integration econometric techniques to investigate the determinants of tourism demand to enable them to forecast future tourist arrivals (Durbarry, 2000; Cheung and Law, 2001; Divisekera, 2003; Katafono and Gounder, 2004; Narayan, 2005). Other studies deal with determinants of tourism using panel data econometric techniques (Walsh, 1997; Luzzi and Flückiger, 2003; Eilat and Einav, 2004; Naudé and Saayman, 2004; Rosselló et al., 2005). This study focuses on using panel data and the demand for tourism from country *i* to country *j* is specified as:

$$TA_{ij} = f(Y_j, P_i, ER_{ij}, TC_{ij}, INFRA_i, INFRA_j, O_{ij}) \quad (1)$$

where TA_{ij} is the number of tourist arrivals in country *i* from country *j*, Y_j is the income of country *j*, P_i is price or cost of living in country *i*, ER_{ij} is the exchange rate measured as units of country *i*'s currency per unit of country *j*'s currency, TC_{ij} is the transport costs between country *i* and country *j*, $INFRA_i$ and $INFRA_j$ are the measure of infrastructure in country *i* and *j,*

Table 3. Total foreign direct spend in South Africa - excluding capital expenditure (in Rand million).

Country	2004	2005	2006	2007
All foreign tourists	43 220	53 429	66555	60114
Africa and Middle East	27 572	36 712	46586	38903
Angola	272	315	352	409
Botswana	2 952	5 481	3746	2676
Kenya	414	181	204	204
Lesotho	3 867	4 984	3870	4573
Malawi	639	811	1095	1065
Mozambique	7 469	10 877	19459	15560
Namibia	1 387	1 437	1639	1076
Nigeria	189	241	411	415
Swaziland	3 187	3 799	4129	3681
Tanzania	126	107	106	91
Zambia	872	851	1032	1203
Zimbabwe	4 244	6 498	9310	6535
Unspecified	1 217			
Other Africa and Middle East	1 004	1 124	1233	1415
Americas	2 281	2 941	3734	3856
Brazil	159	249	299	267
Canada	307	376	517	565
USA	1 638	2 100	2788	2872
Other Americas	174	215	130	152
Asia and Australasia	2 328	2 133	2333	2864
Australia	671	600	796	835
China	488	313	393	522
India	319	410	462	446
Japan	151	126	289	231
Other Asia and Australasia	697	681	393	830
Europe	11 039	11 217	13902	14491
France	726	685	910	815
Germany	2 165	2 219	2794	2746
Italy	378	364	405	395
Netherlands	990	960	1375	1437
Sweden	290	295	353	375
UK	4 087	4 039	4748	5685
Other Europe	2 400	2 653	3317	3037
Unspecified		425		

Source: South African Tourism. Annual reports 2002 - 2007, Available at http://www.southafrica.net/satourism/research/research.cfm.

and O_{ij} represents any other factor that determines the arrival of tourists from country *i* to country *j*. For estimation purposes, Equation (2) is specified in log form as:

$$\text{LN } TA_{ij} = \gamma_0 + \gamma_1 \text{LN } Y_j + \gamma_2 \text{LN } P_i + \gamma_3 \text{LN } ER_{ij} + \gamma_4 \text{LN} TC_{ij} + \gamma_5 \text{LN } INFRA_i + \gamma_6 \text{LN } INFRA_j + \gamma_7 \text{LN} O_{ij} + \varepsilon_{ij} \quad (2)$$

The variables chosen will briefly be explained. As Lim (1997) states, the disposable income levels of tourists from the source country are the most widely used explanatory variable when measuring tourism demand. In developed countries, tourism expenditure tends to rise and fall in line with the economic cycles of growth and recession. In developing countries, such as South Africa, the smaller tourism market may develop quickly as it responds to rapid economic growth (Middleton and Clarke, 2001). Generally, higher levels of disposable income cause people to travel more extensively (Dwyer et al., 2002; Law et al., 2004). Since disposable income data are hard to find, many studies use real GDP per capita, nominal or real GDP and GNP. This study used the GDP of the tourism source country as a proxy for income. An increase in income is positively related to the number of tourist arrivals, and hence, γ_1 is expected to be positive ($\gamma_1 > 0$).

The price of tourism is another most commonly used explanatory variable for tourism arrivals in many studies (Walsh, 1997; Middleton and Clarke, 2001; Luzzi and Flückiger, 2003; Katafono and Gounder, 2004; Naudé and Saayman, 2004; Oyewole, 2004; Greenwood, 2007). Any visit to a destination carries a price, which is the sum of what it costs for travel, accommodation and participation in a selected range of facilities and services (Middleton and Clarke, 2001). Price, which represents cost to customers in terms of money, time and effort, is relative to their spending power (George, 2004). Several main characteristics of tourism services also influence pricing such as the long lead times in holiday markets between price decisions and product sales, the high level of vulnerability to demand changes reflecting unforeseen international economic and political events, and high price elasticity in the discretionary segments of travel markets (Webber, 2001; Eugenio-Martin, 2003; Oyewole, 2004; Li et al., 2006). Most studies use the consumer price index as a proxy for the price of tourism services. A rise in price at the destination means that the cost of tourism services is increasing and this discourages tourist arrivals ($\gamma_2 < 0$).

The nominal exchange rate variable is added to the list of explanatory variables which is defined as the currency of the tourist destination country per currency of tourist source country. The exchange rate plays a very important role in the tourism industry and a declining monetary currency has both advantages and disadvantages: it becomes cheaper for tourists to visit a country where the exchange rate favours them; or it becomes expensive for tourists to visit a country when their own currency has low value (Bennett et al., 2005). For this study, the Rand/Euro exchange rate was chosen as opposed to Rand/USA dollar because the Euro zone accounts for the second highest source of tourist arrivals and tourist spending (after Africa). A depreciation of the exchange rate makes tourism goods and services cheaper and encourages tourist arrivals ($\gamma_3 > 0$).

According to Luzzi and Flückiger (2003), the cost of transport between the source and destination countries should take into account the cost of the journey as a whole. Tourism can affect the demand for certain services such as transportation (Lee and Chang, 2008). For air transport, which is usually the largest component of international tourism spending, tourists are affected by the routes that can be flown, the airlines available to fly specific routes, the number of flights available, the number of seats on routes as well as the prices that are charged (Middleton and Clarke, 2001). The demand for tourism would follow the supply of cheaper transport if the cost of transport could be significantly reduced through new economies of scale or through some technological, cost-saving breakthrough (Middleton and Clarke, 2001; Palhares, 2003). The price of crude oil can also severely affect the tourism industry and there is little doubt that with increasing fuel prices disposable incomes are likely to shrink through fuel-price induced inflation (The Herald, 2005; Njobeni, 2006). Despite the difficulty to get data on all components of transport costs, most studies have used distance between the source and destination countries. This study uses distance in kilometres between the tourist source and destination countries as a proxy for transport costs. An increase in transport costs causes a decrease in the number of tourist arrivals, and this means that $\gamma_4 < 0$.

A measure of infrastructure was added in recent research to explain tourism flows. One study used the number of hotel rooms to indicate that the country becomes more competitive as an indicator of tourism infrastructure (Naudé and Saayman, 2004). Tourism infrastructure refers to the accommodation, transport, other facilities and services (Middleton and Clarke, 2001). South Africa has identified infrastructure as one of the critical factors for unlocking tourism potential and commit to work closely to co-ordinate the 2010 tourism infrastructure development-drive that include a connectivity drive, accommodation drive and an efficient tourist and public transport system for the World Cup Soccer to be hosted in 2010 in South Africa (The Herald, 2007; Ensor, 2007). One recent concern in South Africa is the power outages and its possible impact on service delivery, safety and security in blacked-out buildings, the difficulty of organising staff as well as problems with laundry (Business Day, 2008). This study applies the current use of electricity generated in South Africa as well as the number of aircraft departures in the tourism source country to serve as a proxy for infrastructure. An improvement in infrastructure in both the destination and source countries promotes the number of tourist arrivals, hence, γ_5 and $\gamma_6 > 0$.

This study also introduced a number of dummy variables to represent countries that border South Africa, or which are members of the Southern African Development Community (SADC) and European Union (EU). After introducing the dummy variables, Equation (2) is re-specified as:

$$\text{LN } TA_{ij} = \gamma_0 + \gamma_1 \text{LN } Y_j + \gamma_2 \text{LN } P_i + \gamma_3 \text{LN } ER_{ij} + \gamma_4 \text{LN } DIS_{ij} + \gamma_5 \text{LN } INFRA_i + \gamma_6 \text{LN } INFRA_j + \gamma_7 BORDER + \gamma_8 EU + \gamma_9 SADC + \varepsilon_{ij} \quad (3)$$

Where, DIS_{ij} is the distance in kilometres between South Africa and its trading partners and is a proxy for transport costs. Countries which border South Africa or members of EU and SADC are given the value of 1 and a value of 0 otherwise. It is expected that membership of these two trade agreements increase the number of tourist arrivals in South Africa. Being neighbour to South Africa is also expected to increase tourist arrivals to South Africa. That means the coefficients γ_7, γ_8 and γ_9 is expected to be positive.

Estimation procedure

There are different models in panel data estimation namely pooled, fixed and random effects. The pooled model assumes that countries are homogeneous, while fixed and random effects introduce heterogeneity in the estimation. A decision should thus, be made whether to use a random or fixed model because individual effects are included in the regression. A random effects model is appropriate when estimating the model between a country and its randomly selected sample of trading partners from a large group (population). A fixed effects model is appropriate when estimating the model between a country and predetermined selection of trading partners (Egger, 2000). As this study deals with tourism arrivals in South Africa from 27 selected countries, the fixed effects model will be more appropriate than the random effects model. The top 27 countries were selected based on the tourism data for the period 1999 to 2007. In addition, the study uses the Hausman test to check whether the fixed effects model is in fact more appropriate than the random effects model. The fixed effects model will be better than the random effects model if the null hypothesis of no correlation between individual effects and the regressors is rejected.

The fixed effects model cannot estimate variables directly that does not change over time, such as distance, because inherent transformation wipes out such variables. Martinez-Zarzoso and Nowak-Lehmann (2003) suggested that these variables can be estimated in the second step by running another regression with individual effects as the dependent variable and dummies as explanatory variables. This is estimated as:

$$IEFF_{ij} = \gamma_0 + \gamma_1 DIS_{ij} + \gamma_2 BORDER + \gamma_3 EU + \gamma_4 SADC + \varepsilon_i \quad (4)$$

where $IEFF_{ij}$ is individual effects.

Univariate characteristics of the variables

The study uses annual data and the estimation covers the period 1999 to 2007. Detailed data description and their sources are given in the Appendix. Before estimating Equation (3), univariate characteristics of the data are analysed and this involves panel data unit root test. Testing for unit root is the first step in determining a potentially co-integrated relationship between variables. If all variables do not contain a unit root (they are stationary), the traditional ordinary least square (OLS) estimation method can be used to estimate the relationship between variables. If variables are non-stationary, a test for co-integration is required. The literature identifies three types of unit root tests. The first test was developed by Levin et al. (2002) and is referred to as the LLC test. The second test is that of Hadri (2000). These two types of panel unit root tests assume that the autoregressive parameters are common across cross-sections. The LLC uses the null hypothesis of a unit root while Hadri uses the null hypothesis of no unit root.

Im et al. (2003) developed a third type of panel unit root test called IPS. This test allows for autoregressive parameters to differ across cross-sections and also for individual unit root processes. It is computed by combining individual cross-section unit root tests in order to create a test that is specific to the panel. This test is more powerful than the single-equation Augmented Dickey-Fuller (ADF) by averaging N independent regressions (Strauss and Yigit, 2003). The Augmented Dickey-Fuller (ADF) specification may include intercept with no trend, or may include an intercept and time trend. It uses the null hypothesis that all series have a unit root, and the alternative hypothesis is that at least one series in the panel has a unit root. This test is one-tailed or lower-tailed based on the normal distribution. This study uses LLC and the IPS to test for unit root. The results for unit tests are presented in Table A1 in the Appendix. The IPS statistic indicates that all variables, with the exception of the Rand/Euro exchange rate, are stationary however, the LLC statistic shows that all variables are stationary. This study uses rejection of unit root by at least one test to assume a verdict of stationarity and as such implies that a test for co-integration is not required and Equation (3) can be estimated using the traditional estimation methods.

ESTIMATION RESULTS

Table 4 presents the results for the pooled, fixed effects and random effects models. The results in the second column of Table 4 are those of the pooled model which assumes that there is no heterogeneity among countries and no fixed effects are estimated. It is a restricted model because it assumes that the intercept and other parameters are the same across all trading partners. As such, the results of this model would be ignored. The results of the fixed effects model are in the third column of Table 4. The fixed effects model assumes that countries are not homogeneous, and introduces heterogeneity by estimating country specific effects. It is an unrestricted model as it allows for an intercept and other parameters to vary across trading partners. The F-test is performed to test for homogeneity of countries which rejects it at a one % significance level which means that a model with individual effects must be selected. The results of the random effects model are presented in the fourth column of Table 4 and also acknowledge heterogeneity among countries, but it differs from the fixed effects model because it assumes that the effects are generated by a specific distribution. It does not explicitly model each effect, and this avoids the loss of degrees of freedom which occurs in fixed effects model. The Lagrange multiplier (LM) test is applied to the null hypothesis of no heterogeneity and also rejects the null hypothesis of no heterogeneity in favour of random specification. In order to discriminate between fixed effects and random effects models, the Hausman specification test is used to test the null hypothesis that the regressors and individual effects are not correlated. If the null hypothesis is rejected, the fixed effects model will be the appropriate model. Failure to reject the null hypothesis means that the random effects model will be the preferred model. The Hausman test rejects the null hypothesis and this indicates that country-specific effects are correlated with regressors and suggests that the fixed effects model is the most appropriate model for this study. Therefore, the random effects model is inconsistent and thus not the appropriate model to use.

The results for all three models are consistent with the theoretical expectations because all coefficients have the expected signs. The interpretation of the results focuses on the fixed effects model because it is a more appropriate model as discussed earlier. The findings show that all the coefficients of the fixed effects model are statistically significant. The results of the fixed effects model also show that an increase in the trading partner's GDP income causes tourist arrivals to South Africa to increase. An increase (depreciation) in the Rand/Euro exchange rate attracts tourists to South Africa.

An increase in electricity generated in South Africa and improvement in the trading partner's infrastructure are both associated with an increase in tourist arrivals. Furthermore, tourists react negatively to increases in South African prices causing tourist arrivals to decrease by 0.686 %. This suggests that it is important to maintain price stability in order to attract tourists to South Africa. The results compare favourably with other tourism studies. Table A2 in the Appendix presents country specific effects. The country specific effects show the effects that are unique to each country but were not included in the estimation. They show that tourist arrivals in South Africa differ from country to country and each country is unique. There are unique features in some countries which promote tourist arrivals in South Africa including countries such as Botswana, Germany, Lesotho, Malawi, Mozambique, Namibia, Swaziland, United Kingdom, Zambia and Zimbabwe. These are countries with positive effects and the results are in bold print in Table A2. The country specific effects also show that there are countries' characteristics (unobservable) that discourage tourist arrivals in South Africa from countries with negative fixed effects (not in bold print in Table A2). An

Table 4. Estimation results.

Variables	Pooled model	Fixed Effects model	Random Effects model
Constant	-2.195(-0.174)	-13.190 (-4.952)***	-1.224 (-0.326)
Trading partner's GDP	0.291 (4.805)***	0.132 (2.153)**	0.173 (3.101)***
Rand/Euro exchange rate	0.314(0.733)	0.341 (3.793)***	0.331 (3.695)***
Electricity generated in South Africa	1.269(0.864)	1.807 (5.422)***	1.658 (5.051)***
Infrastructure of the trading partner (aircraft departure in trading partner country)	0.223 (3.574)***	0.132 (3.773)***	0.149(4.488)***
South African Consumer Price Index	-0.535 (-0.387)	-0.686 (-2.367)**	-0.636 (-2.196)**
Border with South Africa Dummy	0.871 (4.828)***		0.284 (2.070)**
Distance Dummy	-1.292 (-10.252)***		-1.397 (-4.788)***
European Union Dummy	0.402(3.468)***		0.161 (0.448)
SADC Dummy	0.604 (1.864)*		-0.407 -(0.445)
Adjusted R^2	0.779	0.991	0.694
F-test statistic		647.059***	
LM test statistic			935***
Hausman test statistic		132.011***	

Notes: ***/**/* significant at 1%/5%/10% significance level; t-statistics are in parentheses.

Table 5. Second stage regression results.

Independent variables	Coefficient (t-statistics)
Border with South Africa	2.160 (12.506)***
Distance	-0.144 (-17.462)***
European Union	0.428 (4.038)***
SADC	1.508 (9.754)***
Adjusted R-squared	0.833

***/**/* Significant at 1/5/10% significant level; t-statistics are in parentheses.

investigation of the factors which discourage tourist arrivals in South Africa from countries with negative fixed effects is important for policy making, as this would help to identify constraints to the tourism sector. Some factors which may explain the fixed effects in Table A2 in the Appendix are included in the second stage regression and are all significant. The second stage regression results as specified by Equation (4) and are presented in Table 5. The findings from Table 5 show that, as expected, having a border with South Africa encourages tourist arrivals. The coefficient of distance is negative which means that transport costs discourage tourist arrivals. Membership of the EU and SADC is generally associated with an increase in tourist arrivals in South Africa.

Tourism potential

The estimated fixed effects model in Equation (3) is simulated in order to determine the within sample tourism potential. The actual tourist arrivals are then compared to the potential tourist arrivals in order to see if there are countries with unexploited tourism potential. The results are presented in Figure 1. Figure 1 shows that Angola, Australia, Austria, Belgium, Germany and Namibia have unexploited tourism potential - at least from 2004 to 2006. A further analysis of each country should be done to identify possible constraints in order to take advantage of the unexploited tourism potential.

Conclusion

This paper estimated the determinants of tourist arrivals in South Africa for the period 1999 to 2007 from 27 tourist country sources. The main source of tourist arrivals in South Africa is from Africa, mainly SADC countries followed by arrivals from Europe and America. Africa accounts for about 70% of tourist arrivals and also account for about 68 % of total foreign direct spend in South Africa. The estimation results show that income

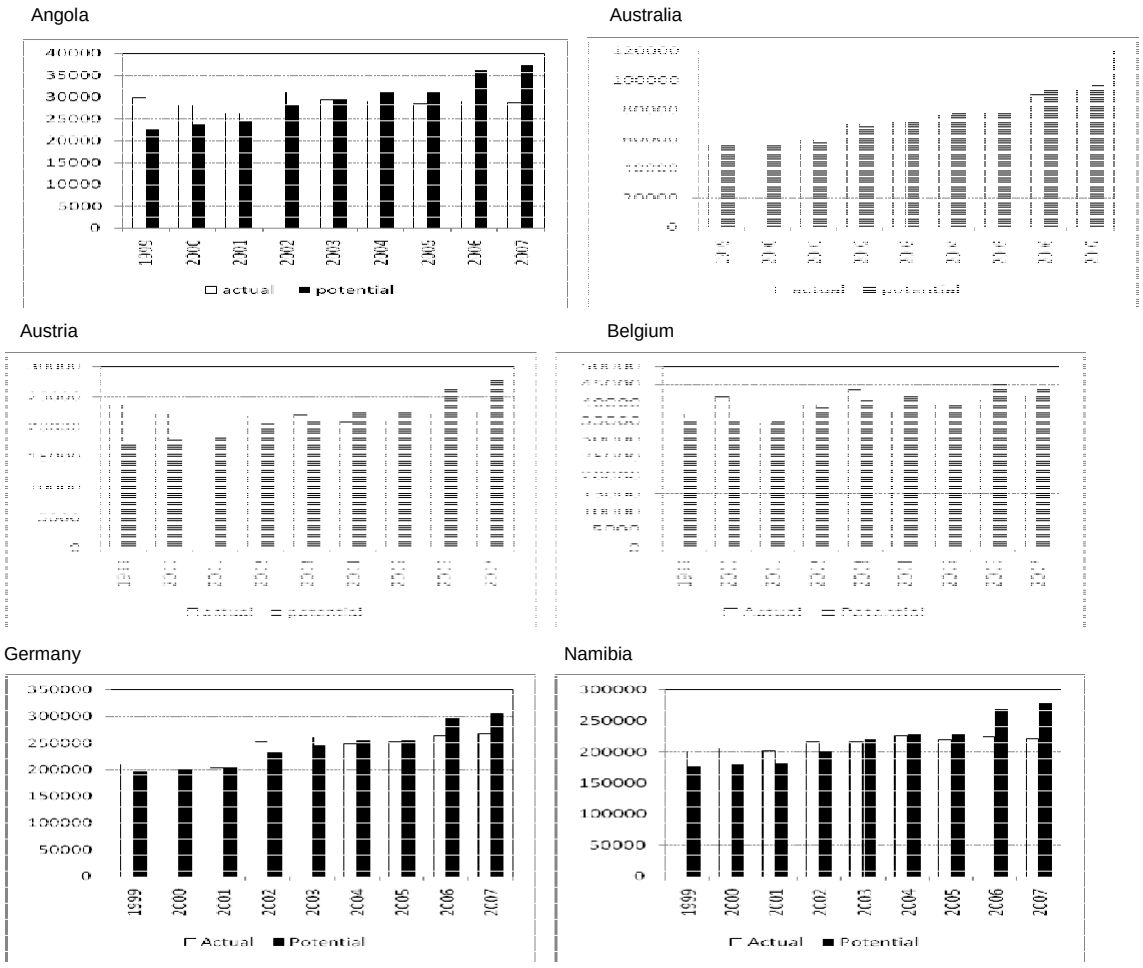

Figure 1. Tourism potential.

and infrastructure of the tourism source countries have positive effects on tourist arrivals in South Africa. Domestic businesses have to be cognisant of the origin of the main group of tourists to provide an improved service to these tourists. Of further importance are factors that either encourage or discourage tourist arrivals. Maintaining the exchange rate at a competitive level as well as keeping financial stability is important in order to attract tourists to South Africa. A depreciation of the Rand/Euro exchange rate attracts tourists, while a rise in South African prices discourages tourism. Transport costs increase the cost of travelling and therefore discourage tourist arrivals. It is further important to improve domestic infrastructure such as the supply of electricity in order to attract tourists. Having a border with South Africa or being a member of SADC and the EU is associated with an increase in tourism arrivals in South Africa and suggests that regional trade agreements and regional integration promote tourism. The results further revealed that there is unexploited tourism potential in Angola, Australia, Austria, Belgium, Germany and Namibia. A future study should aim to determine and identify possible factors that inhibit the realisation of the full tourism potential of these countries.

REFERENCES

Abedian I, De Wet W, Maserumula S, Pitso L, Pillay K, Matheba C (2006). A Framework/Model to Benchmark Tourism GDP in South Africa, Pretoria: Department of Environmental Affairs and Tourism, Department of Trade and Industry and South African Tourism.

Bennett A, Jooste, C, Strydom L (2005). Managing Tourism Services: A South African Perspective, 3rd edition, Van Schaik Publishers: Pretoria, South Africa.

Business Day (2008). Power cuts: Dark days for tourism, Business Day, 1 February, p 1.

Cheung C, Law R (2001). Determinants of Tourism Hotel Expenditure in Hong Kong, Int. J. Contemp. Hosp. Manage., 13(3): 151-158.

Divisekera S (2003). A Model of Demand for International Tourism, Annals Tour. Res., 30(1): 31-49.

Durbarry R (2000). Tourism Expenditure in the UK: Analysis of Competitiveness Using a Gravity-Based Model, Christel DeHaan Tourism and Research Institute Research Paper 2000/1, Nottingham, Nottingham University Business School.

Dwyer L, Forsyth P, Rao P (2002). Destination Price Competitiveness:

Exchange Rate Changes versus Domestic Inflation, J. Travel Res., 40(2): 328-336.

Egger P (2000). A Note on the Proper Econometric Specification of the Gravity Equation. Econ. Lett., 66: 25-31.

Eilat Y, Einav L (2004). Determinants of International Tourism: A Three-Dimensional Panel Data Analysis. Appl. Econ., 36:1315-1327.

Ensor L (2007). Transport, crime knock tourism. Business Day, 24 July, p 2.

Eugenio-Martin JL, Martin-Morales N, Sinclair MT (2008). The role of economic development in tourism demand.Tour. Econ., 14(4): 673-690.

Evidence from Unit Root Structural Break Tests, Appl. Econ., 37: 1157-1161.

Fayissa B, Nsiah C, Tadasse B (2008). Impact of tourism on economic growth and development in Africa, Tour. Econ., 14(4): 807-818.

George R (2004). Marketing South African Tourism, 2nd edn., Oxford University Press: Cape Town, South Africa.

Giacomelli A (2006). Modelling International Tourism Demand, Paper Presented at the Second International Conference on Tourism Economics, Palma de Mallorca, May. pp.18-20.

Greenwood C (2007). How do currency exchange rates influence the price of holidays?, J. Reven. Pric. Manage., 6(4): 272-273.

Hadri K (2000). Testing for Stationarity in Heterogeneous Panel Data, Econ. J., 3(2): 148-161.

ImKS, Pesaran MH, Shin Y (2003). Testing for Unit Roots in Heterogeneous Panels, J. Econ., 115: 53-74.

Katafono R, Gounder A (2004). Modelling Tourism Demand in Fiji, Reserve Bank of Fiji Working Paper 2004/01, Suva: Reserve Bank of Fiji.

Law R, Cheung C, Lo A (2004). The relevance of profiling travel activities for improving destination marketing strategies, Int. J. Contemporary Hosp. Manage., 16(6): 355-362.

Lee C, Chang C (2008). Tourism Development and Economic Growth: A Closer Look at Panels, Tour. Manage., 29: 180-192.

Levin A, Lin CF, Chu C (2002). Unit Roots Tests in Panel Data: Asymptotic and Finite Sample Properties. J. Econ., 108: 1-24.

Li G, Wong KKF, Song H, Witt SF (2006). Tourism demand forecasting: A time varying parameter error correction model. J. Travel Res., 45: 175-185.

Lim C (1997). Review of International Tourism Demand Models. Ann. Tour. Res., 24(4): 835-849.

Luzzi G, Flückiger Y (2003). An Econometric Estimation of the Demand for Tourism: The Case of Switzerland. Pacific Econ. Rev., 8(3): 289-303.

Martinez-Zarzoso I, Nowak-Lehmann F (2003). Augmented Gravity Model: An Empirical Application to Mercosur-European Union Trade Flows. J. Appl. Econ., 6(2): 291-316.

Middleton VTC, Clarke J (2001). Marketing in Travel and Tourism, 3rd edn.,. Butterworth-Heinemann: Oxford.

Narayan PK (2005). The Structure of Tourist Expenditure in Fiji:

Naudé WA, Saayman A (2004). The Determinants of Tourist Arrivals in Africa: A Panel Data Regression Analysis, Paper Presented at the International Conference, Centre for the Study of African Economies, St. Catherine's College, University of Oxford, March. Pp.21-22

Naudé WA, Saayman A (2005). 'Determinants of Tourist Arrivals in Africa: A Panel Data Regression Analysis. Tour. Econ., 11(3): 365-391.

Njobeni S (2006). Weaker rand aids tourism – Investec. Business Day, 16 October, p 2.

Oyewole P (2004). International tourism marketing in Africa: An assessment of price competitiveness using the purchasing power parities of the ICP. J. Travel Tour. Mark.,16(1): 3-17.

Palhares GL (2003). The role of transport in tourism development: nodal functions and management practices. Tour. Manage., 5(5): 403-407.

Pearce D (1999). Introduction: Issues and Approaches. In Pearce, D and Butler, R. (Eds), Contemporary issues in tourism development, London: Routledge.

Presidency Republic of South Africa (2006). Accelerated and Shared Growth Initiative – South Africa (ASGISA), Pretoria: Presidency Republic of South Africa.

Rosselló J, Aguiló E, Riera A (2005). Modeling Tourism Demand Dynamics, J. Travel Res., 44: 111-116.

Sinclair MT (1998). Tourism and Economic Development: A Survey, The Jnl of Dev. Stud., 34(5): 1-51.

South African Tourism (2005). Annual Report, Johannesburg: South African Tourism, [On line] Available from: http://www.southafrica.net/satourism/research/research.cfm.[Downloaded: 2008-02-17]

South African Tourism (2007). Annual Report, Johannesburg: South African Tourism, [On line] Available from: http://www.southafrica.net/satourism/research/research.cfm.[Downloaded: 2008-02-17]

South African Tourism (2008). Gearing up to be Globally Competitive: Tourism Growth Strategy, 2008-2010, Johannesburg: South African Tourism, Available from: http://www2.southafrica.net/satourism/research/viewResearchDetail.cfm?ReportTypeCategoryID=36. [Downloaded: 2009-04-23]

Strauss J, Yigit T (2003). Shortfalls of Panel Unit Root Testing', Econ. Lett., 81: 309-313.

The Herald (2005). 'Fuel price a challenge to tourism industry', The Herald, 7 September, p 4.

The Herald (2007). Infrastructure key to maximizing growth, The Herald, 7 November, p 13.

Walsh M (1997). Demand Analysis in Irish Tourism, Jnl of the Statistical and Social Inquiry Society of Ireland, 27(4): 1-35.

Webber AG (2001). Exchange rate volatility and cointegration in tourism demand, J. Travel Res., 39: 398-405.

World Travel and Tourism Council (2006). Progress and Priorities 2006/2007, London: World Travel and Tourism Council.

Table A1. Panel unit root test.

Variable	IPS test statistic	LLC test statistic
Rand/Euro exchange rate	0.505 (0.693)	-5.601 (0.000)***
Tourist arrivals	-1.601 (0.054)*	-14.985 (0.000)***
South Africa Consumer Price Index	-3.251 (0.000)***	-13.424 (0.000)***
Electricity generated in South Africa (South African infrastructure)	-4.492 (0.000)***	40.834 (0.000)***
Infrastructure in trading partner (number of aircraft departure in tourism source country)	-3.668 (0.000)***	37.401 (0.000)***

***, **, * Significant 1, 5 and 10% levels; probabilities are in parentheses.

Table A2. Countries used in the estimation and their fixed effects.

Country	Effect
Angola	-0.502017
Australia	-0.717989
Austria	-1.644914
Belgium	-1.039898
Botswana	2.697173
Canada	-1.510363
China	-1.805133
France	-0.545140
Germany	0.238726
India	-1.296652
Ireland	-1.309653
Italy	-1.213748
Japan	-1.985687
Lesotho	4.220407
Malawi	0.919013
Mozambique	2.596028
Namibia	1.622892
Netherlands	-0.176389
Portugal	-1.287162
Spain	-1.847916
Swaziland	3.235408
Sweden	-1.411606
Switzerland	-1.173014
United Kingdom	0.839700
USA	-0.416971
Zambia	0.994025
Zimbabwe	2.520881

APPENDIX

Data sources

The estimation uses annual data and covers the period 1999 to 2007 for 27 countries. The number of tourist arrivals in South Africa is the dependent variable. GDP for the tourism source country represents income (World Bank's Development Indicators and various issues of IMF's International Financial Statistics). The Rand/Euro exchange rate data (IMF's International Financial Statistics). South African Consumer Price Index (South African Reserve Bank). The number of aircraft departing from the tourist source countries (World Bank Development Indicators) while electricity produced/ generated in Gigawatt–hours in South Africa (Statistics South Africa). Distance in kilometres between capital cities (http://www.timeanddate.com.).