Exchange Rate Exposure: Does exchange rate movement influence tourism development?

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Abstract

This paper examines the impact of exchange rate exposure on tourism demand using a dynamic panel of 23 sub Saharan Africa's tourist destinations. Although, the research question for the paper focuses on whether uncertainty on the exchange rate can help explain why could exchange rate fluctuation co-move with the travel expenditure using data from these selected African tourist destinations as well as the variations across countries in recent years. Utilising annual data from 1996 to 2015 on dynamic panel estimation techniques, we provide evidence which suggests that both variables exchange rate fluctuation and travel expenditure are statistically significant determinants of tourism demand. The Penal autoregressive distributed lagged ARDL panel cointegration test is utilised to examine the existence of a long run association between exchange rate and travel expenditure and the findings from the panel cointegration test reveals that real income, real exchange rates, price inflation and travel expenditure and international tourist arrival have long run relationship. We also employed pool (OLS), fixed effect (FE) and random effect (RE) models to investigate which of the models in questions can at most have useful information to explain tourism demand subject to travel expenditure with respect to the selected sampled tourist destinations in Africa.

Keywords: exchange rate movement, exchange rate risk and panel ARDL

1. Introduction

Exchange rate exposure on travel expenditure can be view from the dynamics behaviour of exchange rate as it can be seen from a rational viewpoint. A tourist converts its travel expenditure from the domicile currency to home currency by translating them at expected future exchange rates. However, the gap between expected future exchange rate and actual rate emanating from exchange rate movement is term as exchange rate risk(Mordi, 2006).

According to Lee and Jang (2011) exchange rate risk has waged attention to multinationals in trade related industries with bilateral exchange rate having dominated by floating regimes while, tourism is also sensitive to the exchange rate between travellers' home countries and their destinations. Although, the exposure for travels and tours firms to foreign exchange risk results from in the domestic price elasticity of demand.

There are strands of literature that attempted to examine the impact of exchange rate on international tourism. Although, firms produce goods for exhibitions that have marketable characteristics which have no boundary and, goods for tourism are mainly export driven but when purchased by international travellers to the level that the producers engage in multilateral trade. This engagement in a way of market led relationships between the firm-produces and the purchase power of both regional and international travellers exposed the domestic firms from uncertainty of demand fluctuations incurred by exchange rate changes(Agiomirgianakis et al., 2012; Cheng, 2012; Cheng et al., 2013; De Vita & Kyaw, 2013; Dincer et al., 2015; Kodongo & Ojah, 2013; Quintal et al., 2010).

Therefore, the objective of this paper is to investigate the impact of exchange rate exposure on travel expenditure using dynamic panel data from 23 countries from African sub-region as tourist destinations in Africa.

2. Literature Review

Although there has been some difference among selected variables determining exchange rates our investigation has uncovered a set of commonly utilized determinant variables. These variables are: a) the real effective exchange rate; b) the relative prices between destination and origin and c) the income, approximated by the GDP in PPS of set or major countries of tourist's origin. Empirical studies that investigate the impact of tourism have found that the devaluation of exchange rate at the country of destination attracts tourist flows while an exchange rate revaluation reduces tourism outflows (see e.g. among others Agiomirgianakis (2012); Garin-Munoz and Amaral (2000)and (Patsouratis* et al., 2005) adopting what Artus (1970)has suggested, namely, that travellers are more aware of exchange rates that they use, and they are using them as proxy for the cost of living abroad. Researchers often suggest that the origin country income affects positively the inclination of people to travel. The cost of living at a destination relative to an origin, given by relative consumer prices between destination and origin is negatively related to tourism inflows (see, among others, Dwyer et al.2010 page 63-64). Transportation costs which is actually part of the overall cost of traveling to a destination, is negatively related in tourist flows see e.g. Agiomirgianakis (2012) and Santana-Gallego et al. (2010).

Some researchers have shed, some light into the effect of exchange rate volatility to tourist flows for example Patsouratis (2005) who shows that exchange rate fluctuations may be identified as the sole factor determining tourist flows, as the case of German tourism inflows in Greece. Fewer, however studies focus rather on the exchange rate volatility such as Webber (2001), Mak et al. (2012), Yap (2012), Fourie and Santana-Gallego (2011)

In a seminal paper by Webber (2001), the volatility of exchange rate is identified as a significant determinant of the long run tourism demand since in some cases exchange rate volatility might also be associated with political instability or social unrest in the destination country deterring tourists from this destination. In some cases, according to Webber exchanger rate volatility may lead tourists to abandon the idea of travelling to a particular country in 40% of cases(Song & Li, 2008; Su & Lin, 2014).

Recent studies such as Chiang et al (2009) initiated a further analysis into the effects of volatility of exchange rates showing that it is associated with the volatility into international tourist inflows in Taiwan. Yap (2012), initiated by the findings of Chiang et al (2009) in investigating whether exchange rate volatility results an increase in the uncertainty of tourist inflows into Australia, concludes that exchange rate volatility creates spill over effects on tourism arrivals in Australia though these effects may differ from stronger to weaker depending upon the sending country that creates these tourism inflows into Australia.

3. Data and Research Methodology

The study attempts to identify major factor influencing international tourism demand for selected tourism destinations in Africa, based on dynamic panel time series data analysis of travel expenditure and exchange rate fluctuation in these countries. The sample period for the analysis spans from 1996 to 2015. The data were obtained from world bank series and IMF 2017.

Real GDPC is use as a measure of income[RGDPC] per capita, real effective exchange rate is used to measure exchange rate exposure [RER], and consumer price[CPI] is used to measure relative price, as sourced world economic outlook 2017, while tourist expenditure is used to measure travel expenditure[TE] and Number of tourist arrivals to the destinations is used to measure tourism demand [TARD]. The following model is used to estimate exchange rate exposure and travel expenditure.

3.1 Empirical model and Econometric Methodology

Following we specify the econometric models between travel expenditure and real exchange rate movement in the selected African countries. Although, we begin with the examinations of the statistical properties of the data to avoid running into spurious regression problem. We need to verify that all the series are integrated to the same order via first generation tests of panel unit roots; Im et al. (2003), Maddala and Wu (1999) and Levin and Lin (1993). The tests proposed by IPS permit to solve Levin and Lin's serial correlation problem by assuming heterogeneity between units in a dynamic panel framework. Notwithstanding, the following task remain to examine the long run relationship between the variables. The paper adopts Pesaran et al (1999) methodology which suggests two different estimators i.e. Pool Mean Group (PMG) and Mean Group (MG) estimators appropriate for investigation of panel with large time series and cross session dimensions. The advantage of PMG over others is that it can allow the short run dynamic specification to differ from country to country while the long run coefficient is assumed to be the same. The Autoregressive Distributed Lag $(p,q,q,....,q)$ model proposed by Pesaran et al. (1999) is

$$\ln TE_{i,t} = c + \phi_i \ln TE_{i,t-1} + \beta_{i1} \ln RGDPC_{i,t} + \beta_{i2} \ln RER_{i,t} + \beta_{i3} \ln CPI_{i,t} + \beta_{i4} \ln TARD_{i,t} + \varepsilon_{i,t} .....(1)$$

Where TE is travel expenditure, $RGDPC$ is the real GDP per capita, RER is real exchange rate, CPI is the consumer price inflation and $TARD$ is the international number of tourist arrivals. A lagged dependent variable is included to allow for the partial adjustment of TE to its long run equilibrium value and beta coefficients represent short run effects: long run effect can be derived by dividing each of the betas by $1-\phi_1-\phi_2$.

In order to examine the hypothesis that there is no long run association between travel expenditure and other variables, we proposed joint test between travel expenditure TE and all the other variables using the χ^2 test statistics. If $\beta_2, \beta_3 and \beta_4$ are positive and jointly significance, this implies that the combination of real exchange rate, consumer price and international tourist arrival exerts an influence on travel expenditure. In other hand, if $\beta_1, \beta_2 and \beta_3$ are positively significant this implied that a combination of real GDP per capita in the equation jointly exerts an influence on travel expenditure. Hence a loose version of hypothesis holds revealing that a small increase in either of the variables would then results in lesser or greater or both jointly determine the travel expenditure. A stricter version of the testing the hypothesis simultaneously requires the interaction between real income per capital, real exchange rate, consumer price and tourist arrival where the interaction term is entered jointly in the regression, as follows;

$$\ln TE_{i,t} = c + \phi_i \ln TE_{i,t-1} + \beta_{i1} \ln RGDPC_{i,t} + \beta_2 \ln RER_{i,t} + \beta_3 \ln CPI_{i,t} + \beta_4 \ln TAR$$
$$+ \beta_5 (\ln RGDPC_{i,t} \times \ln RER_{i,t} \times \ln CPI_{i,t} \times \ln TARD_{i,t}) + \varepsilon_{i,t} .....(2)$$

If β_5 is statistically significant this means that travel expenditure is enhanced when countries real income, real exchange rate and consumer price are at minimum threshold window to sufficiently allow for that propensity of the income sent on tourism development. Equation (1) and (2) provide the basis of testing the first hypothesis in the empirical model which will be estimated using the panel ARDL framework.

Following Yap (2013) this paper also used an augmented version of his model amplified with travel expenditure to examined the second hypothesis in the model as thus;

$$\ln TE_{it} = \alpha + \beta_1 \ln RGDPC_{it} + \beta_2 \ln RER_{it} + \beta_3 \ln CPI_{it} + \beta_4 \ln TARD_{it} + \lambda_i + \mu_{it} \ldots\ldots\ldots\ldots\ldots(3)$$

Where $\varepsilon_{it} = \lambda_i + \mu_{i,t}$ cross-sectional units are denoted by $i = 1, 2, \ldots N$; $t = 1, 2, \ldots T$ represent time periods, μ_i represents the fixed effect, λ_{ij} represents the coefficient of the lagged dependent variables, and δ_{ij} are $k \times 1$ coefficient vectors.

4. Data Analysis and Result Discussion

The results from the Panel ARDL model of 23 African countries, the lag lengths n as chosen from a maximum of four by minimizing the Akaike Information Criterion (AIC) for each individual estimation.

Hypothesis one Ho1: There is no long run association between travel expenditure and other variables.

Table 1: Results of PMG and MG estimation 1995-2015

Variables	(1) ECM	PMG Model (2) SR	(3) ECM	MG Model (4) SR
ECM		7.55e-09***		7.21e-09***
		(2.02e-09)		(1.87e-09)
lnRGDP		-0.0156		-0.265
		(0.0257)		(0.225)
lnCPI		-0.0232		-0.0205
		(0.0523)		(0.0630)
lnRER		0.0401		1.097***
		(0.128)		(0.382)
lnTARD		0.0685		0.119
		(0.0887)		(0.0788)
lnRGDP	164,377		-1.527e+06	
	(340,556)		(1.693e+07)	
lnRER	27,903***		1.281e+08*	
	(7,702)		(7.438e+07)	
CPI	641,804***		-1.065e+07	
	(135,095)		(1.065e+07)	
Constant		17.48***		13.45***
		(1.193)		(1.931)
Observations	388	388	388	388

Standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

We then estimate each model separately also long run results can vary from each as we observed from the regression estimates some error correction term appeared negatively significant as in the first set; Egypt (-0.164) 16.4&% and Tanzania (-0.059) 5.9%, negatively insignificant; Burundi (-0.009), Kenya (-0.024), Lesotho (-0.0086), Malawi (-0.002), Mozambique (-0.007), Swaziland (-0.010) and, Nigeria (-0.008) as the second set of countries. Finally, the positively significant and positively insignificance as the third set are; Angola (0.047), Botswana (0.095), Congo DR (.035**), Ethiopia (0.427***), Gambia (0.028), Ghana (0.005), Morocco (0.072), Rwanda (0.115), South Africa (0.321***), Sudan (0.0757***), Togo (0.001), Tunisia (0.695***), Uganda (0.077) and Zambia (0.011).

We consider a set of variables to be significant if the corresponding F-statistic in the joint significance test is above "upper bound" critical value. If the F-statistic for a specific estimation lies below this value, we test for a significant relationship among the variables by forming a single "fitted value" of the lagged long-run variables using the estimates and replacing the individual terms with a single error-correction term (labelled ECM_{t-1}). If the coefficient on this variable is significantly negative as theory suggests, the error term measure the speed of adjustment following exogenous shocks.

Hypothesis two Ho1: Exchange rate fluctuations do not have any effect on travel expenditure.

Table 2: Results of Pool OLS, Fixed Effect and Random Effect Models

Dependent variable lnTE			
	Pool OLS Model (1)	Fixed Effect Model (2)	Random Effect Model (3)
Regressors	ITE	ITE	ITE
lnRGDP	0.158**	-0.00672	-0.00172
	(0.0778)	(0.0465)	(0.0462)
lnRER	0.0577**	-0.0300	-0.00120
	(0.0234)	(0.0554)	(0.0445)
lnCPI	0.239***	0.0528	0.0647
	(0.0563)	(0.0419)	(0.0410)
lnTARD	0.887***	0.860***	0.842***
	(0.0400)	(0.0581)	(0.0506)
Constant	6.452***	7.726***	7.833***
	(0.629)	(0.719)	(0.684)
Breusch-Pagan	-	-	1552.18
LM test			[0.000]
Hausman test	-	-	2.51
			[0.6437]
Observations	388	388	388
R-squared	0.582	0.462	
Number of code		23	23
Multicollinearity(vif)	1.14	-	-
Heteroskedasticity	-	2652.73	-
		[0.000]	
Serial Correlation	77.481	-	-
Wooldridge test	[0.000]		

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 2 above we show the result of the impact of exchange rate exposure on travel expenditure and tourism demand. Three different panel data models were estimated, and they include the Pooled OLS, Fixed effect and Random Effect Models. In the Pooled OLS estimation, the Wooldridge test for serial correlation test. It is imperative that we process to estimate the other variation on the panel data models. Similarly, the result from multicollinearity revealed that the mean vif 1.14 which means less collinearity, shows that the data are consistent with the advantage of using panel data. The Wald test statistics value of 2652.73 which are significance

at 1% confirmed evidence of omitted variables making the fixed effect and random effect models more appropriate than the pool OLS. A Lagrange-Multiplier test for serial correlation value of 77.481 and significant, we reject the null and conclude that the data have first order autocorrelation. However, the Hausman test statistics value of 2.51 is also significant, hence we reject the null hypothesis of the appropriateness of GLS estimates favouring fixed effect model as the most appropriate. A cursory look at the results (pool OLS estimation) indicates that real exchange rate had positive and significant with the travel expenditure, followed by the remaining variables, and is not surprised with the tourism arrival series and the priori expectations.

5. Conclusion and Policy Recommendation

The objective of this study is to investigate the effect of exchange rate exposure on travel expenditure from the concept of tourism demand in selected tourist destinations in Africa. The result shows that the international tourism demand in Africa sub region is significantly influenced by the changings in real exchange rate, income and relative price of tourism. The policy makers may consider increasing the level of investments in tourism sub sector of their economies to leverage on this unfolding information and gain more income which will provide better financial source to their countries.

In this study the effect of exchange rate movement has been examined to have potential effects to tourist expenditure, an effect which is often overlooked by empirical researchers. As researchers for the most part utilized international arrival as the pivot for tourism demand, our empirical investigations consisted of tourist arrival subject to the travel expenditures. The employability of these measures allowed us to investigate unexpected impact to tourism arrivals for selected countries. Our empirical methodology relies upon the pooled mean group(PMG)ARDL representation of the cointegrated variables. Over all our results suggest that there is a statistically significant long run relationship among variable in the models.

Overall results have one important implication. This is that exchange rate movement is a contributing factor to tourist arrivals. Both the panel ARDL cointegration representations and the pooled mean group(PMG) have proven to have a significant effect to tourist arrivals. As a result, researchers but most importantly policy makers should pay close attention to exchange rates when implementing policy designed to stimulate tourism. As different aspects of the exchange rate might affect tourism in different ways empirical researchers should utilize new measures which will allow them to isolate and examine additional effects of exchange rate to tourism.

Appendix1

Appendix 1: Panel unit root

Series	LTE		LRGDP		LCPI		LRER		LTARD	
	No Trend	Trend	No Trend	Trend	No Trend	Trend	No Trend	Trend	No Trend	Trend
	Level									
Levin Lin	1.9957 (0.0230)	0.4766 (0.3168)	-2.39988 (0.0082) **	-1.27381 (0.1014)	-2.23662 (0.0127)	-3.21180 (0.0007) **	4.71097 (0.0000) ***	-4.30841 (0.0000) ***	-2.63095 (0.0043)	-0.94852 (0.1714)
IPS	1.52747 (0.9367)	0.09093 (0.5362)	-2.68216 (0.0037) **	-1.01827 (0.1543)	-3.23446 (0.0006)	-2.46802 (0.0068) **	-0.64800 (0.2585)	-2.10701 (0.0176)	1.47826 (0.9303)	0.99532 (0.8402)
ADF-Fisher	1.65707 (0.9512)	0.08459 (0.5337)	-2.87681 (0.0020)	-1.10895 (0.1337)	-3.23099 (0.0006) ***	-2.59801 (0.0047) **	-0.59122 (0.2772)	-2.38121 (0.0086) **	1.53536 (0.9377)	1.35535 (0.9123)
	First Difference									
Levin Lin	6.22606 (0.0000) ***	5.91517 (0.0000) ***	-13.4740 (0.0000) ***	-11.9762 (0.0000) ***	-10.6855 (0.0000) ***	-10.1720 (0.0000) ***	-5.54911 (0.0000) ***	-4.20470 (0.0000) ***	-6.74306 (0.0000) ***	-5.31118 (0.0000) ***
IPS	7.23767 (0.0000) ***	5.17240 (0.0000) ***	-14.0789 (0.0000) ***	-10.1544 (0.0000) ***	-11.7324 (0.0000) ***	-8.89694 (0.0000) ***	-4.65764 (0.0000) ***	-2.01410 (0.0220) **	-6.76896 (0.0000) ***	-4.75011 (0.0000) ***
ADF-Fisher	-7.33404 (0.0000) ***	-5.56093 (0.0000) ***	-11.7387 (0.0000) ***	-9.71057 (0.0000) ***	-10.8981 (0.0000) ***	-8.56051 (0.0000) ***	-5.05223 (0.0000) ***	-2.41137 (0.0079) ***	-7.01053 (0.0000) ***	-5.76105 (0.0000) ***

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