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International Tourism and Economic Growth in Zimbabwe: An ARDL - Bounds Testing Approach

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Authors' contributions

This work was carried out in collaboration among all authors. Author TN designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors TN and NM managed the analyses of the study. Author JT managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

This study investigated the effect of international tourism development on economic growth in Zimbabwe, using time series data spanning over the period 1980 to 2017. The main aim of the study was to examine whether international tourism is a pathway to economic recovery in Zimbabwe. The study adopted the tourism growth model proposed by Balaguer and Cantavella-Jorda [1] and applied the Autoregressive Distributed Lag (ARDL) bounds testing approach and its associated Error Correction Model (ECM). The direction of causality between international tourism and economic growth was examined using the Granger causality test in an error correction framework. The findings of the study show that the Tourism-led Growth Hypothesis (TLGH) is valid both in the short-run and long-run while the Economic-Driven Tourism Growth Hypothesis (EDTGH) is valid in the long-run only. This implies that the resource allocation strategy for the Government of Zimbabwe should prioritize both international tourism and economic expansion. The study, therefore, recommends that the Government of Zimbabwe should allocate resources towards

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supporting the tourism sector to stimulate economic growth in the country. On the other hand, the study, guided by the validity of the EDTGH in the long run, suggests that the Government of Zimbabwe should also consider allocating resources to other sectors currently driving the economy, for example, the agriculture and manufacturing sectors; as this will stimulate economic expansion in the long run.

Keywords: International trade; macro economy; economic growth; Zimbabwe; ARDL; tourism.

1. INTRODUCTION

International tourism is steadily growing as a strong pillar of sustainable economic growth and development in the world [2] and apparently offers the potential for growth rates far in excess of what can be achieved by domestic tourism and obviously deserves priority attention [3]. Zimbabwe is, in fact, banking on tourism growth [4], specifically, international tourism [5] to resuscitate the economy. The country is not yet ready to rely on domestic tourism because most of its citizens are low-income earners that cannot economically support tourism in Zimbabwe [6,7,8,5]. International tourism is therefore an important contributor of foreign exchange in Zimbabwe, hence, the country is working towards eliminating the obstacles that limit the flow of international tourists, for example, inefficient visa and border crossing processes as well as political instability and security threats (World Economic Forum [9].

1.1 Statement of the Problem

Zimbabwe's economy, once one of the strongest in Africa at independence in 1980 [10], has one of the lowest GDP per capita in the world [11] and is characterized by a sluggish growth of approximately 4% per annum [12], which is quite below the sustainable growth rate of more than 5% per annum [13]. The country is also deeply entrenched in foreign exchange shortages [14], projected to persist into the future [15]. On this trajectory, Zimbabwe's goal of reaching upper-middle-income status by 2030 may be compromised (Welborn et al., 2019). International tourism, however, if given the attention it deserves can drive the economy on an upward trajectory. The sector contributed approximately 7.2%, 5.2%, and 4.7% to GDP, employment and export earnings in 2018, respectively [14]. According to RBZ [16] the tourism industry surpasses agriculture and manufacturing industries in terms of the country's fastest turn around industries. The lack of an evidence-driven tourism policy can be an impediment to the attainment of the needed growth in the country and has contributed to misuse and neglect of abundant tourism resource endowments (especially, the flora and fauna) in the country [9], (Eyuboglu & Eyuboglu, 2020). In Zimbabwe, very few studies examined the contribution of tourism particularly, international tourism to economic growth, despite its overall role in foreign exchange generation. The few studies available, Makochekanwa [17] and Nene and Taivan [18], analyzed the tourism – growth nexus for the SADC and SSA, respectively, where Zimbabwe was included as a panel country. Hence, this study seeks to contribute further to the tourism-economic growth led hypothesis and provide empirically-based evidence for policy making in the tourism sector. This study constitutes the first country-specific study in the case of Zimbabwe and is thereby poised to unveil feasible policy directions in order to take Zimbabwe to a better level in terms of economic growth.

1.2 Research Objectives

The objective of this study is to examine whether international tourism is a pathway to economic recovery in Zimbabwe.

2. LITERATURE REVIEW

2.1 Tourism – Economic Growth Nexus Hypothesis

The debate on the impact of international tourism on economic growth is inconclusive and is characterized by two main opposing views: the Tourism-Led Growth Hypothesis (TLGH) [1] and the Economic-Driven Tourism Growth Hypothesis (EDTGH) [19], among other views such as the Reciprocal Hypothesis (RH) [20] and the No Relationship Hypothesis (NRH) [19,21]. The TLGH, formally referred to as the "tourism-growth model" by Balaguer & Cantavella-Jorda [1] argues that international tourism is the main driving force of overall long-term economic growth and suggests a one-way causal relationship running from international tourism development to economic growth. If the TLGH is valid for a certain country, then promoting

international tourism would stimulate economic growth. The EDTGH, also known as the Conservation Hypothesis (Antonakakis et al., 2013); [22,23], (Zhang & Cheng, 2019; Eyuboglu & Eyuboglu, 2020), or Reverse Causality [19,24], (Suryandaru, 2020) or Supply-side Tourism (Jackman, 2012); [25] is in fact, a reverse causation of the TLGH and suggests a unidirectional causal relationship running from economic growth to international tourism. If the EDTGH is valid for a particular country, then economic expansion in that country would enhance tourism revenues.

Two other different views add on to the debate, namely, Dritsakis [20]'s RH, and the NRH of Oh [19] and Katircioglu [21]. The RH is also known as the bi-directional or feedback causality (Eyuboglu & Eyuboglu, 2020), asserting causality runs in both directions, that is, from international tourism to economic growth and vice-versa [26]. If the RH is valid, then the resource allocation strategy should emphasize both tourism and other leading industries in the economy [27], (Eyuboglu & Eyuboglu, 2020). The NRH is also known as the Neutrality Hypothesis and basically postulates that in rare circumstances, international tourism and economic growth may exhibit no relationship (Antonakakis et al., 2013); [22]. If the NRH is valid, then tourism improvement strategies by tourism managers and decision-makers may not be effective. Overall, when governments and policy makers formulate policies and strategies, these must be based on the empirical confirmation of any of the four hypotheses.

2.2 Standard Economic Growth Theories

The endogenous growth theory [28,29,30], generally views economic growth as an endogenous outcome of an economic system and not the result of forces that input it from the outside. The theory emphasizes on technology, human capital, physical capital, and labor as the main factors affecting economic growth [31]. The unique feature of this theory is that it links technical progress directly to productivity and economic growth, rather than to labor and capital. Technology is a central component of endogenous growth, especially when it comes to its innovation function that allows an economy to produce new and better products (Broda et al, 2006), with human capital usually seen as its complementary engine of growth [29,31]. However, the endogenous growth theory gives a benefit of the doubt to tourism through the TLGH in the sense that international tourism can be included as an input in the production function [32], (Gokovali & Bahar, 2006; Parrila, 2007); [33,17,18] to help countries increase their economic growth. In fact, Seetanah [33] highlighted that if technological progress is higher in the manufacturing sector than in the tourism sector, tourism specialization becomes growth enhancing if, and only if, the change in the terms of trade between tourism and manufacturing goods more than balances the technological gap of the tourism sector. The Solow model [34], in its original form, does not talk about tourism; it rather identifies labor, capital and technological advances as the main determinants of growth. However, it was later extended to include other factors such as population growth, savings as well as tourism amongst others [35,36,37]. Within the modified Solow model, which supports the TLGH, international tourism is included as an additional input in the neoclassical aggregate production function while labor, capital and technology are the main factors affecting economic growth (Du et al., 2016; Matahir & Tang, 2017). Both standard growth theory and the four hypotheses are not explicit as to how tourism can affect economic growth. Interestingly, standard growth theory has, to some extent, provided room for tourism-led growth; for example, the extended Solow growth model and the modified endogenous growth model.

2.3 Empirical Literature Review

One interesting characteristic of the reviewed empirical literature is that, although there are mixed results around the globe; the validity of the TLGH scoops the lion's share in both single country analysis and analysis of panels of countries. This indeed, supports the hypotheses of this study that international tourism is now the new engine of growth across the globe and its development cannot be undermined if economic growth is anything to go by. The empirical literature review also clearly indicates that no similar country-specific study has been done in Zimbabwe, hence the need to fill this gap.

3. RESEARCH METHODOLOGY

3.1 Theoretical Model

This study follows the leads of the TLGH and the intuition of the tourism growth model as postulated by Balaguer & Cantavella-Jorda [1], based on the assumption that international tourism is an important determinant of economic growth. The TLGH basically postulates that

international tourism is a major determinant of economic growth and thus economic growth is a function of international tourism. This gives us the equation:

$$Y = f(TA) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots [1]$$

Where Y is total output in the economy and TA is international tourist arrivals. According to Zhang & Cheng (2019), the TLGH is mostly used to analyze the effect of international tourism based on the country or region level. In this paper, the TLGH is used to investigate the effect of international tourism on economic growth on a country level. Region level studies such as Caglayan et al. [40], Alhowaish [24] and Wu & Wu [42] are usually questionable because their results are generalized over regions with different economic characteristics. In the case of Zimbabwe, Makochekanwa [17] and Nene & Taivan [18] suffer from the same phenomenon.

3.2 Empirical Model

Due to its popularity and overwhelming empirical applicability, the model by Balaguer & Cantavella-Jorda [1] has also been used in a number of well recognized scholarly papers, for example, Dritsakis [20], Gunduz & Hatemi [39], Lee & Chang [43], Katircioglu [21,44], Belloumi [45], and Dritsakis [46]. To reveal the effect of international tourism on economic growth in Zimbabwe, this study follows the model by Balaguer & Cantavella-Jorda [1] and modifies it to:

$$LY_t = \alpha_0 + \alpha_1 t + \alpha_2 LTA_t + \alpha_3 LQ_t + \mu_t \dots\dots [2]$$

Table 1. Empirical literature review

Author/Year	Country	Method	Study Period	Key Results
Balaguer & Cantavella-Jorda [1]	Spain	VECM	1975-1997	TLGH valid in the long run
Durbarry [38]	Mauritius	VECM	1952-1999	TLGH valid in the long run
Gunduz & Hatemi [39]	Turkey	VAR	1963-2002	Supports long run validity of the TLGH
Caglayan et al. [40]	America, Europe, Asia, Africa (135 countries)	3-stage panel Granger causality analysis	1995 - 2008	EDTGH valid in America and Caribbean countries; TLGH valid in South Africa, East Asia and Oceania; NRH is valid in Middle East, North Africa, Central Asia and SSA
Makochekanwa [17]	SADC	Panel regression	2000 – 2012	TLGH valid in the long run
Alhowaish [24]	GCC countries	Panel VAR	1995 – 2012	TLGH holds true for Bahrain
Phiri [23]	South Africa	ARDL and NARDL	1995 – 2014	Linear framework supports both the EDTGH and the TLGH whereas the nonlinear framework supports the NRH in the long run
Akighir & Aaron [41]	Nigeria	ARDL	1980 – 2015	TLGH valid
Nene & Taivan [18]	SSA	Panel VECM	2000-2015	EDTGH valid for DRC, Kenya, SA and Uganda while TLGH is valid for Zimbabwe, Botswana, Malawi, Mali, Namibia and Tanzania
Wu & Wu [42]	11 Asian regions	Bootstrap Multivariate Panel Granger causality technique	1995 – 2015	EDTGH valid in Cambodia, China and Malaysia; TLGH valid in Hong Kong, Indonesia, Philippines and South Korea; RH valid in Macau and Singapore

Where Y_t is as defined in equation 1 and proxied by annual GDP, TA_t is as defined in equation 1, and Q_t is the nominal exchange rates variable, μ_t is the stochastic term, L is the natural log, α_0 is the constant term, α_1 is the coefficient associated with a linear trend (t) and α_2 and α_3 are coefficients associated with the logarithms of TA and Q, respectively. According to Chung et al. [47], if there are visible trends in the variables under consideration, then both the intercept and trend components ought to be specified. It is a priori expected that $\alpha_0 \ldots \alpha_2 > 0;\ \alpha_3 < 0$. Equation [2] is the estimable log linearized long-run relationship between international tourism and economic growth. Equation [2] is, in fact, the long-run equilibrium equation to be estimated as an unrestricted ARDL (p, w_1, w_2) model as shown in equation [6].

3.3 Cointegration Analysis: The Bounds Testing Approach

To investigate the existence of a long-run relationship between international tourism and economic growth portrayed by equation [2], the study employed the bounds testing approach developed by Pesaran & Shin [48] and Pesaran et al. [49] within the intuition of the ARDL model. After carrying out unit root tests, the study followed Pesaran & Shin [48] and Pesaran et al. [49] in transforming equation [2] into the ARDL (p, w_1, w_2) bounds testing model as follows:

$$\Delta LY_t = \alpha_{01} + \alpha_{11}t + \sum_{i=1}^{p} \alpha_{2i}\Delta LY_{t-i} + \sum_{i=0}^{w} \alpha_{3i}\Delta LTA_{t-i} + \sum_{i=0}^{w} \alpha_{4i}\Delta LQ_{t-i} + \beta_{11}LY_{t-1} + \beta_{21}LTA_{t-1} + \beta_{31}LQ_{t-1} + \mu_{1t} \quad \ldots\ldots\ldots [3]$$

$$\Delta LTA_t = \alpha_{02} + \alpha_{12}t + \sum_{i=1}^{p} \alpha_{2i}\Delta LTA_{t-i} + \sum_{i=0}^{w} \alpha_{3i}\Delta LY_{t-i} + \sum_{i=0}^{w} \alpha_{4i}\Delta LQ_{t-i} + \beta_{12}LY_{t-1} + \beta_{22}LTA_{t-1} + \beta_{32}LQ_{t-1} + \mu_{2t} \quad \ldots\ldots\ldots [4]$$

$$\Delta LQ_t = \alpha_{03} + \alpha_{13}t + \sum_{i=1}^{p} \alpha_{2i}\Delta LQ_{t-i} + \sum_{i=0}^{w} \alpha_{3i}\Delta LY_{t-i} + \sum_{i=0}^{w} \alpha_{4i}\Delta LTA_{t-i} + \beta_{13}LY_{t-1} + \beta_{23}LTA_{t-1} + \beta_{33}LQ_{t-1} + \mu_{3t} \quad \ldots\ldots\ldots [5]$$

Where Δ is the difference operator and p and w are lag orders. Equations [3] – [5] can be estimated using Ordinary Least Squares (OLS). The null hypothesis for non-cointegration was tested based on the F – statistic (from the Wald test). The bounds test, through the F-statistic [50], will be used to examine the joint significance of the coefficients on the one period lagged levels of the variables in equations [3 – 5]. The null hypothesis is specified as follows:

$$H_0: \beta_{2i} = \beta_{3i} = \beta_{4i} = 0;$$

against the alternative that the variables are cointegrated which is specified as follows:

$$H_1: \beta_{2i} \neq \beta_{3i} \neq \beta_{4i} \neq 0; \text{ for all equations.}$$

If the F – statistic is greater than the upper critical bound value, we reject the null hypothesis of non-cointegration and conclude that there is a long run relationship between the variables. If the F – statistic falls below the lower critical bound value, we fail to reject the null hypothesis of non-cointegration and conclude that there is no long run relationship between the variables. If the F – statistic falls between these critical bounds, Pesaran & Shin [48] and Pesaran et al. [49] aver that inference would be difficult and to proceed, in that case; information about the order of integration of variables will be needed. However, recent studies such as Kyophilavong et al. [51] and Rasasi & Banafea (2018) argue that if the F statistic falls between the lower bound and upper bounds, the results of the bounds test is inconclusive.

Critical bounds values can be obtained from either Pesaran et al. [49] or Narayan [50]. These critical values are quite different: Pesaran et al. [49] prepared the critical values using a large sample of 1000 observations and on the other side of the same coin Narayan [50] reproduced the critical values using small samples of 30 to 80 observations [52]. Narayan [50]'s critical values are better than Pesaran et al. [49]'s critical values due to the fact that the use of Pesaran et al. [49]'s critical values exposes the study to the risk of accepting the presence of cointegration when there is no cointegration. In fact, Narayan [50]'s critical values are 35.5% greater than Pesaran et al. [49]'s critical values and they are apparently specific for small samples like the one used in this study. Hence, this study will rely on critical values extracted from Narayan [50].

3.4 Long Run Output Elasticities

In order to obtain long run factor output elasticities, the study went on to estimate the long run relationship between international tourism and economic growth. To do this, equation [2] was specified in an unrestricted ARDL (p, w_1, w_2) model as follows:

$$LY_t = \alpha_0 + \alpha_1 t + \sum_{i=1}^{p} \alpha_{2i} LY_{t-i} + \sum_{i=0}^{w} \alpha_{3i} LTA_{t-i} + \sum_{i=0}^{w} \alpha_{4i} LQ_{t-i} + \mu_{it} \dots\dots\dots\dots [6]$$

3.5 The Error Correction Model: Granger Causality Test

The direction of causality between international tourism and economic growth will be analyzed using the Granger causality test in an error correction framework. Therefore, if the variables are cointegrated, the test for causality will be executed using an error correction construction arrived at from an ARDL (p, w_1, w_2) framework with the following specification:

$$\Delta LY_t = \alpha_0 + \alpha_1 t + \sum_{i=1}^{p} \alpha_{2i} \Delta LY_{t-i} + \sum_{i=0}^{w} \alpha_{3i} \Delta LTA_{t-i} + \sum_{i=0}^{w} \alpha_{4i} \Delta LQ_{t-i} + \emptyset_1 ECT_{t-1} + \varepsilon_{1t}. [7]$$

$$\Delta LTA_t = \alpha_0 + \alpha_1 t + \sum_{i=1}^{p} \alpha_{2i} \Delta LTA_{t-i} + \sum_{i=0}^{w} \alpha_{3i} \Delta LY_{t-i} + \sum_{i=0}^{w} \alpha_{4i} \Delta LQ_{t-i} + \emptyset_2 ECT_{t-1} + \varepsilon_{2t} \dots\dots\dots\dots\dots\dots\dots\dots\dots [8]$$

$$\Delta LQ_t = \alpha_0 + \alpha_1 t + \sum_{i=1}^{p} \alpha_{2i} \Delta LQ_{t-i} + \sum_{i=0}^{w} \alpha_{3i} \Delta LY_{t-i} + \sum_{i=0}^{w} \alpha_{4i} \Delta LTA_{t-i} + \emptyset_3 ECT_{t-1} + \varepsilon_{3t} \dots\dots\dots\dots\dots\dots\dots [9]$$

Where $\alpha_{2i}\ to\ \alpha_{4i}$ are short term dynamic coefficients and ECT_{t-1} is the lagged error correction term derived from the long run regression model specified as in equation [6].

The Engle-Granger (1987) cointegration approach is popular in literature (for example, [45,53,54,26,55] although it has an inferior statistical performance if compared to the error correction model applied in this study. In fact, the ECT_t employed in the error correction model under the Engle-Granger approach would be defined as:

$$ECT_t = \mu_t = LY_t - \alpha_0 - \alpha_1 t - \alpha_2 LTA_t - \alpha_3 LQ_t \dots\dots\dots\dots\dots\dots\dots [10]$$

and yet the one used in this study under the ARDL model is defined as:

$$ECT_t = \mu_t = LY_t - \alpha_0 - \alpha_1 t - \sum_{i=1}^{p} \alpha_{2i} LY_{t-i} - \sum_{i=0}^{w} \alpha_{3i} LTA_{t-i} - \sum_{i=0}^{w} \alpha_{4i} LQ_{t-i} \dots\dots\dots\dots\dots\dots [11]$$

According to Iqbal (2011) and Iqbal & Uddin (2013), the error correction model arrived at when using the ARDL model of Pesaran et al. [49] has a superior performance as compared to error correction models arrived at from Engle & Granger (1987) and Johansen (1991, 1998) approaches.

The lagged error correction term ECT_{t-1}, in equations [7] to [9] measures the speed of adjustment to the long run equilibrium. The sign of the error correction coefficient must be negative and statistically significant to ensure convergence of the dynamics to the long run equilibrium [56]. The value of the error correction coefficient, which signifies the speed of convergence to the equilibrium process, basically ranges between negative one and zero [57,56] (Enders, 2014). Negative one signifies perfect and instantaneous convergence while zero means no convergence after a shock in the process (Uddin et al., 2011). If the value of the coefficient of the lagged error correction term is between -1 and -2, the lagged error correction term produces dampened fluctuations about the equilibrium path. This means that, instead of monotonically converging to the equilibrium path directly, the error correction process fluctuates around the long-run value in a dampening manner [58]. A statistically significant error correction term indicates that all explanatory variables Granger cause the dependent variable in the long run.

Short-run Granger causality can be examined from equation [7] to [9] by a null hypothesis of non-causality specified as:

$$H_0: \alpha_{3i} = \alpha_{4i} = 0;$$

against the alternative that:

$$H_1: \alpha_{3i} \neq \alpha_{4i} \neq 0$$

The long-run causality has been examined by a null hypothesis of non-causality specified as:

$H_0: \emptyset_i = 0;$

against the alternative that:

$H_1: \emptyset_i \neq 0,$

where

$i = 1\ to\ 3.$

3.6 Measurements and Justification of Variables

3.6.1 Economic growth (Y)

Economic growth refers to a sustained increase in per capita national output or net national product over a period of time [59]. GDP can be proxied as the indicator of a country's economic growth, either in nominal [60] or real terms [42]. This study will use annual GDP measured in United States dollars at current prices, that is, GDP in nominal terms; as an indicator of Zimbabwe's economic growth. The relationship between economic growth and international tourism is ambiguous in the sense that economic growth can either affect international tourism positively through the EDTGH channel or exhibit no relationship with international tourism through the NRH lens. However, in this study, the expected sign of Y is positive in relation to TA.

3.6.2 International tourism (TA)

International tourism can be defined as tourism that crosses national borders (WTO, 2018). It occurs when people cross their national borders, traveling to and staying in foreign places for not more than one consecutive year for leisure, business and other purposes (*ibid*). The two most common variables for international tourism activity pointers are total number of international tourist arrivals [42] and international tourism receipts or earnings [61]. This study will use annual international tourist arrivals as a measure of international tourism. The nexus between international tourism is also ambiguous in the sense that TA can either affect Y positively through the TLGH channel or exhibit no relationship with Y through the NRH. However, in this study, the anticipated sign of TA is positive in relation to Y.

3.6.3 Exchange rate (Q)

The term "exchange rate" refers to the price of one currency in terms of another [62]. The exchange rate variable that is directly linked with tourism as well as economic growth should be a part of the model when analysing the causal relationships between tourism and economic growth [54]. In fact, exchange rates must be included in order to address the omitted variable problem as well as accounting for external competitiveness [1]. Exchange rates can be measured in real [1,45] or nominal terms [46,63,64]. In fact, Kogid et al. (2012) argues that both exchange rates, nominal and real; have similar causal effects on economic growth. Therefore, it does not matter whether the research uses real or nominal exchange rates. This study will apparently use annual official exchange rates, that is, exchange rates in nominal terms. The expected sign of Q is negative in relation to economic growth.

3.7 Data Issues

The data used in this study covers the period 1980 – 2017. Y_t and TA_t are collected from the World Bank (online database), Q_t was collected from both the Reserve Bank of Zimbabwe (RBZ) and the World Bank (online database). To enable comparability, all the data series were transformed (through natural logarithm transformation) into dimensionless measure prior to estimations; as guided by several previous studies such as Balaguer & Cantavella-Jorda [1], Belloumi [45], Samimi et al. [65] Dritsakis [46], Hye & Ali-Khan [54], Lean et al. [25], Tang & Tan [66] and Roudi et al. [61].

4. RESULTS AND DISCUSSION

4.1 Plots of the Time Series

Fig. 1 shows an overview of how nominal GDP, number of international tourist arrivals and nominal exchange rate variables trended over the period under study. The graph shows that international tourist arrivals and nominal GDP generally trended together over the study period. Nominal exchange rates generally trended together with both international tourist arrivals and nominal GDP from 1980 to 2002; after which the variable lost track and sharply followed an upwards trajectory until 2008. This could be attributed to the economic ills such as inflation and unemployment that faced the country during the so-called lost decade (Kanyenze et al., 2017), that is, the period, 1998 – 2008. In 2009, nominal exchange rates suddenly dropped and stabilized until 2017. This could be attributed to the rejection of the Zimbabwean dollar and the subsequent adoption of the United States Dollar (USD), which is largely celebrated for stabilizing the economy of Zimbabwe.

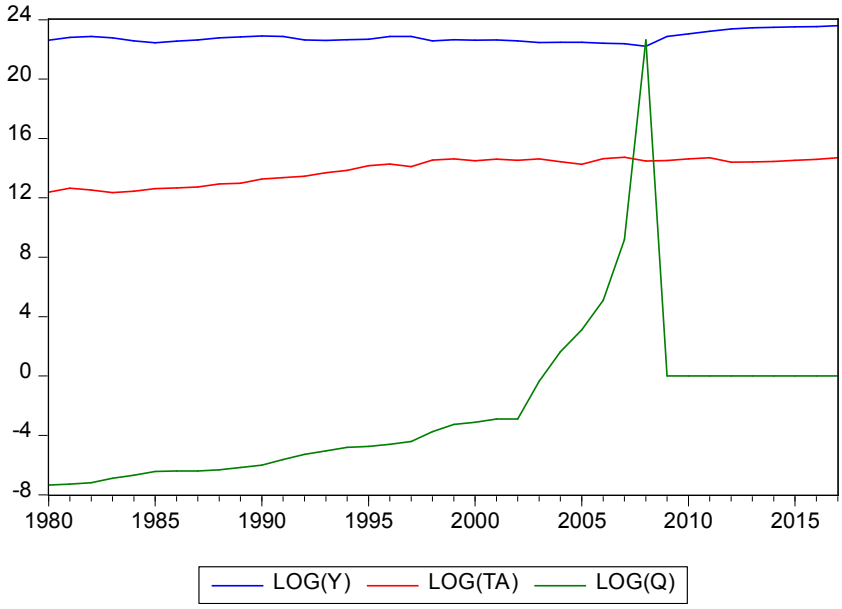

Fig. 1. Time series plots

4.2 Descriptive Statistics

The study employed annual time series data over the period 1980 to 2017 to examine the effect of international tourism on economic growth in Zimbabwe. As reported in Table 2 above, the descriptive statistics show a wide variation in the means across all the variables and this implies that any attempt to carry out regression estimates in levels will produce biased results.

The rule of thumb when it comes to analysing kurtosis for ascertaining normality is that it should typically be around 3. However, the results show that all the variables are not normally distributed but rather positively skewed, save for the international tourist arrivals variable whose kurtosis is 1.813669 and is negatively skewed. It is imperative to note that the nominal GDP variable, with a kurtosis statistic of 2.903258, is quite closer to being normally distributed and the skewness statistic affirms this (positive skewness); when compared to the nominal exchange rate variable.

The relatively smaller gaps between the maximum and minimum statistics of both international tourist arrivals and nominal GDP variables point to the non-existence of outliers in the data. However, the opposite is true for the nominal exchange rate variable: the wide gap between the maximum and the minimum indicates the existence of outliers in this variable. This is also indicated in the standard deviation statistic which is relatively higher for the nominal exchange rate variable, that is, 5.615739 as compared to 0.359142 for the nominal GDP variable and 0.843421 for the international tourist arrivals variable.

Table 2. Descriptive statistics

Descriptive statistic	LOG(Y)	LOG(TA)	LOG(Q)
Mean	22.80516	13.87977	-2.163592
Median	22.66919	14.34177	-3.501583
Maximum	23.60504	14.73707	22.62881
Minimum	22.20843	12.34773	-7.345809
Std. Dev.	0.359142	0.843421	5.615739
Skewness	0.910323	-0.680875	2.505034
Kurtosis	2.903258	1.813669	11.26154
Jarque-Bera	5.263178	5.164432	147.8103
Probability	0.071964	0.075606	0.000000
Observations	38	38	38

Table 3. Unit root tests results

Variable	ADF test statistic			PP test statistic		
	Constant	Constant + Trend	None	Constant	Constant + Trend	None
LOG(Y)	-0.432273	-1.071580	1.013044	-0.606737	-1.071580	1.013044
LOG(TA)	-1.574562	-1.154239	2.109875	-1.574562	-0.980039	2.423937
LOG(Q)	-2.641043*	-3.487508**	-2.580279**	-2.519712	-3.459921*	-2.628961**
Δ(LOG(Y))	-5.179832***	-5.407245***	-5.170459***	-5.179832***	-5.401048***	-5.166563***
Δ(LOG(TA))	-6.360251***	-5.734457***	-5.803635***	-6.367465***	-6.399629***	-5.862482***
Δ(LOG(Q))	-8.105085***	-7.999100***	-8.198987***	-10.05673***	-10.05354***	-9.718246***

*NB: ***, ** and * indicate statistical significance at 1%, 5% and 10% levels of significance, respectively*

4.3 Unit Root Tests

Table 3 presents ADF and PP unit root test results for nominal GDP, number of international tourist arrivals and nominal exchange rate variables under consideration in this study. Nominal exchange rate is stationary at its level form according to both ADF and PP tests. On the other hand, the variables for nominal GDP and number of international tourist arrivals to Zimbabwe are non-stationary at level but stationary at their first difference according to both ADF and PP test results. Therefore, nominal exchange rate, number of international tourist arrivals and nominal GDP variables are I(0), and I(1), respectively; according to the unit root test results of this study. We therefore, proceed to estimate the cointegration tests as outlined in the methodology.

4.4 Cointegration Tests

To carry out these tests, the study was guided by equations [3] and [4]; hence, the ARDL (1, 4, 7) and ARDL (1, 4, 3) models were estimated. In line with previous studies such as Balaguer & Cantavella-Jorda [1], Dritsakis [20] and Belloumi [45], the Akaike Information Criterion (AIC) was used as the model selection criteria.

4.5 When Δ(LOG(Y)) is the Dependent Variable

H_0: There is no cointegration
H_1: There is cointegration

We reject H_0 since the F-statistic is greater than the upper bounds critical values at 2.5% level of significance and conclude that a long run relationship between international tourism and economic growth is established at 2.5% level of significance.

4.6 When Δ(LOG(TA)) is the Dependent Variable

H_0: There is no cointegration
H_1: There is cointegration

We fail to reject H_0 since the F-statistic is less than the lower bounds critical values at all levels of significance and conclude that there is no cointegration between international tourism and economic growth. However, since the main objective of this study is to assess the effect of international tourism on economic growth, and since the long run relationship exists in one and not both equations, we proceed to apply the ARDL approach.

4.7 Serial Correlation Test Result

Guided by Pesaran et al. [49], the serial correlation tests have been performed in order to validate the results of the bounds tests.

In Table 5 shows, since the p-values of the F-statistics are statistically insignificant; we reject the null hypotheses for the existence of serial correlation in the models examined and conclude that there is no serial correlation in the models examined for bounds tests.

Table 4. Cointegration tests

Dependent variable	F-statistic	Decision	Then What?
Δ(LOG(Y))	6.292166	Cointegrated	Estimate ARDL & ECM models
Δ(LOG(TA))	1.088431	Not cointegrated	Estimate an ARDL model only

Critical Bounds Values for Finite Sample Regimes Referenced From Narayan (2005): Case V – unrestricted intercept and trend

Critical Values	1%	2.5%	5%	10%
Upper bounds	7.32	5.98	4.96	3.96
Lower bounds	4.42	3.57	2.90	2.25

Table 5. Serial correlation tests

Variable	LM Test F-statistic	Probability
Δ(LOG(Y))	1.231617	0.3237
Δ(LOG(TA))	1.130963	0.3425

4.8 Results of the Long Run Relationship

The next step was to estimate equation [2] which was specified in an unrestricted ARDL (p, w_1, w_2) model as in equation [6]. Based on the AIC, the long-run relationship was estimated as an ARDL (1, 4, 7) model.

4.9 Results of the Long Run ARDL (1, 4, 7) Model

The results shown in Table 6, starting with nominal GDP as the dependent variable, indicate the existence of long-run relationship among the variables (that is, nominal GDP, international tourist arrivals and nominal exchange rates).The coefficients of the first-lag of nominal GDP and first-lag of international tourist arrivals are positive and statistically significant at 5% level, while the coefficients of fourth-lag of international tourist arrivals and current period nominal exchange rates are negative but statistically significant at 5%, and 1%, respectively.

These findings imply that economic growth is positively influenced by its past values, and those of international tourist arrivals while fourth-lag of international tourist arrivals, and current period nominal exchange rates negatively influence economic growth in Zimbabwe. An increase in international tourist arrivals (in the previous period) by 1% will more than proportionately increase economic growth by approximately 0.37%. This implies that promoting international tourism will stimulate economic growth in Zimbabwe.

These results support the validity of the TLGH in the long run in Zimbabwe and are particularly in line with many country-specific studies such as Balaguer & Cantavella-Jorda [1], Durbarry [38], Gunduz & Hatemi [39], Belloumi [45], Kibara et al. (2012), Chor & Ozturk [67], Shakouri et al. [55] and Sharma [68]. These results are also in line with a number of studies done based on the analysis of panels of countries, for example, Govdeli & Direkci (2017) and Azeez [69]. More interestingly, these results are consistent with Makochekanwa (2014) and Nene & Taivan [18] who conducted panel-data studies where Zimbabwe was also included, that is, for the SADC and SSA regions, respectively.

On the other hand a 1% increase in international tourist arrivals (over the past 4 years) resulted in a more than proportionate decrease in economic growth by approximately 0.34%. In line with the Dutch disease argument [70], Glauco & Khine (2017) noted that such a scenario could be attributed to the fact that international tourism development may hamper long-term economic growth if it draws resources and labor from other industries to tourism-led sectors, thereby increasing local land and house prices and ultimately reducing social welfare. Similarly, Javier et al. (2007) argue that an excessively tourism-oriented economy may result in less dynamic and low efficient growth precisely because the tourism industry is vulnerable to an

Table 6. ARDL (1, 4, 7) model

Dependent Variable: LOG(Y)				
Variable	**Coefficient**	**Standard Error**	**t-Statistic**	**Probability**
LOG(Y(-1))	0.413788	0.186102	2.223449	0.0420**
LOG(TA)	-0.139167	0.119563	-1.163961	0.2626
LOG(TA(-1))	0.373321	0.139937	2.667778	0.0176**
LOG(TA(-2))	-0.174457	0.137191	-1.271639	0.2229
LOG(TA(-3))	-0.041094	0.171948	-0.238992	0.8143
LOG(TA(-4))	-0.335151	0.156905	-2.136016	0.0496**
LOG(Q)	-0.030087	0.004892	-6.150913	0.0000***
LOG(Q(-1))	0.005619	0.008089	0.694640	0.4979
LOG(Q(-2))	0.001456	0.004143	0.351528	0.7301
LOG(Q(-3))	0.005245	0.004438	1.181914	0.2556
LOG(Q(-4))	-0.000469	0.004271	-0.109743	0.9141
LOG(Q(-5))	0.006319	0.004271	1.479473	0.1597
LOG(Q(-6))	0.003595	0.004794	0.749803	0.4650
LOG(Q(-7))	0.005814	0.004802	1.210670	0.2448
C	16.96457	5.055090	3.355937	0.0043***
@TREND	0.038888	0.013260	2.932720	0.0103**

*NB: ***, ** and * indicate statistical significance at 1%, 5% and 10% levels of significance, respectively*

increasing number and range of external shocks such as political risk, financial crises and infectious disease outbreak shocks. Furthermore, the hypothesis that the magnitude of the effect of international tourism on economic growth is not different from zero is rejected, on the basis of the evidence presented in Table 6.

The coefficient of the current period nominal exchange rates has the expected negative sign and is statistically significant at 1% level of significance. This means that economic growth is negatively affected by nominal exchange rates in Zimbabwe. An exchange rate appreciation by 1% will more than proportionately decrease economic growth by approximately 0.03%. This is quite reasonable given the fact that an exchange rate appreciation causes a slower growth of the economy due to a fall in net exports and a rise in the demand for imports. In the same line of thought, Basirat et al. [71] highlighted that, exchange rates, through fluctuations; may hinder economic growth, especially in developing countries such as Zimbabwe where financial markets are undeveloped. These results are consistent with previous studies done in Zimbabwe, for example; Ndlela [72], Masunda [73] and Brixiova & Ncube [74].

The estimated long run model in Table 6 has an acceptable goodness of fit with an adjusted R^2 of approximately 0.957. This implies that approximately 95.7% of variation in economic growth is explained by changes in international tourism and exchange rates. The model is also correctly specified and the estimated parameters are stable as shown by stability tests in Figs. 2 and 3 below. From this model, the Error Correction Term (ECT) was derived and used to estimate the short run dynamics of the ARDL-ECM model as shown in Table 8 below.

4.10 Stability Tests of the Long Run ARDL (1, 4, 7) Model

Figure 2 plots the results for CUSUM test for ARDL. The findings show the absence of any instability of the coefficients because the plots of the CUSUM statistics fall inside the critical bands of the 5 per cent confidence intervals of parameter stability. Therefore, there exists stability in the coefficients over the sample period for Zimbabwe.

4.11 Results of the Long Run ARDL (1, 4, 3) Model

With international tourist arrivals as the dependent variable, the results shown in Table 7, indicate that the coefficients of its first-lag, nominal GDP in the second, third and fourth-lags as well as the second-lag of nominal exchange rates are statistically significant. The first-lag coefficient of international tourist arrivals is positively related to its current year values and statistically significant at 1% level of significance. The second and fourth-lag coefficients of nominal GDP are positively related to international tourist arrivals and statistically significant at 5% level of significance.

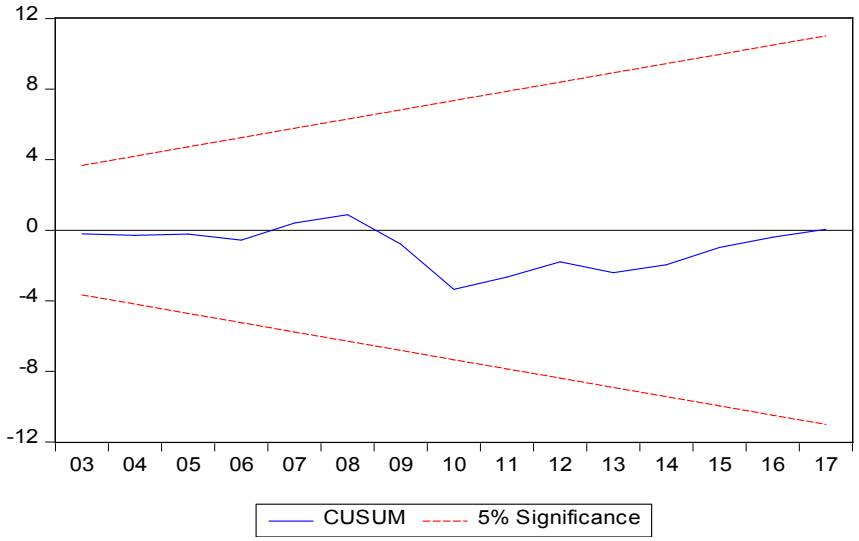

Fig. 2. CUSUM test of the ARDL (1, 4, 7) model

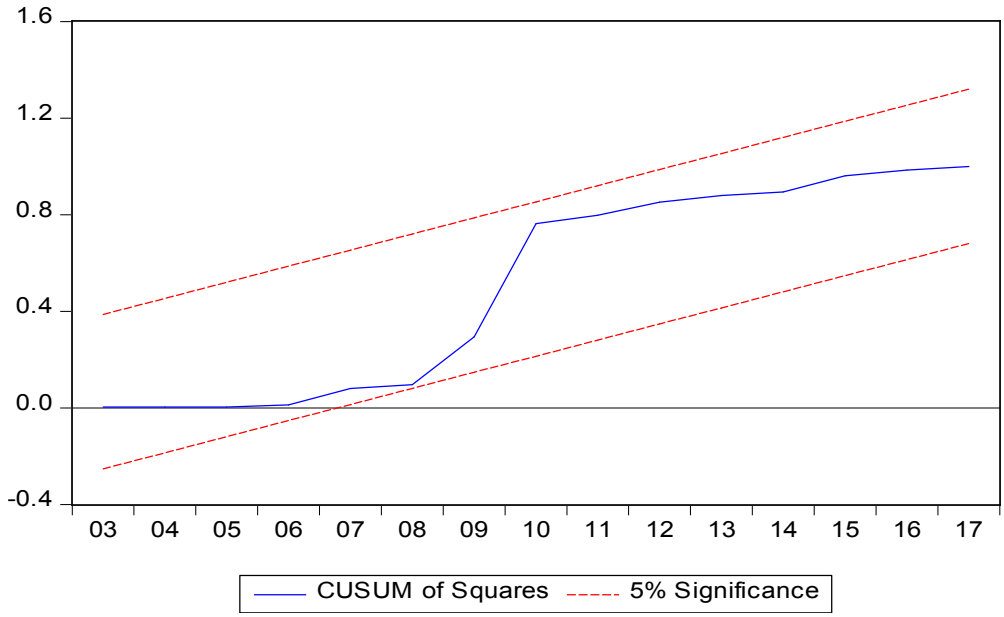

Fig. 3. CUSUMSQ test of the ARDL (1, 4, 7) model

Table 7. ARDL (1, 4, 3) model

Dependent variable: LOG(TA)				
Variable	**Coefficient**	**Standard Error**	**t-Statistic**	**Probability**
LOG(TA(-1))	0.915076	0.096350	9.497379	0.0000***
LOG(Y)	-0.230116	0.251683	-0.914308	0.3705
LOG(Y(-1))	-0.320193	0.388084	-0.825061	0.4182
LOG(Y(-2))	1.283831	0.392152	3.273811	0.0035**
LOG(Y(-3))	-1.288244	0.328721	-3.918956	0.0007***
LOG(Y(-4))	0.563099	0.170292	3.306672	0.0032**
LOG(Q)	-0.013172	0.009044	-1.456396	0.1594
LOG(Q(-1))	-0.008516	0.011317	-0.752552	0.4597
LOG(Q(-2))	0.033336	0.011308	2.948168	0.0074**
LOG(Q(-3))	-0.019780	0.009605	-2.059250	0.0515
C	0.954144	5.834034	0.163548	0.8716
@TREND	0.005544	0.013939	0.397697	0.6947

*NB: ***, ** and * indicate statistical significance at 1%, 5% and 10% levels of significance, respectively*

An increase in economic growth, (in the past 2 years), by 1% will more than proportionately increase international tourism development by nearly 1.28% while a similar increase in economic growth in the past 4 years will more than proportionately increase international tourism development by almost 0.56%. This implies that economic expansion will enhance tourism revenues in Zimbabwe. These results support the validity of the EDTGH in the long run in Zimbabwe and particularly consistent with country-specific studies such as Phiri [23] and studies done based on the analysis of panels of countries, for example, Lean et al. [25] and Alhowaish [24].

However, the coefficient of the third-lag of nominal GDP is negatively related to international tourist arrivals and is statistically significant at 1% level of significance. In this regard, an increase in economic growth, (in the past 3 years), by 1% will more than proportionately decrease international tourism development by approximately 1.29%. This can be attributed to the fact that local economic expansion may harm tourism growth if government policies and institutions are biased towards other sectors while neglecting the tourism sector. This usually happens when local economic expansion draws resources and labor from the tourism sector or utilizes resources and

labor that could have been allocated to the tourism sector resulting in sluggish growth of the tourism sector. Hence tourism development remains poor.

In the case of Zimbabwe, as a matter of fact, government policies and institutions, over the years, have been skewed towards agriculture and mining sectors. This is corroborated by the fact that the tourism sector in Zimbabwe has been based on a mere concept of low volume high yield tourism which was not even backed by a comprehensive tourism policy, save for the Tourism Act [Chapter 14: 20] of 1996 and other pieces of regulations such as liquor licensing.

It is imperative to note that, the hypothesis that the magnitude of the effect of economic growth on international tourism is not different from zero is rejected, on the basis of the results shown in Table 8 above. The coefficient of the second-lag of the nominal exchange rate variable is positive and statistically significant at 5% level of significance; while the coefficient of the third-lag of the nominal exchange rate is negative and statistically significant at 10% level of significance.

The estimated long run model in Table 7 has an acceptable goodness of fit with an adjusted R^2 of approximately 0.969. This implies that approximately 96.9% of variation in international tourism is explained by changes in economic growth and exchange rates. The model is also correctly specified and the estimated parameters are stable as shown by stability tests in Figs. 4 and 5 below.

4.12 Stability Tests of the Long Run ARDL (1, 4, 3) Model

The results of the Granger causality test estimated in an error correction framework specified as an ARDL-ECM model are presented in Table 8 show. The results indicate that the coefficient of the lagged error correction term (ECT(-1)) has the expected negative sign, is within the expected range of $-1 \leq ECT(-1) < 0$ and is statistically significant at 1% level of significance. This implies the existence of a stable long run relationship and points to a long run cointegration relationship between international tourism and exchange rates and economic growth in the long run. Hence, these results reaffirm the validity of the TLGH in the long run in Zimbabwe. The coefficient of the lagged error correction term is -0.59, implying that a deviation from the long run equilibrium following a short run shock is corrected by about 0.59% after one year. This speed of adjustment after a shock is comparatively high and is not only acceptable but also reasonable for a small open economy like Zimbabwe where international tourism is increasingly becoming the new economic powerhouse.

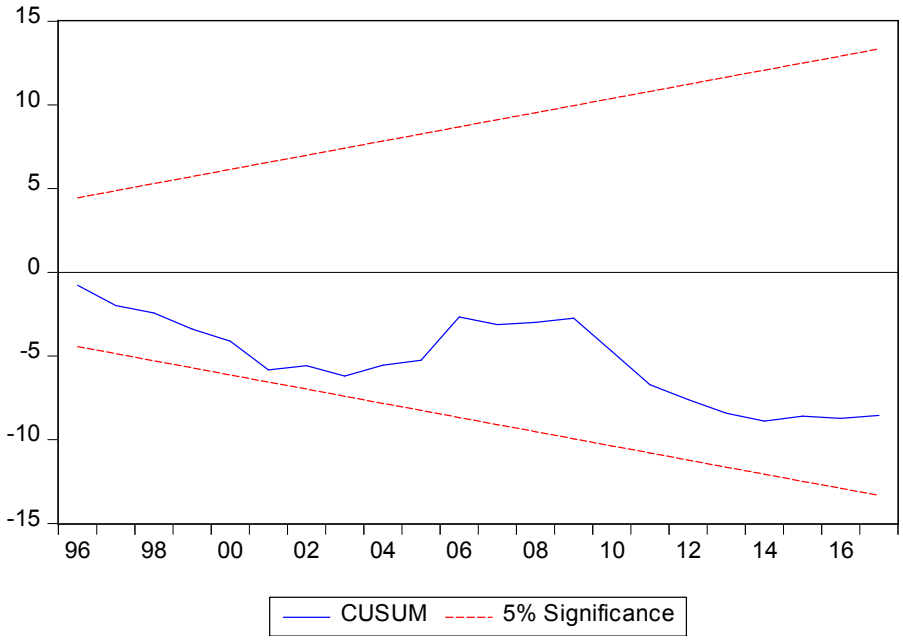

Fig. 4. CUSUM test of the ARDL (1, 4, 3) model

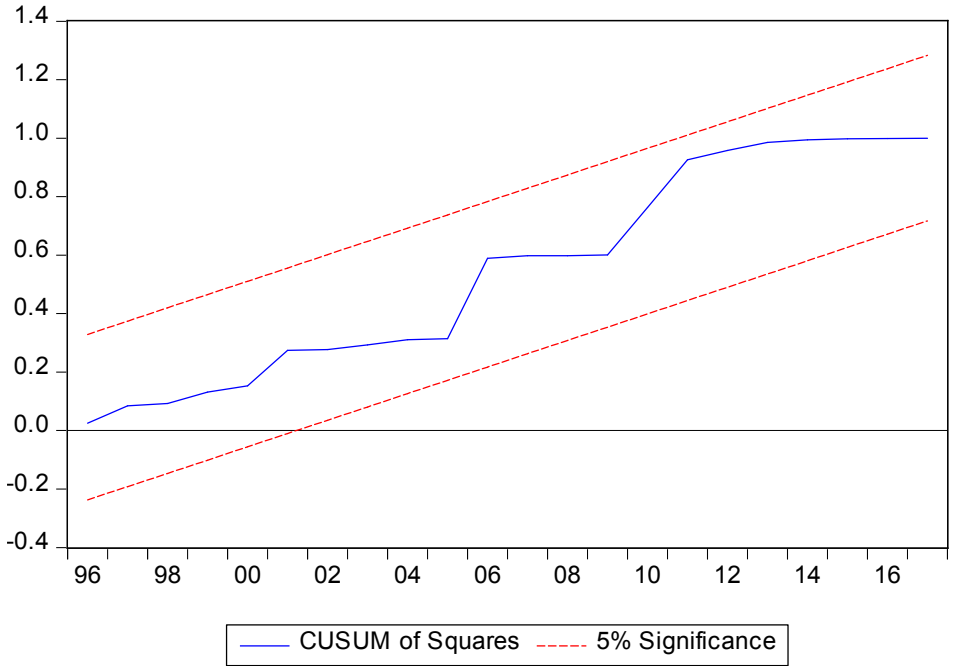

Fig. 5. CUSUMSQ test of the ARDL (1, 4, 3) model

4.13 Results of the Short Run Relationship – Error Correction Model (Causality Test)

Table 8. ARDL-ECM model

Dependent Variable: D(LOG(Y))				
Variable	**Coefficient**	**Standard Error**	**t-Statistic**	**Probability**
C	16.96457	3.668511	4.624374	0.0003***
@TREND	0.038888	0.008280	4.696822	0.0003***
DLOG(TA)	-0.139167	0.104320	-1.334043	0.2021
DLOG(TA(-1))	0.550702	0.131927	4.174282	0.0008***
DLOG(TA(-2))	0.376245	0.147116	2.557475	0.0219**
DLOG(TA(-3))	0.335151	0.146351	2.290043	0.0369**
DLOG(Q)	-0.030087	0.003640	-8.266138	0.0000***
DLOG(Q(-1))	-0.021960	0.005565	-3.946325	0.0013***
DLOG(Q(-2))	-0.020504	0.005552	-3.693046	0.0022
DLOG(Q(-3))	-0.015259	0.005199	-2.934748	0.0102**
DLOG(Q(-4))	-0.015728	0.005308	-2.962948	0.0097***
DLOG(Q(-5))	-0.009409	0.004980	-1.889438	0.0783*
DLOG(Q(-6))	-0.005814	0.004022	-1.445425	0.1689
ECT(-1)	-0.586212	0.126740	-4.625296	0.0003***

*NB: ***, ** and * indicate statistical significance at 1%, 5% and 10% levels of significance, respectively*

Furthermore, the results indicate statistical significance in the coefficients of the first, second and third-lags of international tourist arrivals and first, third, fourth and fifth-lags of nominal exchange rates. The coefficient of the first-lag of international tourist arrivals is positive and statistically significant at 1% level of significance. An increase in international tourism development, (in the previous year), by 1% will more than proportionately increase economic growth by approximately 0.55%. The coefficients of the second and third-lags of international tourist arrivals are also positive and statistically significant at 5% levels of significance. An increase in international tourism development, (in the past 2 years), by 1% will more than proportionately increase economic growth by almost 0.38% while a similar increase in

international tourism development in the past 3 years will more than proportionately increase economic growth by around 0.34%.

The statistical significance of the coefficients of the first, second and third-lags of international tourist arrivals also indicate short-run validity of the TLGH in Zimbabwe. This apparently means that promoting international tourism development will stimulate economic growth in Zimbabwe, not only in the long run but also in the short run. The coefficients of the current period, first-lag and fourth-lag nominal exchange rates are negative and statistically significant at 1% level of significance. The coefficient of the third-lag nominal exchange rates is negative and statistically significant at 5% level of significance while the coefficient of the fifth-lag of nominal exchange rates is also negative and statistically significant at 10% level of significance. The short run results show that previous period international tourist arrivals (lagged by 1 up to 3 periods (years)) leads to economic growth in the short run. Hence, the null hypothesis that international tourism does not stimulate economic growth is rejected both in the short-run and long-run in Zimbabwe.

4.14 Diagnostic Tests of the ARDL-ECM Model

4.14.1 LM, reset and heteroskedasticity tests of the ARDL-ECM model

Diagnostic tests were conducted, and the results are presented in Table 9. As can be seen, the model has the desired econometric properties. Therefore, the findings are valid for meaningful interpretation.

4.14.2 Stability tests of the ARDL-ECM model

The ARDL-ECM model passed all the necessary diagnostic tests as shown in Table 9 since the probability values are insignificant. Hence, the model is stable and correctly specified. It is also imperative to note that there is no evidence of structural breaks from 1980 to 2017 as shown by the test statistics of the CUSUM and CUSUMSQ stability tests, which apparently lie within the critical bounds of 5% significance as shown in Figs. 6 and 7, respectively.

Table 9. LM, Reset and Heteroskedasticity Tests of the ARDL-ECM model

Test Statistic	F-statistics	Probability
LM test	1.231617	0.3237
Reset test	1.225177	0.2870
Heteroscedasticity test	0.396017	0.9586

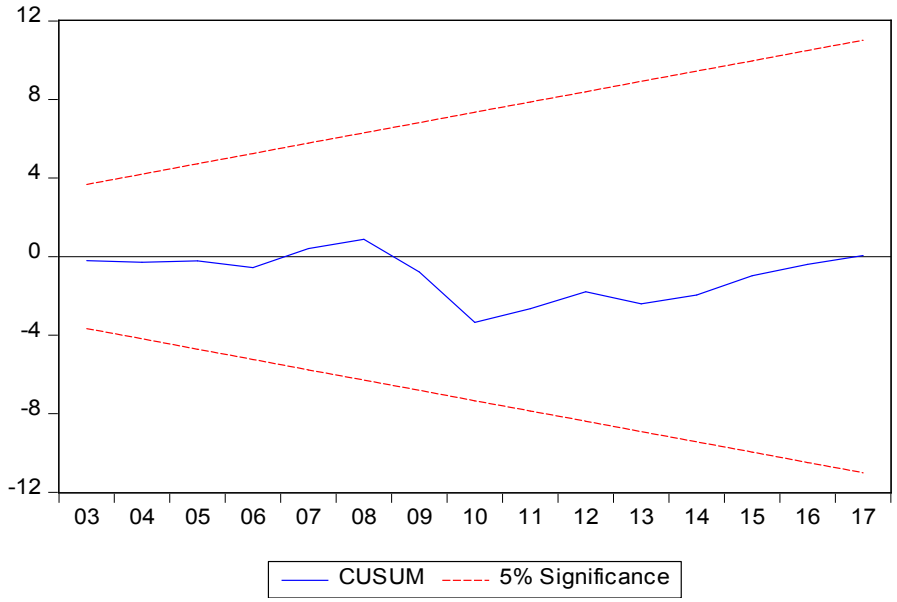

Fig. 6. CUSUM test of the ARDL-ECM model

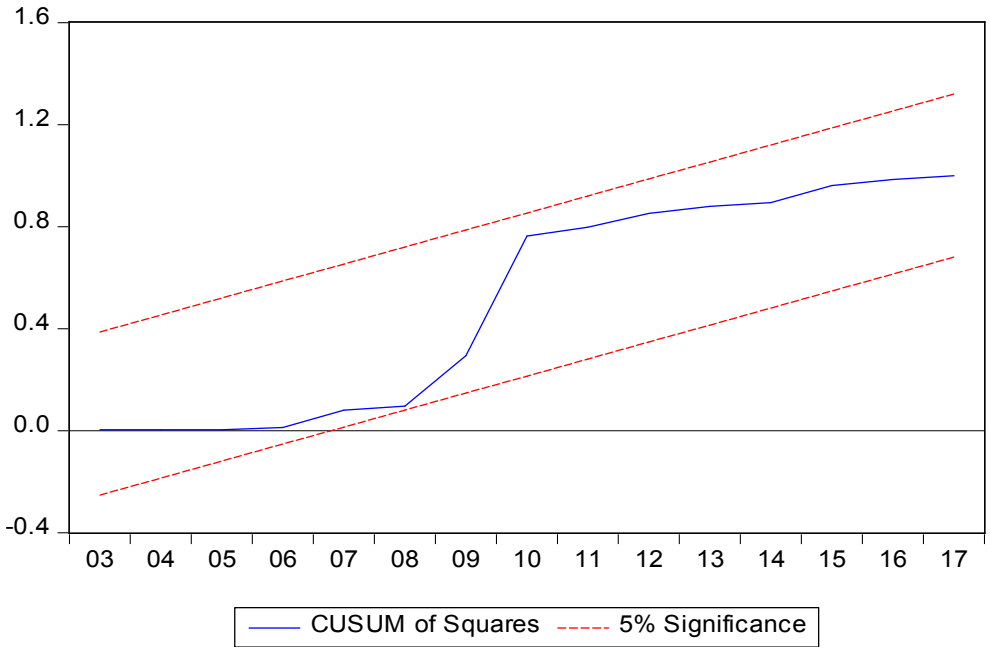

Fig. 7. CUSUMSQ test of the ARDL-ECM model

The results established by this study support the validity of the TLGH in Zimbabwe and are not only consistent with other Zimbabwean studies such as Makochekanwa (2014) and Nene & Taivan [18] but also in line with the findings of the main proponents of the tourism-growth model, that is; Balaguer & Cantavella-Jorda [1]. It is almost unnecessary to pinpoint the fact that the results of this study are also similar to a myriad of other studies done across the globe, such as Durbarry [38], Gunduz & Hatemi, [39], Fayissa et al. [75], Belloumi [45], Samimi et al. [65], Seetanah [33], Dritsakis [46], Ekanaye & Long (2012), Kibara et al. (2012), Surugiu & Surugiu (2013), Hye & Ali-Khan [54], Shahzad et al. [76], Tang & Tan [36], Chor & Ozturk [67], Shakouri et al. [55], Akighir & Aaron [41], Sharma [68], Roudi et al. [61], Jeyacheya & Hampton (2020) and Tsung-Pao & Hung-Che [77].

The study, just like other previous studies such as Lean et al. [25], Phiri [23], Wu & Wu [42] and Suryandaru (2020); also supports the validity of the EDTGH in the long run in Zimbabwe. Indeed, pro-growth policies are not unimportant in luring international tourist arrivals into the country, especially given the fact that nowadays international tourists are increasingly selective in the sense that they tend to visit countries whose economies are performing better as compared to countries whose economies are poorly performing.

However, these results contradict other studies, particulary those who support the NRH [24] and RH [26,50]. This contradiction could be attributed to the fact that these studies (for example, Seghir et al., 2015) have omitted the exchange rates variable which is deemed critical in tourism growth models as explained by Balaguer & Cantavella-Jorda [1], Oh [19], Katircioglu [21,44,78] and Dritsakis [46].

5. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

In this study, an inquiry has been made on the effect of international tourism on economic growth in Zimbabwe. Thetime series data used covers the period 1980 to 2017. The study employed the bounds testing approach to cointegration within the ARDL technique, to test the existence of a long run relationship between international tourism and economic growth. The associated ARDL-ECM model was estimated not only to test for causality but also to capture short-run dynamics. Given the lack of consensus on the international tourism – economic growth nexus and the overall role of international tourism in foreign exchange generation in both developed and developing countries; as well as

the lack of an evidence-driven tourism policy in Zimbabwe and the fact that single-country studies for Zimbabwe are scanty, it was inexorably instructive to carry out this study. Results supported the validity of the TLGH both in the short-run and long-run. The EDTGH was found to be valid only in the long run. The results of this study overwhelmingly endorse the argument initially made by this study that international tourism could be a root of escape to boosting the country's economic performance. Hence, international tourism is a dynamic "sunrise" sector; that is indeed, a pathway to economic recovery in Zimbabwe.

5.2 Recommendations

From a TLGH point of view, promoting international tourism; especially through long term strategic plans such as the country's National Tourism Policy, National Tourism Master Plan and the National Tourism Strategy; will stimulate economic growth in Zimbabwe, both in the short-run and long-run. Thus, the Government of Zimbabwe should allocate more resources towards supporting tourism sector infrastructure such as road, rail and air transport networks and tourist sites such as the Victoria Falls and the Great Zimbabwe National Monument and other tourism related industries such as the crafts & design and pilgrimage industries, in order to grow the economy. As a result of COVDI-19 Tourism is one of the most affected sectors in the economy affecting economic livelihood of millions of people in Zimbabwe, government revenue and workers. Thus above policy recommendations must also consider the endogenous effect of COVID-19 on Tourism. The study calls on the urgency of mitigating the impacts on livelihoods, economy and informal workers. Guided by the EDTGH long-run lens; the Government of Zimbabwe should allocate resources to other sectors currently driving the economy such as the agriculture, mining and manufacturing sectors in order to invigorate international tourism development and induce sustainable economic growth in the country. The tourism industry as well as tourism related industries will then benefit from these other leading sectors and in turn drive economic growth in the long run.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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