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Tourism expansion and economic growth in Tanzania: A causality analysis

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ABSTRACT

After the economic liberalization in mid-2000, Tanzania has assumed that tourism growth spars economic growth due to the consistent significant contribution of tourism sector to the country's annual income. However, there are limited empirical studies that investigated tourism-economic growth relationship in Tanzania. This study aims to investigate an empirical insight into the actual nature of tourism-economic growth in Tanzania by applying the Granger causality and Wald test methods where annual time series data on international tourism receipt, real Gross Domestic Product, and real effective exchange rate over the period 1989–2018 are used. Further, the Impulse Response Function approach is utilized to provide insight into the qualitative nature of the relationships and the length of time necessary for the causal effect to take place. The findings confirm a unidirectional causality from tourism development to economic growth. The study concludes that Tanzania ought to focus on economic strategies that encourage sustainable tourism development as a feasible source of economic growth.

1. Introduction

The tourism sector is among the fastest-growing sectors in the global economy. The World Travel and Tourism Council 2020 report shows that globally, in 2019 tourism sector contributed 10.3% (US$ 8.9 trillion) of global Gross Domestic Product (GDP) and 330 million jobs, which is about 10% of all global employment (WTTC, 2020). The report further affirms that the growth rate of the global tourism sector in 2019 outpaced the overall global economic growth rate: the sector grew at 3.5% as compared to the global economic growth rate of 2.5%. Besides, the sector's role in the overall improvement of human development through income and job creation, tourism is making a significant contribution in many countries towards the balance of payment, poverty alleviation, foreign exchange generation, creation of a market for indigenous commodities, promotion of the hospitality industry, and stimulation of transport sector development (Gisore and Ogutu, 2015; Sarpong et al., 2020).

The tourism sector's contribution to the economies of developing nations is incredibly significant. For instance, in Tanzania, the tourism sector is second after the manufacturing sector in contributing to the national income. In particular, the travel and tourism sector's contribution to GDP in 2019 was US$ 6,577.3 million, equivalent to 10.7% of the country's GDP (WTTC, 2020). The sector created 1,550,100 jobs in 2019, which is equivalent to 11.1% of the country's total employment. The tourism sector in Tanzania is also instrumental in the fight against abject poverty through job creation and the development of a market for traditional products (Luvanga and Shitundu, 2003; Odhiambo, 2011; Wamboye et al., 2020). The development of the tourism sector in Tanzania, and the developing countries at large, is also a stimulant for the development of transport and hospitality industries (Gisore and Ogutu, 2015; Sokhanvar et al., 2018). The consistent increase of international tourism receipts, as a special form of export, contributes to increasing forex and a better balance of payment (Gisore and Ogutu, 2015; Luvanga and Shitundu, 2003). In total, Tanzania has 44 game-controlled areas; 16 national and 2 marine parks, 28 game reserves, several forest reserves, and 1 conservation area hosting the world's renowned biodiversity, wildlife, and unique ecosystems (Wamboye et al., 2020).

In terms of international tourism receipts, Tanzania exhibits a unique trend as compared to other emerging economies in Africa. For instance, over the period 2010–2019, the average international tourism receipt (% of total exports) for Tanzania was 23.95%, Uganda 21.17%, Kenya 16.22%, South Africa 9.24%, Ghana 5.85% and Mozambique 4.68% (World Bank, 2021). These figures suggest that Tanzania has a comparative advantaged of building up her economy by investing on tourism sector. Besides, Tanzania is endowed with massive storehouse of nature-tourism, which in turn has made the tourism industry in the recent years a robust source of growth. A World Bank source discloses that Tanzania has attained a high-value low-density (HVLD) tourist destination because the sector has a strategy of targeting high ended segment of the market which is normally unaffected by seasonal

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economic fluctuations (World Bank, 2015). As a result, in contrast with other emerging economies such as Kenya which attracts more tourists, HLVD enables Tanzania to make more revenue for it attract visitors from more price inelastic market segment.

The growth in tourism sector is expected to continue and thus lead to increased government revenue (through taxation and foreign exchange) and improved household revenue (through increased employment income: salaries, wages, interest, etc.). The WTTC 2020 report attests that globally, the travel and tourism sector will significantly drive the global economic recovery after COVID-19 through job creation and its economic effect on suppliers across the whole supply chain.

Tugcu (2014) affirms that growth in the tourism sector can at least be used in three major ways: first, increase regional and seasonal employment and, as a special type of export, tourism growth generates foreign currency. Second, tourism development promotes the growth of transport sector, hospitality industry, and construction in the host country. Third, tourism growth can be used by policymakers to contract income inequalities in the host country. Further, Sokhanvar et al. (2018) attest that tourism development has the potential to increase the price of non-traded local goods and services, thereby increasing the employment of people and use of resources, which culminate in improved people's wellbeing.

The importance of the tourism sector in economic growth has inspired many researchers to assess the actual nature of the tourism-income relationship. To this end, some have employed various econometric models and variables to assess the relationship in a particular country (Mérida and Golpe, 2016; Ribeiro and Wang, 2019; Suryandaru, 2020; etc.) or group of countries (Bilen et al., 2017; Kareem, 2013; Shahzad et al., 2017; etc.). While some researchers have specified a bivariate model to assess the tourism-income relationships (Bilen et al., 2017; Sak and Karymshakov, 2012; Suryandaru, 2020; etc.), others have specified multivariate models (Georgantopoulos, 2013; Lawal et al., 2018; Tang and Tan, 2015; etc.). The results are frequently mixed: some confirm one-way causal relationship (Kibara et al., 2012; Lin et al., 2019; Surugiu and Surugiu, 2013; Suryandaru, 2020; etc.) others bi-causality (Bilen et al., 2017; Lawal et al., 2018; Wu and Wu, 2018; etc.) yet others produce evidence of no causality between tourism expansion and economic growth (Ekanayake and Long, 2012; Jin, 2011; Tugcu, 2014), etc.

Most of the developing nations have identified tourism growth as a tool for economic development and poverty alleviation. This is due to the sector's continued significant annual contribution to the national income. For instance, Tanzania is committed to promoting the tourism sector, alongside mining, manufacturing, and agriculture sectors, as a way to realize greater economic growth and poverty alleviation and improved welfare for all; the sector is ranked 4th among the 140 countries because of the country's tourism-related endowments (Tanzania. Wizara ya Fedha na Mipango, 2016). Nevertheless, there are limited empirical studies carried out to investigate the tourism-income relationship among the developing nations (Wamboye et al., 2020); most of the studies focus on Europe, Latin America, Asia, and the Middle East; scanty studies focus on Africa.

For instance, we found only one study by Odhiambo (2011) that empirically assesses the tourism-economic growth relationship in Tanzania. Odhiambo's study employed the Granger causality ARDL approach to assess the annual time series data on real GDP, international tourism receipts, and real exchange rate for the period 1980–2008. Nevertheless, the real GDP and tourism receipts entered the model erroneously as actual values (US$). The actual tourism receipt (US$) and real GDP (US$) values is likely to produce spurious causal relationship because the GDP from tourism may increase but other sectors may also increase in such a way that the proportionate share of tourism to the GDP decreases over time, such that the tourism contribution to the GDP may not be as significant.

The current study takes a different approach: first, the tourism receipts and the real GDP enter the model as a percentage of the real GDP (T_t) and the real GDP growth rate (Y_t) respectively. Then, the real effective exchange rate enters the model as an annual percentage change in the real effective exchange rate (R_t). When the real effective exchange rate index increases, it signifies the appreciation of the local currency against the basket of currencies of trading partners from the rest of the world. Second, in addition to the Granger causality and Wald test, we employ, for analysis, the Impulse Response Function (IRF) to assess the impact on one variable following a shock to another variable, using the most recent annual data on tourism, economic growth, and real effective exchange rate.

Therefore, the objective of this study is to investigate a reliable empirical insight into the actual nature of tourism-economic growth relationship in Tanzania. The research is motivated by the fact that the assumed tourism-led growth hypothesis in Tanzania lacks adequate, correct, and up-to-date robust empirical evidence. The findings from this research will therefore make a significant contribution towards narrowing the gap in tourism-income relationship literature in Tanzania, and thereby provide a solid foundation as a basis for formulation of tourism-economic growth related policies not only in Tanzania, but also in other similar countries. Besides, to the best of authors' understanding, the IRF approach has not been used earlier to assess the tourism-income relationship in Tanzania. Hence our current study provides a unique contribution to the existing literature.

The rest of this paper is organized as follows: Part Two makes a review of the four traditional income-tourism hypotheses: the growth hypothesis, the reverse hypothesis, the neutral hypothesis, and the feedback hypothesis (Oh, 2005; Tugcu, 2014). Under each hypothesis, the review is subdivided into 2 categories: studies focusing on a single country and those focusing on a group of countries. Due to the fast-growing number of researches on this area, except for some seminal works, our review is limited to a sample of studies published over the last 10 years i.e., from 2010 onward. Part Three focuses on data and methodology, while Part Four makes a presentation and discussion of the findings. Part Five consists of concluding remarks, policy recommendations, and delineates some aspects for further research.

2. Review of literature

To examine the dynamic relationship between tourism growth and economic growth, various approaches have been used in terms of the type of data and the methodology employed. Some studies have used time series data to assess the relationship for one country, while others have attempted a comparative study and so employed panel data across countries. Likewise, various methodological approaches are being used: some studies employ a qualitative approach coupled with descriptive statistics to estimate the influence of tourism on growth. Gradually, researchers are adopting the quantitative econometric tools to empirically assess the economic growth-tourism relationship. Many quantitative studies rally behind Granger causality, ARDL bounds test, and Johansen cointegration test to validate the hypothesis and determine the direction of causality. The outcomes are quite diverse and can be classified into 4 categorical hypotheses as follows.

2.1. Tourism led-growth hypothesis

Studies on the tourism-led growth hypothesis (TLGH), also commonly referred to as the growth hypothesis, attests that tourism development causes economic growth. This implies that greater economic growth can be experienced if the government encourages economic policies that promote tourism development (Sokhanvar et al., 2018). Thus, TLGH studies validate a unidirectional causality from tourism to economic growth. Some of these studies use time series data and focus on a single country. For instance, in Uruguay, Payne & Mervar (2010), employed quarterly data from 1987 q1 to 2006 q4 on real per capita GDP, Argentinean tourism expenditure (the main source of tourism in Uruguay), and real exchange rate, i.e., Argentina vs. Uruguay, to examine the effect of tourism on the long-run economic development. The Granger causality

and Johansen cointegration tests confirmed tourism led economic growth for Uruguay. Still, in Asia, similar results were obtained by Katircioğlu (2010) for Singapore, Mishra et al. (2011) for India, and Lin et al. (2019) for China.

Motivated by the question of whether tourism is pro-growth in the case of Kenya, Kibara et al. (2012), carried out a study to examine the dynamic relationship between tourism and economic growth using annual time series data on real GDP, number of tourist arrivals, and the volume of trade over the period 1983–2010. The ARDL bounds testing and causality test based on ECM confirmed unidirectional causality from tourism to economic growth.

The recursive Granger causality test and the combined cointegration test, have also been used to assess TLGH. For instance, Tang and Tan (2013), examined the stability of tourism – economic growth relationship for 12 tourism destination markets in Malaysia, utilizing monthly data over the period from January 1995 to February 2009. The study generated evidence in support of TLGH in 8 out of 12 tourism markets. Using different methodologies but still in Asia, Hye & Khan (2013) examined the cointegration between tourism income and economic growth in Pakistan by employing time series annual data for the 1971–2008 period. The ARDL and Johansen cointegration methods generate evidence in support of TLGH except for the period 2006–2008.

To analyze the relationship between economic growth and tourism receipts in the case of Sao Tome, Ribeiro & Wang (2019) employed annual time series data on GDP, tourism receipts, foreign direct investment, and real exchange rate for the period 1997–2018. The Johansen cointegration test confirmed cointegration among the variables, while the Granger causality test generated evidence in support of unidirectional causality from tourism receipts to economic growth.

Besides TLGH studies focusing on a single country, some researchers have attempted to validate the hypothesis by bringing together several countries. Such studies include Bouzahzah and El Menyari (2013); Brida et al. (2016); Dritsakis (2012); Nene and Taivan (2017); and Shahzad et al. (2017). For instance, Dritsakis (2012) carried out a study to examine the dynamic relationship between tourism income and economic growth in 7 Mediterranean countries using the Panel Cointegration and Fully Modified Ordinary Least Square (FMOLS) approaches on panel data, real per capita tourism receipts, number of international tourist arrivals, real effective exchange rate, and real GDP over 1980–2007 period. The study confirmed the validity of TLGH in all the seven Mediterranean countries.

Other TLGH studies include Shahzad et al. (2017) for top 10 tourism destination in the world, Surugiu and Surugiu (2013) in the case of Romania, Bouzahzah & El Menyari (2013) for North Africa, Tang & Abosedra (2014) for Lebanon, Brida et al. (2016) on systematic literature review for over 100 countries, Tang and Tan (2015) who decided to revisit their 2013 case for Malaysia, Hampton & Jeyacheya (2020) on 58 Small Island Developing States, and Nene and Taivan (2017) who investigated the validity of TLGH in 10 sub-Saharan African countries. The details of these studies are summarized in Appendix A.

2.2. Reverse hypothesis

The reverse hypothesis rejects the view that tourism causes economic growth but affirm that economic growth is the cause of tourism development, i.e., growth-led tourism hypothesis (GLTH). This means that the government can conveniently direct subsidies away from tourism to other sectors without generating an adverse effect on economic growth (Sokhanvar et al., 2018). For instance, Payne & Mervar (2010) examine the tourism – economic growth relationship for Croatia using quarterly time series data on real GDP, real effective exchange rate, and real international tourism receipts over 2000–2008 period. The Toda-Yamamoto test result lends support for growth-led tourism in Croatia. Likewise in Singapore, Lee (2012) used annual data on international tourism receipts, real GDP, exports, and imports over the period 1980–2007. Employing ARDL bounds testing and the Granger causality approach, the study revealed a short-run causality from economic growth to tourism.

Ahiawodzi (2013) utilized annual time series data on real GDP and real tourism earnings for Ghana over 1985–2010 to examine the tourism – economic growth long-run relationship. The Johansen-Juselius test was employed to examine cointegration among the variables. The Granger causality test results supported the economic growth-led tourism hypothesis.

The reverse hypothesis has also been tested using panel data focusing on a group of countries. For example, Kadir et al. (2011) investigated the influence of tourism on economic growth in the case of 9 ASEAN and non-ASEAN countries using quarterly time series data on real GDP, international tourism receipts, consumer price index, and real effective exchange rates over 1994Q1 – 2004Q4. The Johansen test and Granger causality generated evidence in support of the growth-led tourism hypothesis. Other reverse hypothesis studies, with details summarized in Appendix A, include Aslan (2014); Lin et al. (2019); Suryandaru (2020); Trang, Duc, & Dung, (2014b).

2.3. Feedback hypothesis

The feedback hypothesis represents a category of studies that provides evidence for a bidirectional causality between tourism growth and economic growth. This hypothesis is also commonly referred to as a reciprocal hypothesis because policies to expand tourism also lead to economic growth, and economic expansion tends to promote tourism development (Sokhanvar et al., 2018; Tugcu, 2014). Some of the studies in this category use time series data and focus on a single country. For instance, Odhiambo (2011) examined the tourism-economic growth relationship in the case of Tanzania using annual time series data on the real GDP, international tourism receipts, and real exchange rate for the period 1980–2008. The ARDL bounds test confirms cointegration among the variables, while the Granger causality confirms bidirectional causality between tourism and GDP in the short run and unidirectional causality from GDP to tourism in the long run.

In Spain, Mérida & Golpe (2016) tested causality between cycles of tourism growth and the GDP by utilizing Spanish quarterly time series data on the real exchange rate, the number of nights spent by tourists in accommodation places, and GDP for the period 1980–2013. The Granger causality based on the VAR system confirmed a unidirectional causality from tourism to economic growth during 1980–1985, and bidirectional causality between economic growth and tourism during 2000–2013. Other single country studies on the feedback hypothesis include Perles-Ribes et al. (2017), Lawal et al. (2018); Tang (2013); Wu and Wu (2018).

Some feedback hypothesis studies are centered on a group of countries. For instance, Samimi et al. (2011) evaluated causality between tourism growth and economic growth in 20 developing countries by employing a panel autoregressive (P-VAR) approach and annual data on real GDP and the number of international tourists' arrival over 1995–2009. The test results revealed a bidirectional causality between tourism and economic growth.

Kareem (2013) carried out a study on 30 African countries to assess the contribution of tourism to economic growth. The research utilized the GMM approach to analyze annual data on real GDP, gross capital formation, labor, final consumption expenditure of tourists, number of tourist arrival, and energy consumption during 1990–2011. The study affirmed a bidirectional causality between tourism development and economic growth. Another recent study by Bilen et al. (2017) examined the long-run relationship of tourism and economic growth in 12 Mediterranean countries, using annual data on real GDP and international tourism receipts for the period 1995–2012. The panel Granger causality test result revealed a bidirectional causality between tourism receipts and real GDP. Other studies confirming the feedback hypothesis, with detailed findings summarized in Appendix A, include Apergis and Payne (2012); Ridderstaat et al. (2014); and Sak and Karymshakov (2012).

2.4. Neutral hypothesis

The neutrality hypothesis studies attest no causation between economic growth and tourism development, and so economic growth cannot be realized by promoting tourism growth nor is tourism impacted by changes in economic growth (Oh, 2005; Sokhanvar et al., 2018). For instance, Ekanayake and Long (2012) assessed the causal relationship between tourism receipts and real GDP for 140 developing countries during 1995–2009. The Granger causality test confirmed the neutral hypothesis among the variables. The neutral relationship was also confirmed by (Sak and Karymshakov, 2012) using panel data over 1995–2008 period on tourism receipts and the GDP in 135 countries that were divided into 11 groups. The study revealed no causal relationship in sub-Saharan Africa (24), Central Asia (5), Middle East, North & Central Africa (45).

Antonakakis et al. (2015) used a spillover index approach to examine monthly data on industrial production and the number of international tourists' arrival for 10 European countries[1] over the period 1995–2012. The examination revealed that the relationship between tourism and economic growth is unstable; it is time dependent.

Can and Gozgor (2018) used new index for the market diversification of tourist arrivals and re-assessed the tourism-growth for 8 countries in the Mediterranean region. The study employed individual Granger and panel data non-Granger causality to assess data on annual tourist arrivals, GDP per capita, and tourism market diversification index for the period 1995–2014. The study confirmed tourism led growth in Egypt and Greece, growth lead tourism in France, Morocco and Turkey, and feedback hypothesis in Italy, Spain, and Tunisia.

In China, Wu & Wu (2018) carried out research focusing on China's 12 Western regions using data on real GDP and international tourism receipts over the period 1995–2015. Utilizing the bootstrap Granger causality approach, a neutrality hypothesis was verified in 5 out of the 12 regions; and the reverse hypothesis in 4 regions; growth in 3 and feedback in 2 regions. Other studies on the neutrality hypothesis, with details summarized in Appendix A, include Georgantopoulos (2013) for India, Jin (2011) for Hong Kong, Tugcu (2014) for the Mediterranean Region, and Tang (2013) in the case of Malaysia.

In addition to the above four hypothesis, some scholars have spearheaded studies to assess the impacts of uncertainties such as economic policies, inflation, socioeconomic and metrological variables on domestic tourism spending (Gozgor and Ongan, 2017; Massidda and Etzo, 2012) (Otero-Giráldez et al., 2012). Such studies complement the tourism-growth studies by assessing the determinants of tourism demand itself.

Appendix A summarizes the literature reviewed. Two key conclusions can be drawn from the current review. First, while there is overwhelming evidence of the rapidly increasing significance of tourism in African economies, empirical investigation on tourism-economic growth relationship has not received adequate attention as compared to extensive studies in other parts of the world. For instance, out of the 40 works reviewed, only 3 works (7.5%) were single-country studies focusing on Africa. For African countries to count on tourism development confidently and reliably for sustained economic growth and livelihood improvement, a systematic empirical study on tourism – economic growth nexus at the county level and regional levels is indispensable. Second, to assess the tourism-economic growth relationship, some studies used the actual tourism receipts (constant US$) and the actual real GDP (US$). Nevertheless, the actual values are likely to generate spurious regression results because over time, the actual tourism receipts might be increasing but its proportionate contribution to GDP may not be statistically significant if other sectors are growing in such a way that the share of tourism to GDP decreases overtime. For reliable results, tourism receipts should enter the specified model as a proportionate contribution of tourism receipt to the GDP and the real GDP should be represented by its growth rate. The current study takes Tanzania as a case in point and endeavors to contribute to narrowing the above gaps.

3. Data, conceptual approach and methodology

3.1. Data and conceptual approach

To investigate the relationship between tourism development and economic growth, the annual contribution of tourism revenue to the country's gross domestic product is considered. However, as mentioned in the subsequent section, to avoid generating spurious causality, this study will use the annual percentage contribution of tourism revenue to the GDP as a proxy for tourism growth. Likewise, the annual GDP growth rate will be employed as a proxy for economic growth. This study uses time series annual data on tourism revenue (as % of real GDP), real GDP growth (% annual), and annual percentage change of the real effective exchange rate for Tanzania over the period 1983–2018. The data for the percentage contribution of tourism to GDP are collected from the United Nation Economic Commission for Africa database and the Ministry of Tourism - United Republic of Tanzania (URT). The data for the annual GDP growth rate and the real effective exchange rate is extracted from the World Bank and Bruegel publications database[2]. These databases are well cited in the literature as a source of published up-to-date, robust and comprehensively reliable annual data (Ozturk et al., 2016; Rahman et al., 2020). Our analysis of data is based on empirical estimated results obtained by using econometric/statistical techniques where we employ EView statistical package.

In this study, tourism is singled out as a growth-generating sector for two major reasons. First, the tourism sector in Tanzania has recorded a consistent significant contribution to the real GDP and employment. For example, during the period 2004–2017, the average GDP from tourism was 10.91%, the highest contribution being 12.59% in 2015 and lowest being 9% in 2017 ("ECAStats: The ECA Statistical Data Portal," n.d.). On average, the tourism sector is second after manufacturing for its share of GDP. Following this trend, policymakers in Tanzania have singled out tourism as a key growth generating sector. However, empirical evidence is needed to understand the actual relationship between tourism and GDP in the long and short run. Second, as noted in the literature review and the summary on Appendix A, elsewhere TLG and feedback hypotheses have been tested and generated evidence that tourism is often a growth-generating factor (Lawal et al., 2018; Tang 2013; Wu and Wu 2018; Shahzad et al., 2017; Ribeiro and Wang 2019; etc.)

The real effective exchange rates (R_t) are a significant indicator of the GDP growth because it is a measure of the external competitiveness of an economy (Bouzahzah and El Menyari, 2013). For instance, when exchange rates are overvalued, they negatively affect the export sector and exposes competing import industries to intensive competition from foreign firms. Likewise, overvaluation may end to a tight fiscal and monetary policy (if local authorities attempt to defend the currency), capital flight (when devaluation is anticipated), as well as economic recession, accompanied by a decline in international technology transfer and foreign direct investment (Tarawalie, 2010). All these have a serious bearing on GDP growth. Therefore, R_t has been regularly employed to assess economic growth trends (Apergis and Payne, 2012; Ribeiro and Wang, 2019; Tang, 2013; Trang et al., 2014b).

3.2. Methodology

Before carrying out a causality test on time series data, it is necessary to ensure that the series is stationary. Regression on non-stationary series

[1] Cyprus, Greece, Italy, Portugal, Spain, Austria, Germany, the Netherlands, Sweden, and the United Kingdom.

[2] World Bank database: https://data.worldbank.org; Bruegel publications: www.bruegel.org.

generates spurious results that neither be used for forecasting nor hypothesis testing. Therefore, the Augmented Dickey-Fuller (ADF) test for a unit root will be utilized to check if the series is stationary (Dickey and Fuller, 1979; Pinzón, 2018).

The pairwise Granger causality will show the existence and direction of causality, if any, among the variables. However, it will neither give us insight on the length of time necessary for the causal effect to take place nor the authentic qualitative nature of the relationships. It is from this context that the Impulse Response Function (IRF) is employed to complement the Granger causality method in this research. The IRF is also ideal for tracing the nature of transmission of a single shock within a noisy system of equations and, thus, makes them quite valuable tools in the assessment of economic policies (Blotevogel, 2014; Gershon et al., 2019; Koop et al., 1996; Obadiaru et al., 2020).

To determine causality and its direction, if any, between tourism sector growth (T_t) and economic growth (Y_t), the study will employ the Wiener-Granger causality technique, popularly known as the Granger causality test (Granger, 1988). Granger causality has a strength of assessing the effect of lag values of one variable on the current value of another variable (Bates et al., 2013; Hamdan et al., 2020; Obadiaru et al., 2020; Sethi et al., 2019). The annual percentage change of the real effective exchange rate (R_t) is also introduced into the model to address the problem of omitted variable bias. Thus, the study will be preoccupied with estimating the following fundamental regression equations (Bahmani-Oskooee and Wu, 2018; Granger, 1988; Karabulut et al., 2020; Rahman et al., 2020; Sokhanvar et al., 2018):

$$Y_t = ß + \sum_{i=1}^{k} \alpha_i Y_{t-i} + \sum_{j=1}^{k} \phi_i T_{t-j} + \sum_{m=1}^{k} \Omega_i R_{t-m} + \mu_{1t} \quad (1)$$

$$T_t = \partial + \sum_{i=1}^{k} \alpha_i Y_{t-i} + \sum_{j=1}^{k} \phi_i T_{t-j} + \sum_{m=1}^{k} \Omega_i R_{t-m} + \mu_{2t} \quad (2)$$

$$R_t = Ø + \sum_{i=1}^{k} \alpha_i Y_{t-i} + \sum_{j=1}^{k} \phi_i T_{t-j} + \sum_{m=1}^{k} \Omega_i R_{t-m} + \mu_{3t} \quad (3)$$

Where: k = optimal lag; ß, ∂, Ø = intercepts; α_i, ϕ_i, Ω_i = short-run dynamic coefficients; μ_{it} = residuals in the equations. Most scholars rally behind this method because it provides additional insight over and above that provided by a typical lagged linear regression model. Also, the Granger causality approach is considered to be superior to the traditionally lagged regression because in the event that one or more of the employed dataset is suffering from autocorrelation, lagged regression is susceptible to over-reporting the relationship (McGraw and Barnes, 2018).

Accessibility of Tanzania's international tourism revenue data for the period before 1989 has been the main limitation of this study. To manage the challenge, the authors obtained and utilized the latest available annual data from 1989-2018 to generate the most representative and reliable sample.

4. Findings

4.1. Unit root test

Before subjecting the series to the scientific ADF test, 2 preliminary tests for unit root are carried out: plotting the 3 series and observing their trend, and performing regression for the 3 variables, and observing the value of R-squared and the Durbin-Watson statistic. Figure 1 shows a line graph for Y_t, T_t, and R_t. The three graphs maintain a gradual upward trend; an indication of non-stationarity.

The regression of Y_t on T_t and R_t revealed that R-squared = 0.6379 and Durbin-Watson statistic = 1.7603. This outcome suggests that the series is stationary because the R-squared is less than the D-W statistic. Nevertheless, the ADF test must be performed because the preliminary tests are neither robust nor conclusive.

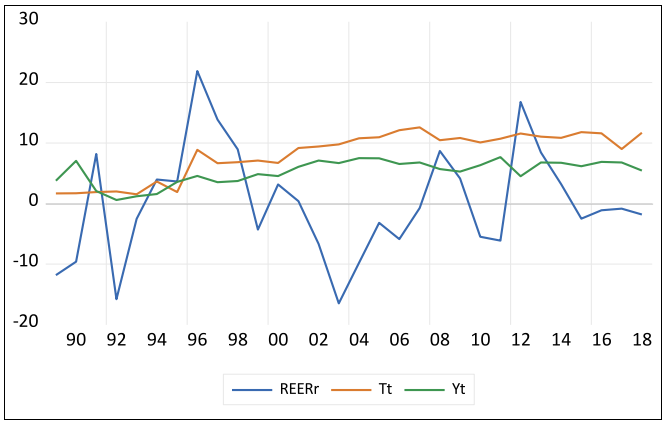

Figure 1. Line graph - GDP growth rate (Y_t), tourism as % of GDP (T_t), and annual percentage change of real effective exchange rate (R_r) over the period 1989 to 2018. Source: Authors' estimation.

4.2. Augmented Dickey-Fuller (ADF) test

Y_t series at the level: When Y_t is tested at level with intercept, the ADF absolute value (2.05) is lower than the critical value at 5% (i.e., 2.998). So, we fail to reject the null hypothesis that Y_t has a unit root. When tested with trend and intercept, the ADF absolute value (1.65) is lower than the critical value at 5% (i.e., 3.62). So, overall, at the level, we fail to reject the null hypothesis that Y_t has a unit root.

When the Y_t series is tested at the first difference with intercept, the ADF absolute value (5.3142) is higher than the critical value at 5% (i.e., 2.9). So, we reject the null hypothesis that Y_t has a unit root at the first difference with intercept. Again, when tested at the first difference with trend and intercept, the ADF absolute value (5.1180) is higher than the critical value at 5% (i.e., 3.58). So, we reject the null hypothesis at the first difference with the trend and intercept. Thus, overall, we confirm that the Y_t series is stationary at first difference. A similar approach was used to perform the ADF test on the T_t and R_t series. Both series were found to be stationary at first difference. Overall, we affirm that the three series, i.e., Y_t, T_t, and R_r have unit roots, but they all become stationary on the first difference. The ADF results are summarized in Table 1.

4.3. Causality test: Wald coefficients test & pairwise Granger causality test

To carry out the causality test meaningfully, it is important to determine the optimal lag length. First, we identify the appropriate criteria. Akaike information criterion (AIC) and Schwarz criterion (SC) are the most used and recommended criteria in the literature. The VAR estimates extract in Table 2.1 identify the AIC as the most appropriate criteria because it gives us the lowest value. Applying AIC to determine the optimal lag generates the evidence, as depicted in Table 2.2, that 2 is the optimal lag length.

The identified optimal lag length, 2, was used to run the unrestricted VAR and the outcome is presented in Appendix B. These are important results in the study and they will be subjected to the Wald coefficient test and pairwise Granger causality test to establish if the causal relationship among the variables can be inferred and if any, to establish its direction.

The Wald coefficient test will essentially confirm if a coefficient in the model is statistically significant or not (Behar, 2010; Smale et al., 2016). Based on the *Unrestricted VAR Estimate* (Appendix B), we estimated Wald Coefficients and the results are presented in Appendix C.

4.3.1. Specification of parsimonious VAR model

Since not all coefficients on appendix C are significant, it is necessary to run hypothesis testing to establish which variables have affected the dependent variable of each model. The non-significance of some

Table 1. ADF Unit root test results.

Null Hypothesis: $D(Y_t)$ has a unit root				Null Hypothesis: $D(T_t)$ has a unit root		Null Hypothesis: $D(R_t)$ has a unit root	
		t-Statistic	Prob.*	t-Statistic	Prob.*	t-Statistic	Prob.*
ADF test statistic		-5.314201	0.0002	-8.741065	0.0000	-3.046699	0.0441
Test critical values:	1% level	-3.699871		-3.689194		-3.724070	
	5% level	-2.976263		-2.971853		-2.986225	
	10% level	-2.627420		-2.625121		-2.632604	

* MacKinnon (1996) one-sided p-values.

coefficients may be due to having excess lags or due to specifications error. So, we specify a parsimonious VAR model with the aid of the Wald test and re-estimate it.

Eliminating the non-significant coefficients on the results in Appendix C and carry out a Wald test with null hypothesis (H_o): C(3) = C(7) = C(11) = C(14) = C(16) = C(19) = C(21) = 0, we obtain the results in Appendix D.

Since the results in appendix D affirm that C(16), C(19), and C(21) are not significant, we eliminate them and remain with a Parsimonious VAR Model as presented by Eqs. (4) and (5).

$$Y_t = C(3)*T_t(-1) + C(7) \quad (4)$$

$$T_t = C(11)*T_t(-2) + C(14) \quad (5)$$

Running a Wald test on the above Parsimonious model, with H_o: C(3) = C(7) = C(11) = C(14), we find that all coefficients are statistically significant as shown in Table 3 i.e. Parsimonious VAR Results.

The Parsimonious VAR model results, Table 3, can now be interpreted as follows: C(3) is the coefficient of $T_t(-1)$, with a value of 0.383051 and p-value of 0.0000. It has a significant effect on Y_t. This means that a past period unit change independent variable (T_t) will on average lead to a 0.38 unit increase in the current annual value of the dependent variable (Y_t). In this case, due to the positive sign of C(3), changes in the tourism sector have expanding effects on the GDP. Likewise, C(11) is the coefficient of $T_t(-2)$ with a value of 0.800431 and a p-value of 0.0000; and so, it has a significant effect on the dependent variable T_t. Thus, a unit increase in the second lag value of tourism revenue, T_t (-2), will lead to a 0.8 increase in T_t. C(7) and C(14) are constant terms and they are both significant.

4.3.2. *Wald coefficients diagnostic test and pairwise Granger causality test*

To infer causality at a 5% level, the coefficients of interest are C(3) and C(11). To establish if these coefficients have a causal effect, we performed the Wald coefficient diagnostic test and the results are summarized on the left side column of Table 4. In line with Wald test results, we reject the null hypothesis that the coefficients are not statistically different from zero because the p-values of the Chi^2-statistics (i.e., 0.0000) is less than the critical value 0.05. Thus, C(3) and C(11) have a significant causal effect with the respective dependent variables. Overall, therefore, for estimated coefficient of C(3), we conclude that tourism growth causes economic growth. This findings are in line with the findings of Dritsakis (2012); Hye and Khan (2013); Katircioğlu (2010); Mérida and Golpe (2016); Payne and Mervar (2010); Ribeiro and Wang (2019); Shahzad et al. (2017); Tang and Abosedra (2014); Tang and Tan (2015). Likewise, for C(11) we conclude that the lag values of tourism revenue have a significant impact on the current value of tourism revenue. As a way of validating the Wald coefficient test results, confirm its robustness and define the direction of causality between T_t and Y_t, we performed the Pairwise Granger causality test, and the results are summarized in the right-side column of Table 4.

Since the p-value (0.0007) is less than 0.05, we can reject the null hypothesis that T_t does not Granger Cause Y_t, and thus conclude that T_t Granger Cause Y_t. Nevertheless, we fail to reject the hypothesis that Y_t does not Granger Cause T_t for its corresponding p-value is not significant at 0.05 significant level. And so, Y_t does not cause T_t. Overall, therefore, there is a unidirectional causality from T_t to Y_t. This finding is consistent with the findings of Dritsakis (2012); Hye and Khan (2013); Katircioğlu (2010); Mérida and Golpe (2016); Payne and Mervar (2010); Ribeiro and Wang (2019); Shahzad et al. (2017); Tang and Abosedra (2014); Tang and Tan (2015) but opposed to the findings of Ahiawodzi (2013); Kadir et al. (2011); Nene and Taivan (2017); Suryandaru (2020) which confirm reverse hypothesis. Further, some diagnostic tests, i.e., autocorrelation and normality tests were carried out to check the reliability of the causality tests. The results are summarized in Appendix E; they are consistent with the causality test results in Table 4.

To further assess the tendencies of the significant Granger causality results, we estimate the Impulse Response Function (IRF). The IRF is applied to generate some information which the Granger causality could not provide: it will give us an insight into the length of time that is necessary for the causal effect to take place and also the qualitative nature of the relationship; it traces the impact of shocks for several periods in the future on the dependent variable (Sethi et al., 2019). The IRF results are depicted in Figure 2.

Figure 2 shows the response of Y_t to a one standard deviation shock to T_t. The middle line represents IRF while the upper and lower lines are

Table 2.1. VAR estimate.

Determinant resid covariance (dof adj.)	103.4687
Determinant resid covariance	43.65087
Log likelihood	-172.0580
Akaike information criterion (AIC)	13.78985
Schwarz criterion (SC)	14.78901

Table 2.2. VAR lag order selection criteria.

Endogenous variables: Y_t, T_t, and R_t

Included observations: 28

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-211.1423	NA	882.1300	15.29588	15.43862	15.33952
1	-185.4421	44.05752	269.1527	14.10301	14.67395*	14.27755
2	-172.0580	20.07620*	202.0874*	13.78985*	14.78901	14.09531*

* Indicates lag order selected by the criterion.

Table 3. Parsimonious VAR model results.

	Coefficient	Std. Error	t-Statistic	Prob.
C(3)	0.383051	0.069998	5.472328	0.0000
C(7)	2.215522	0.620390	3.571177	0.0008
C(11)	0.800431	0.080815	9.904456	0.0000
C(14)	2.217329	0.715865	3.097412	0.0031
Determinant residual covariance: 4.051580		80		
Equation: $Y_t = C(3)*T_t(-1) + C(7)$				
Observations: 29				
R-squared	0.525870	Mean dependent var		5.295243
Adjusted R-squared	0.508309	S.D. dependent var		2.005038
S.E. of regression	1.405945	Sum squared resid		53.37043
Durbin-Watson stat	1.390974			
Equation: $T_t = C(11)*T_t(-2) + C(14)$				
Observations: 28				
R-squared	0.790489	Mean dependent var		8.625321
Adjusted R-squared	0.782430	S.D. dependent var		3.475868
S.E. of regression	1.621296	Sum squared resid		68.34361
Durbin-Watson stat	1.657705			

Source: Authors' estimations

95% confidence interval. The estimated IRF lies within the 95% critical bounds as expected. The response on Y_t, captured by the IRF, can be interpreted as follows: a one standard deviation shock (innovation) to T_t initially leads to an increase in Y_t in period 1 and part of period 2. Then, about the middle of the 2nd period to slightly over the middle of the 3rd period, the shock to T_t leads to no significant increase in Y_t. From the mid of the 3rd period onward, the shock to T_t leads to a gradual decline in Y_t and remains in the positive region. In sum, the IRF shows that shocks to T_t will have a positive impact on Y_t both in the short run and in the long run.

The IRF outcome is consistent with economic theory and intuitions: increasing tourism activities have a positive impact on economic growth, of which the impact of the shock tends to disappear gradually beyond the 3rd period. This means that as income increases, people tend to spend more though the proportion of income spent on a particular commodity or service tends to decline with increasing income. For instance, the absolute amount of income spent on leisure tourism may increase as income increases but its proportion tends to decline as income increases.

5. Conclusion and policy implications

This research focused on assessing the causal relationship between tourism expansion and economic growth in Tanzania over the period 1983–2018. Unlike the study by Odhiambo (2011) which confirmed the feedback hypothesis in the short run and reverse hypothesis, in the long run, our empirical findings confirm tourism led-growth i.e., growth hypothesis. The apparent difference in the findings of these two studies is largely because Odhiambo's study used dollar value for real GDP and international tourism receipts, thereby rendering them inappropriate proxies and therefore led to an erroneous conclusion. The appropriate approach is to use the proportion (percentage) of tourism receipts to GDP and the growth rate of GDP. As discussed above, selecting inappropriate proxies can lead to a spurious regression result. Therefore, it is always crucial to carefully select appropriate variables and in a suitable form before embarking on a study and use the findings as a basis for policy formulation.

The existence of unidirectional causality from tourism expansion to economic growth implies that Tanzania can effectively boost her economic growth by enacting and implementing economic policies that promote tourism expansion. In this case, tourism is of crucial importance for economic development and livelihood improvement in Tanzania. It follows, therefore, that strategies to subsidize the tourism sector will in turn empower the overall country's economy. Tanzania may increase its tourism income by making concerted efforts to improve its infrastructures (especially transport and hospitality); set strategies to improve the quality of Tanzanian tourism products to meet international standards and aggressively endeavor to market such products in the target markets; and embrace domestic policies which lower the cost of living, improve the exchange rate, sustain political stability and discourage unnecessary bureaucratic travel and tourism procedures.

The findings also imply that to ensure increased and sustainable tourism revenue, Tanzania need to promote private investments especially in hotels and resorts alongside the on-going government infrastructure development geared to open new tourism destinations in the country. Besides, the unique marketing approach of targeting tourism market segment, which is less affected by financial and economic shocks, which has enabled the country to attain a high-value, low-density (HVLD) tourist destination status must be sustained and enhanced. The HVLD policy exhibit great potential of meeting the needs of the current tourists and destination while at the same time protecting and enhancing the future tourism needs thereby making tourism growth sustainable. The HVLD approach is consistent with the International Labour Organization's pillars of sustainable tourism i.e., social justice, economic development, and environmental integrity.

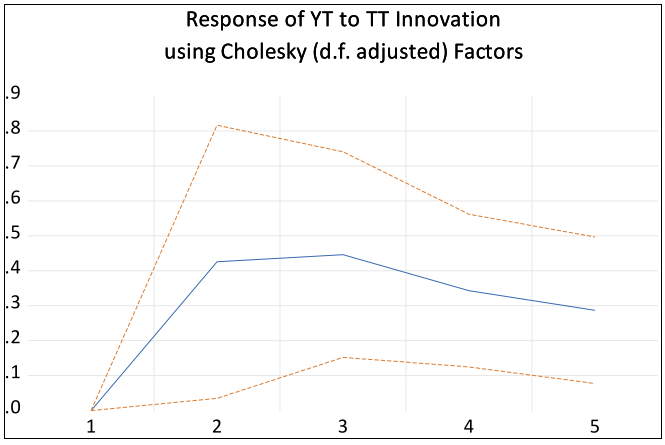

Figure 2. Impulse Response Function. Source: Authors' estimation.

Table 4. Wald Coefficients diagnostic and Pairwise Granger Causality tests results.

Wald test coefficients diagnostic results				Pairwise Granger Causality Tests			
Test Statistic	Value	Df	Probability	Lags: 2			
Chi-square	94.54659	3	0.0000	Null Hypothesis:	Obs	F-Statistic	Prob.
Null Hypothesis: C(3) = C(7) = C(11) = C(14) Null Hypothesis Summary:				T_t does not Granger Cause Y_t	28	10.2651	0.0007
Normalized Restriction (= 0)		Value	Std. Err.				
C(3)–C(14)		-1.834277	0.719279	YT does not Granger Cause T_t		0.96535	0.3958
C(7)–C(14)		-0.001807	0.947284				
C(11)–C(14)		-1.416898	0.789662				

Source: Authors' estimation

The current study is based on countrywide tourism aggregate data on tourism international receipts. Thus, the findings are limited because they do not specifically tell us the contribution of each region (e.g., Coastal region, Zanzibar Iceland, etc.) and the contribution of each tourism sub-sector (e.g., wildlife, hotels and hospitality, cultural tourism, etc.) to the economy. Disaggregate data are difficult to access due to the poorly developed data collection in the country. Nevertheless, our findings which are based on aggregate data are quite robust and reliable for countrywide tourism-growth related policy formulation.

In the future, researchers on this area may consider the use of panel data to bring together e.g., the Southern African Development Community (SADC) and compare the sectoral income-tourism relationship at the regional level, taking into consideration the most recent economic reforms in the region and how they affect sectoral performance for each country.

Declarations

Author contribution statement

V.C. Kyara: Conceived and designed the analysis; Analyzed and interpreted the data and tools; Wrote the paper.

M.M. Rahman: Analyzed and interpreted the data; Wrote the paper. R. Khanam: Analyzed and interpreted the data; Wrote the paper.

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Data availability statement

Data associated with this study has been deposited online at: (1) The percentage contribution of tourism to GDP were obtained from the United Nations Economic Commission for Africa database (The ECA statistical data portal (n.d.). Retrieved 11 January 2021, from https://ecastats.uneca.org/data/browsebyIndicator.aspx). (2) The data for the annual GDP growth rate and the real effective exchange rate were extracted from the World Bank Open data (World Bank Open Data | Data. (n.d.). Retrieved 12 January 2021, from <https://data.worldbank.org/>), and the Bruegel publications database (Real effective exchange rates; Retrieved 12 January 2021, from <https://www.bruegel.org/2012/03/real-effective-exchange-rates-for-178-countries-a-new-database/>)

Declaration of interests statement

The authors declare no conflict of interest.

Additional information

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