# Tourism Services Exports and Economic Growth in Barbados

Lorde, Troy and Francis, Brian and Drakes, Lisa

The University of the West Indies, Cave Hill Campus

3 March 2009

# Tourism Services Exports and Economic Growth in Barbados

Troy Lorde[a, *], Brian Francis[a] and Lisa Drakes[b]

[a]Department of Economics, University of the West Indies, Cave Hill Campus, Barbados
[b]Research Department, Central Bank of Barbados

## Abstract

This paper investigated the relationship between tourism and economic growth in Barbados from 1974-2004 using the techniques of multivariate cointegration, causality testing and innovation accounting. Findings reveal the existence of a long-run relationship between tourist activity and economic growth. However, the nature of the directional relationship and the importance of the real exchange rate as an important determinant appear to be dependent on how output is specified and the statistical techniques employed. Still, our results provide justification for the Government of Barbados' objective of investing in its tourism industry as a means of stimulating growth over the long term. As there is an indication that forward and backward linkages are not as fully developed as they could be, initiatives should also be put in place to foster stronger linkages between the tourism industry and other sectors, such as agriculture, food and beverage, and transportation. It is recommended though that policymakers do not over-rely on tourism for economic growth and that they pay greater attention to other industries given the tourism industry's capricious nature.

***Key Words*:** tourism-led growth hypothesis; Barbados; multivariate cointegration; causality; innovation accounting

***JEL***: C32; F43

**Shortened Title: Tourism Services Exports and Economic Growth**

[*] **Corresponding author**: Troy Lorde, Department of Economics, University of the West Indies, Cave Hill Campus, P.O. Box 64, Bridgetown, Barbados. Tel.: (246) 417-4279; Fax: (246) 438-9104; Email addresses: troy.lorde@cavehill.uwi.edu.

## 1. Introduction

Recently, the export-led growth hypothesis—which posits that exports can serve as an engine of economic growth—has been extended to include tourism services exports. The so-called tourism-led growth hypothesis suggests that the development of a country's tourism industry will eventually lead to higher economic growth and, by extension, further economic development, via spillovers and other multiplier effects. In contrast to the large body of literature on export-led growth (for example, Hossain and Karunaratne 2004; Cardoso and Soukiazis, 2008), however, much research has not focused on the tourism-led growth hypothesis. Therefore, the goal of this study is to provide new evidence on this interesting and growing body of literature by empirically investigating the relationship between tourism and economic growth in the small, open, English-speaking Caribbean economy of Barbados within a multivariate cointegration framework.

Tourism forms the major plank upon which Barbados aims to achieve significant economic growth. A document entitled *Green Paper on the Sustainable Development of Tourism in Barbados* published by the Barbados Ministry of Tourism in 2001 outlines the political administration's vision of transforming the country "into a high quality export service economy, with a fully developed tourism and hospitality industry as its chief engine of growth." To this end, the Government of Barbados has invested significantly in the tourism industry through marketing, investment in tourism infrastructure and policy initiatives which have allowed investors to reduce the costs of inputs into the industry. Table 1 highlights the contributions from various governmental and public sector bodies. Between 1993 and 2002, total contributions more than doubled. The Barbados Tourism Authority, which has a mandate to plan strategies and programs

to develop the sector and promote Barbados as a preferred tourism destination contributed an average of 85 percent of the overall contribution over this period.

The primary source of Barbados' foreign exchange is tourism (see Table 2). Since 1980, its share of total foreign exchange earnings has hovered around 50 percent. Tourism contributed between 10-12 percent of overall gross domestic product (GDP) since 1974. The industry also employed roughly 10 percent of the workforce over the same period. Moreover, Barbados has consistently ranked among the top seven tourist destinations in the Caribbean. A total of 1.27 million visitors were recorded for the year 2004, with estimated tourism receipts of US$763 million, or three percent of the total US$21.6 billion for the Caribbean region.[1]

Against this backdrop, a quantitative study of the relationship between tourism and economic growth would provide invaluable information for Barbados' tourism policymakers as they map out their specific strategies. Findings will help to clarify the true nature of the relationship between tourism and the economy, specifically, whether Barbados is achieving its growth objectives.

Therefore, the broad objective of the paper is to determine how relevant the tourism sector is for economic growth in Barbados and vice-versa. Within this context, the study seeks specific answers to the following questions: Does tourism lead output? Is tourism led by output? Is there feedback between tourism and output? Is the relationship, if it exists, long-run or short-run? Answers to these questions have policy implications. A finding that there is unidirectional causality from tourism to output suggests that more resources should be channeled towards the

[1] Figures are sourced from the Information Centre of the Caribbean Tourism Organization available online at: http://www.onecaribbean.org/home.

tourism sector in an effort to achieve higher growth rates. If findings show a unidirectional causal relationship from output to tourism, then the approach should be to stimulate growth in other sectors of the economy with the intention that overall economic growth will in turn lead to expansion in the tourism industry. If the causal relationship is bidirectional, then a reciprocal thrust on both sides should be adopted. Finally, knowing whether the relationship, if it exists, is long-run or short-run can provide policymakers with insights into how to position and reposition the country's tourism product over time.

The remainder of this paper is structured as follows. Section 2 discusses the relationship between tourism and national output. First, it provides an overview of import substitution and export-oriented strategies as a basis for understanding the rationale behind development strategies based on tourism services exports. Second, it describes the costs and benefits associated with tourism exports. Third it briefly reviews recent empirical studies on the link between tourism and economic growth. Section 3 describes the data and econometric methods used in the study. Section 4 presents the results and analysis. Section 5 concludes.

## 2. Literature Review

*Rationale for Development Strategies Based on Tourism*

In the 1950s and 1960s, many Lesser Developed Countries (LDCs) pursued the inward-looking policies of import substitution industrialization (ISI) in varying degrees and intensities, particularly in the light manufacturing sector, in order to achieve economic growth. Besides economic growth, it was the view that expansion of the light manufacturing sector would result in higher rates of labor absorption. Additionally, it was expected that ISI would ease the balance of payments

problems which most LDCs faced by increasing the availability of foreign exchange to be used for capital projects.

However, from the mid-1970s, there was a considerable shift towards export-led development strategies as many LDCs did not experience the economic success envisioned under ISI. This shift was also spurred by the "Washington Consensus" which advocated such an approach (Taylor, 2003). Under the export-based approach, it was expected that the expansion of exports would lead to better resource allocation, economies of scale and production efficiency through technological development and an enlarged market, capital formation, employment creation, and hence economic growth (Ram, 1987). In addition, it would earn needed foreign exchange.

The export-led approach was met with some success by the Southeast Asian "Tigers"—Hong Kong, Singapore, South Korea and Taiwan. However, according to Griffith (1987), many LDCs were not able to replicate the performance of the "Tigers". While the manufacturing sectors of some LDCs expanded, many still experienced high unemployment rates (Baer and Samuelson, 1981).

Over the last three decades, many economies around the world have become more service-oriented. The issue of whether services-exports could serve as a vehicle for economic growth and development was raised by Shelp (1982). The key question was: Do some countries have a comparative advantage in services which could be used for achieving economic development? A service industry in which LDCs were thought to hold such an advantage was tourism, due in part to their climates, geography and cultural attractions. Brownrigg and Greig (1975) suggest that

tourism should be considered an export industry which has the potential to diversify economies. Mckee (1988) sounds a note of caution, however. He states that tourism is "a fair weather activity subject to immediate difficulties from negative influences both foreign and domestic." Whether a country should focus on tourism services exports as a vehicle for its overall developmental goals should be examined on a case by case basis; that is, the choice should be based on the costs and benefits.

*Economic Costs and Benefits of Tourism*

The United Nations World Tourism Organization (UNWTO) indicates that tourism currently represents around 35 percent of the world's exports of services and over 70 percent in LDCs. International tourism receipts were estimated at US$733 billion in 2006. There were 846 million international tourist arrivals worldwide in 2006 and this number is forecasted to reach 1.6 billion international tourist arrivals by 2020.[2] Despite such impressive statistics, the costs and benefits of tourism services exports must be considered when discussing the relationship between tourism and economic growth (Sinclair, 1998).

Tourism has the potential to generate significant amounts of foreign exchange, which is vital for the purchase of imported raw materials for capital development, and the financing of consumption goods. Airey (1978) discusses two opposing effects which tourism has on the balance of payments that are relevant to LDCs. On one hand, there is the inflow of foreign exchange spent by tourists within the domestic economy. On the other hand, policies designed to increase the number of

[2] Further facts and figures can be accessed online at: http://unwto.org/facts/menu.html

visitors and their level of spending, such as overseas marketing activities, imported goods to satisfy foreign tastes, and commissions to travel agents, lead to an outflow of foreign exchange.

The level of income is expected to be positively impacted by tourism. Direct effects are caused by original tourist expenditures while secondary effects occur in the other sectors of the economy through multiplier effects. Omission of any leakages would overestimate the impact of these expenditures. Archer (1977) indicates that leakages could even occur in original expenditures. Expenditures by tourists may also affect local consumption patterns (the so-called demonstration effect) which can lead to inflation (Lee and Chang, 2008). Monopoly power may also arise due to demand for foreign goods resulting in welfare loss (Balaguer and Cantavella-Jorda, 2002).

Palmer (1979) highlights the labor-intensive nature of tourism, which leads to higher employment and consequently further economic stimulus through the spending of workers. Moreover, tourism lends itself to the employment of low-skilled labor (Culpan, 1987), women (Cukier-Snow and Wall, 1993) and students and young adults (Mathieson and Wall, 1982) who typically have higher unemployment rates than other segments of the labor force. Tourism may also impact employment in the construction and agricultural sectors. However, these impacts are not always positive. The negative impact in the construction sector arises from possibly lengthy unemployment durations when construction projects are completed. According to LaFlamme (1979), employment and output in agriculture can be adversely affected if there is a shift in the preference of local people towards imported food items. The seasonal nature of tourism also means that some jobs will disappear for months at a time. Finally, many tourism jobs are often part-time and may be filled by people taking a second job, resulting in a fuller utilization of those already employed, which

naturally means there would be no appreciable decreases in unemployment levels (Mathieson and Wall, 1982).

Tourism is a source of revenues for governments. Revenues can be gained from sales and hotel room taxes. Other sources include customs duties, disembarkation and departure taxes, and port development taxes. Government employment may also be stimulated. If there is growth in tourist arrivals, more employment may be generated in customs and immigration, as well as for security and maintenance of air and seaports which may be government-owned, particularly in the case of LDCs. However, the costs of wages and administration must be balanced against the benefits from revenue and employment generation.

Hosein and Tewarie (2004) highlight some other drawbacks of focusing on tourism services exports. It is possible that great emphasis on tourism can deprive other sectors, such as manufacturing, of vital resources, thereby leading to de-industrialization and possible retardation of long-run growth in the economy. The high volatility of the tourism sector, stemming from seasonality of tourist arrivals is another disadvantage often cited. Other costs include increased pollution, congestion and despoilment of the environment (Gursoy and Rutherford, 2004) and crime prevention and control (Dunn and Dunn, 2002).

*Empirical Evidence*

Not much research has been conducted on the tourism-led growth hypothesis (*TLGH*). Only recently has there been a surge in research investigating the link between tourism and economic growth.

Gunduz and Hatemi-J (2005) utilize leveraged bootstrap causality tests to determine the validity of the *TLGH* in Turkey. They find evidence to support the hypothesis. A similar conclusion was found by Balaguer and Cantavella-Jorda (2002), and Cortes-Jimenez and Artis (2005) in separate studies on Spain. Each study finds that tourism leads to economic growth. Cortes-Jimenez and Artis contend that as a result of the development of the tourism industry, there was acceleration in Spain's industrialization process. The increased foreign exchange receipts from tourism were used to purchase imports of capital goods necessary for the production processes of firms in the manufacturing sector. In this way, development of Spain's tourism industry led to the development of other industries in Spain. On the other hand, Oh (2005), who considered the Korean case, finds no evidence to support the *TLGH*, but uncovers a causal relationship from growth to tourism. Eugenio-Martin, et al. (2004) employ generalized least squares (GLS) in a panel framework to investigate the tourism/growth relationship for Latin American countries. Their evidence indicates that tourism causes growth in low and medium income Latin American countries, but not in those with high income.

Studies which seek to determine the nature of the relationship between tourism and economic growth in the Caribbean were undertaken by Hosein and Tewarie (2004) and McDavid (2004). Using correlation coefficients, as well as cumulative experience functions, Hosein and Tewarie find that tourism growth is associated with economic growth in Trinidad and Tobago; however this conclusion was not reached using Granger-causality tests. McDavid conducted a case study of English-speaking Caribbean countries. He points out that although a manufacturing-based economy is preferred to a services-led economy because of relatively higher productivity growth, that modern-day tourism also portrays some of the main aspects of industrialization such as

economies of scale and economies of scope. McDavid argues that as a result of the failure of stagnant agriculture and manufacturing industries to improve the economic situations of Caribbean countries, the tourism industry has surfaced as the engine of growth for Caribbean economies.

In short, various studies have yielded different empirical findings, which naturally lead to different policy implications and development strategies. This may be due to the dissimilarities in tourism development for different countries (Lee and Chang, 2008). Sinclair (1997) also notes that tourism is likely to grow at a faster rate in developing countries and tends to play a major role in the economy of LDCs. Gunduz and Hatemi-J (2005) offer three possible reasons for the differing results. First, they believe that the difference in the importance of tourism to individual countries is one source of conflicting results. Second, they suggest that the contradictory findings may be the result of differing methodologies. Third, the omission of relevant variables may be the issue.[3] Oh (2005) and Balaguer and Cantavella-Jorda (2002) suggest the inclusion of the real exchange rate as a key variable in investigating tourism and economic growth, as a proxy for external competitiveness of the destination.

## 3. Data and Econometric Methodology

The required series to test the *TLGH* for Barbados are obtained from two sources. Observations on long-stay international tourist arrivals (*arr*) to Barbados are used as a measure of tourism activity, and are obtained from the Central Bank of Barbados (CBB) *Annual Statistical Digest*. Real GDP (*rgdp*), used to proxy output, is obtained from the same source. We also use real GDP on a per capita basis (*rgdpcap*) as a check on the robustness of our results. Barbados' main tourist

[3] Lutkepohl (1982) highlights the problems caused by omitted variables in bivariate tests, such as incorrect causal inferences.

source markets have historically been the United States (US), the United Kingdom (UK), Canada, and CARICOM;[4] the remaining arrivals, denoted OTHER by the Barbados Statistical Service, come principally from mainland Europe. Consequently, we feel it appropriate to use a proxy for the real exchange rate which reflects the diverse composition of tourist arrivals to Barbados. Therefore, special drawing rights (SDR), which is based on a basket of currencies including three of Barbados' main source markets, is used to proxy the real exchange rate. The series—BBD per SDR—is obtained online from the International Monetary Fund (IMF) *International Financial Statistics*. All data are quarterly and run from the first quarter of 1974 to the fourth quarter of 2004, a total of 31 years, or 124 observations. Due to the highly seasonal nature of tourist arrivals to Barbados, seasonal dummies are also employed; dummies are constructed for the second (Q2), third (Q3) and fourth (Q4) quarters respectively. All series are logged for estimation purposes.

To test for the presence of a long-run relationship, the maximum likelihood method developed by Johansen (1988) and Johansen and Juselius (1990) is utilized. Johansen and Juselius propose two test statistics for testing the number of cointegrating vectors: the trace and the maximum eigenvalue statistics. The Schwarz Information Criterion (SIC) will be used to select the number of lags required in the cointegration test.

A necessary precondition to testing for cointegration is to inspect the unit root properties of the variables under consideration. In this study, several unit roots are employed. First, we utilize the

[4] CARICOM stands for Caribbean Community. There are 15 full members: Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, St. Kitts and Nevis, St. Lucia, St. Vincent and Grenadines, Suriname and Trinidad and Tobago. Associate members are Anguilla, Bermuda, British Virgin Islands, Cayman Islands and Turks and Caicos Islands.

conventional Dickey-Fuller (DF)/Augmented Dickey-Fuller (ADF) test by Dickey and Fuller (1979, 1981); and the KPSS test by Kwiatkowski et al. (1992). Insignificant ADF and significant KPSS statistics respectively indicate the presence of a unit root. Since standard unit root tests have reduced power if they are applied to a time series with one or more structural breaks, we also employ the two-break unit root test by Lumsdaine and Papell (1997) which allows for the possibility of two structural breaks in a time series and is denoted LP. Failure to reject the null provides evidence of a unit root in the series. Critical values can also be found in Lumsdaine and Papell (1997).

To examine whether a short-run relationship exists, the Granger-causality test developed in the seminal paper of Granger (1969) will be employed. Basically, this test seeks to ascertain whether or not the inclusion of past values of a variable $x$ do or do not help in the prediction of present values of another variable $y$. If variable $y$ is better predicted by including past values of $x$ than by not including them, then, $x$ is said to Granger-cause $y$.

Innovation accounting is used to determine the dynamic responses of the variables. Variance decomposition provides information concerning the relative importance of each innovation towards explaining the behavior of endogenous variables. In this study, variance decomposition is used to answer the questions: How much of the variance in the forecast error of future national output can be attributed to innovations in tourism activity; and conversely, how much of the variance in forecast error of future tourism activity can be attributed to innovations in national output? If, for example, output's response to an innovation to tourism activity is larger than its response to its own innovation while tourism activity's response to an innovation to national output

is smaller than its response to its own innovation, this is evidence in support of the *TLGH*. If the reverse holds, then this is evidence in support of the hypothesis that national output drives expansion in the tourism industry. If the responses of national output and tourism activity to each other's innovations are equal, this would suggest that there is feedback between the two variables.

Impulse response functions are used to trace how national output e and tourism activity respond over time to their own shocks and shocks to each other. If income shows a stronger and/or longer reaction to a shock in tourism activity than to a shock to itself, this is support for the *TLGH*. Similarly, if tourism activity exhibits a stronger and/or longer reaction to a shock in output than to its own shock, this would be support for the hypothesis that output leads tourism. However, if the responses of output and tourism activity to a each other's shock are equal in magnitude and last for equal lengths of time, this would be evidence of a feedback relationship. We employ the generalized forecast error–variance decomposition technique of Koop et al. (1996) and Pesaran and Shin (1998) to determine the relationship between the variables. The generalized approach is different from the standard approach in that the generalized results are indifferent to the ordering of the variables in the vector autoregression (VAR).

## 4. Empirical Results and Analysis

*Long-run Results*

Table 3 presents the results of the ADF, KPSS and LP tests. Each test provides strong evidence that each variable follows a unit root process. Note that the LP test indicates the presence of two structural breaks in each series, a result to which we return later. Thus cointegration is an appropriate methodological framework for analyzing the tourism/national output relationship.

Results from the Johansen cointegration test are provided in Table 4 for the cases when real GDP (Panel A) and real GDP per capita (Panel B) are employed respectively. The trace test and the maximum eigenvalue test each indicate that there is at most one cointegrating vector for each specification, suggesting the existence of a long-run relationship between output and tourist arrivals. Vector error-correction models (VECMs) are thus constructed to undertake the remainder of the analysis.

Long-run results for both models shown in Table 5 indicate that increases in tourist arrivals on an aggregate and per capita basis are positively associated with increases in output in Barbados; that is, the elasticity of tourism activity with respect to output varies between 1.6-1.8. In Panel (A), the error correction terms in both the output and arrivals vectors are significant, suggesting that there is feedback between the two variables in the long run. On an aggregate output basis the real exchange rate has no influence. In contrast when real GDP per capita is the measure of output (Panel B), the real exchange rate has a significant effect in the long run, supporting the findings of Oh (2005) and Balaguer and Cantavella-Jorda (2002). Specifically, it suggests that when the real exchange rate (BBD/SDR) increases by one percent that tourist arrivals rise by 0.7 percent. There

is also a feedback relationship between tourist arrivals and the real exchange rate in the long run, evidenced by the significance of the ECTs for these vectors in Panel (B). Both specifications indicate that adjustment towards long-run equilibrium is relatively high at 20-21 percent each quarter. This provides strong evidence that tourism expansion is responsive to underlying conditions in Barbados.

The seasonal dummies for the second, third and fourth quarters (not reported in Table 5) are highly significant in the output and tourist arrivals vectors for both models. Each is negative implying that the number of tourist arrivals in each of these quarters is smaller in comparison to the number of tourist arrivals in the first quarter (reference quarter). This can be attributed to the fact that the first quarter is the "high season" for arrivals to Barbados, corresponding to the winter season in the United States, the United Kingdom, Canada and mainland European countries.

As it is possible that the structural breaks identified in each series by the LP unit root test could have significant impacts on the stability of our VECMs and may well produce biased results if they are not considered, we test for the stability of our two specifications using the Chow Forecast (CF) test by Chow (1960). The CF tests against the alternative that all coefficients including the residual covariance matrix may vary. It rejects the null hypothesis of constant parameters for large values of the test statistic. We test the stability of the VECMs for each period over the range 1978Q1–2004Q4. The test statistics for each period in the forecast range fail to reject the null of constant parameters; *p*-values range from a low of 0.28 to 1.00 for the model with real GDP; and *p*-values range from a low of 0.51 to 1.00 for the model with real GDP per capita. Accordingly we are satisfied that there are no structural issues in our long-run vectors.

*Short-run Results*

To determine the nature of the short-run relationship between tourism and output, we conduct Granger-causality tests. Rejection of the null indicates that the relevant variable Granger-causes the dependent variable. Table 6 presents the results.

The evidence using aggregate real GDP (Panel (A)) indicates a causal relationship running from real GDP to tourism only; that is, support for the output-led tourism hypothesis. In contrast, when real GDP per capita is employed (Panel (B)), we observe evidence of a bi-directional causal relationship between tourism and output in Barbados. The latter finding is consistent with that attained by Lee and Chang (2008) who also found bidirectional causality between tourism and output.

*Innovation Accounting*

Table 7 shows the forecast error variance decomposition at a 10-steps-ahead forecast horizon. The results do not appear to provide support for the *TLGH*. Panel (A) suggests that an innovation to real GDP explains a greater percentage, even if marginally, of the forecast error variation in tourism activity, than an innovation to tourist arrivals. In contrast, an innovation to real GDP explains a greater percentage of its own future variation. These results suggest that output leads tourism, in agreement with findings in Table 6, Panel (A). In Panel (B), tourist arrivals explain a relatively greater percentage of its own future variation; however, real GDP per capita explains a relatively greater percentage of its future variation in real GDP per capita. In other words, the results from Panel (B) are ambiguous for the direction of the tourism/output relationship.

Panel (A) of Figure 1 depicts the time paths of the responses of real GDP to its own shock a shock to tourist arrivals and a shock to the real exchange rate; and Panel (B) illustrates the response of tourist arrivals due to a shock in real GDP, its own shock and a real exchange rate shock. The evidence from Panel (A) indicates that real GDP has an initial positive response to its own shock that is stronger than to a shock to tourist arrivals; there is a sharp fall-off from quarters one to three; then a leveling-off over the remaining forecast horizon. A shock to tourist arrivals also causes a positive spike in real GDP. In contrast, the magnitude of real GDP's response grows between the first two quarters, eventually surpassing by a small margin the magnitude of the response of real GDP to its own shock, an outcome which is maintained over time. On the other hand, the response of tourist arrivals to its own shock is stronger, both initially and over the long run, than to a shock to real GDP (Panel (B)). Over time (four quarters) though, the difference in the magnitude of the response of tourist arrivals to own and real GDP shocks narrows considerably, an indicator that shocks to both output and tourist arrivals have an almost equal effect on tourism activity in the long run, which is in broad agreement with the result in Panel (A) of Table 7. The real exchange rate has only a marginal impact on real GDP and tourist arrivals, supporting earlier findings for this specification (Table 5, Panel A). Overall, the evidence from Figure 1 lends support to the *TLGH*.

The evidence from Panel (A) in Figure (2) indicates that real GDP per capita has a response that is stronger initially and over time to its own shocks than to shocks to other variables. It is notable that the impulse responses of real GDP per capita fluctuate in a pattern which repeats itself every four quarters over time to its own shocks and shocks to tourist arrivals. Panel (B), on the other

hand, indicates that the response of tourist arrivals is initially stronger and over time to its own shocks than to shocks to other variables. The impulse responses of arrivals to its own and real GDP per capita shocks are shown in Panel (B) are similar in pattern to those described in Panel (A). Both patterns are evidence of the strong seasonality in long-stay arrivals to Barbados. Unlike results from Figure 1, a shock to the real exchange rate has an impact on real GDP per capita and arrivals; its effects are negligible initially but grow steadily over time, consistent with our earlier findings for this specification (Table 5, Panel B). In contrast to the impulse responses in Figure 1, the evidence in Figure 2 does not lend support for the *TLGH* or the reverse hypothesis.

*Implications*

This study examined the tourism-led growth hypothesis (*TLGH*) for Barbados using two proxies (real GDP and real GDP per capita) for national output. Whereas the results for the two specifications are similar for the most part, some significant differences exist. The main difference concerns the significance of the real exchange rate in the long run, when real GDP per capita is the measure of output. The second key difference is that even though the various techniques and specifications employed indicate the existence of a relationship between tourism and output in both the long and short runs, the direction of the relationship is not unambiguous; that is, we find evidence to support the *TLGH*, output-led tourism, and feedback in different instances. These variations in our results, which appear to depend on how output is measured and the statistical technique employed, are in line with the varying results and conclusions found in the literature; that is, the finding or lack thereof, of a relationship between tourism and output may be dependent on factors such as the variables and statistical techniques employed.

Although the result is not robust, the real exchange rate appears to have some effect on tourism activity in Barbados. In other words, the greater the number of Barbados dollars to one foreign currency unit, the greater the number of tourists who visit the country, and vice versa. While value for money is a typical consideration for a potential tourist, in the case of Barbados, our result is in large measure related to the nature of Barbados' tourism product which is considered "high end". In other words, the prices of goods and services are very relevant factors for tourists who plan to visit Barbados.

The lack of a robust bidirectional or feedback relationship between tourism and output in the long or short runs is an indicator that forward and backward linkages are not as fully developed as they could be. The most likely reason is leakages due to imports, as the majority of foreign exchange earned from tourism goes to the purchase of imported goods for consumption. To wit, from 1994-2004 Barbados imports averaged approximately 58 percent of GDP. This limits the magnitude of the multiplier and spillover processes. For the industry to have an even greater impact on economic growth, efforts must be made to reduce the number and size of leakages. This may be accomplished by putting initiatives in place to foster stronger linkages between the tourism industry and other sectors, such as agriculture, food and beverage, and transportation.

Our results to a large extent provide justification for the Government of Barbados' objective of investing in its tourism industry as a means of stimulating growth over the long run. However, it should again be pointed out that tourism is a capricious industry and is influenced to a significant degree by external shocks beyond the control of domestic institutions and organizations. For instance, after 2001, Barbados' tourism industry was temporarily crippled by the effects of the

September 11 terrorist attacks on international air travel. Real output slowed markedly, averaging just 0.6 percent in the four quarters after the attacks. Apart from shocks, there are the regular fluctuations caused by the seasonality in tourism arrivals. As such, a sole or over-reliance on this volatile industry is likely to induce similar volatility in national output and may lead to macroeconomic instability in the long run, as the industry is the country's main foreign exchange earner, and employs a significant percentage of Barbadian residents. While diversification of Barbados' tourism source markets can reduce some of the volatility in output caused by seasonality, it is strongly recommended that policymakers also pay direct greater attention to other sectors in their efforts to stimulate economic growth. Such efforts would also forestall possible macroeconomic instability.

## 5. Conclusion

This paper investigated the nature of the relationship between tourism and economic growth in Barbados, a small, open, English-speaking Caribbean country which has identified strategies for economic growth based on export of services in general, and tourism in particular. To accomplish this, the paper applied the techniques of multivariate cointegration, causality testing and innovation accounting to analyze the relationship between real output and long-stay international tourist arrivals employing quarterly data from 1974-2004. The real exchange rate was also included in the analysis, in accordance with recommendations from previous studies in the literature.

Our findings reveal the existence of a stable long-run relationship between tourism activity and output. However, the nature of the directional relationship and the importance of the real exchange rate as an important determinant appear to be dependent on how output is specified and the

statistical techniques employed. Still, our results provide justification for the Government of Barbados' objective of investing in its tourism industry as a means of stimulating growth over the long term. As there is an indication that forward and backward linkages are not as fully developed as they could be, initiatives should also be put in place to foster stronger linkages between the tourism industry and other sectors, such as agriculture, food and beverage, and transportation. It is recommended that policymakers do not over-rely on the tourism industry and that they pay greater attention to other sectors in their efforts to stimulate economic growth and to forestall possible macroeconomic instability.

**Acknowledgements**

The authors are very grateful to two anonymous referees and the editor for helpful comments on a previous version of this paper.

**References**


Airey, D., (1978), "Tourism and the Balance of Payments," in Alister Mathieson and Geoffrey Wall (eds.), *Tourism: Economic, Physical and Social Impacts*, Essex: Addison Wesley Longman Ltd.

Archer, Brian H., (1977), "Tourism Multipliers: The State of the Art," *Bangor Occasional Papers in Economics No. 11*, Cardiff: University of Wales Press.

Baer, Werner, and Larry Samuelson, (1981), "Toward a Service-Oriented Growth Strategy," *World Development*, 9(6), 499-514.

Balaguer, Jacint, and Manauel Cantavella-Jorda, (2002), "Tourism as a Long-run Economic Growth Factor: The Spanish Case," *Applied Economics*, 34(7), 877-884.

Barbados Ministry of Tourism, (2001), *Green Paper on the Sustainable Development of Tourism in Barbados*, Barbados: Ministry of Tourism.

Brownrigg, M., and M.A. Greig, (1975), "Differential Multipliers for Tourism," *Scottish Journal of Political Economy*, 22(3), 261-275.

Cardoso, Catarina, and Elias Soukiazis, (2008), "Explaining the Uneven Economic Perfomance of the EU Cohesion Countries: An Export-Led Growth Approach," *The International Trade Journal*, 22(2), 156-187.

Central Bank of Barbados (CBB), *Annual Statistical Digest*, Various Issues.

Chow, G., (1960), "Tests of Equality between Sets of Coefficients in Two Linear Regressions," *Econometrica* 20(3), 591-605.

Cortes-Jimenez, Isabel, and Manuel Artis, (2005), "The Role of the Tourism Sector in Economic Development: Lessons from the Spanish Experience," Paper presented at the 45th Congress of the European Regional Science Association.

Cukier-Snow, Judith, and Geoffrey Wall, (1993), "Tourism Employment: Perspectives from Bali," *Tourism Management*, 14(3), 195-201.

Culpan, Refik, (1987), "International Tourism Model for Developing Countries," *Annals of Tourism Research*, 14(4), 541-552.

Dickey, David A., and Wayne A. Fuller, (1979), "Distributions of the Estimators for Autoregressive Time Series with a Unit Root," *Journal of American Statistical Association*, 74(366), 427-431.

Dickey, David A., and Wayne A. Fuller, (1981) "Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root," *Econometrica*, 49(4), 1057-1072.

Dunn, H. and L. Dunn, (2002), *People and Tourism: Issues and Attitudes in the Jamaican Hospitality Industry*, Kingston: Arawak Publications.

Eugenio-Martin, Juan Luis, Noelia Martin Morales, and Riccardo Scarpa, (2004), "Tourism and Economic Growth in Latin American Countries: A Panel Data Approach," *FEEM Working Paper No. 26*, Available Online: http://ssrn.com/abstract=504482

Granger, Clive W.J., (1969), "Investigating Causal Relations by Econometric Models and Cross-spectral Methods," *Econometrica*, 37(3), 424-438.

Griffith, Winston H., (1987), "Can CARICOM Countries Replicate the Singapore Experience," *The Journal of Development Studies*, 24(1), 60-82.

Gunduz, Lokman, and Abdulnasser Hatemi-J, (2005), "Is the Tourism-led Growth Hypothesis Valid for Turkey," *Applied Economic Letters*, 12(8), 499-504.

Gursoy, Dogan, and Denney G. Rutherford, (2004), "Host Attitudes toward Tourism: An Improved Structural Model," *Annals of Tourism Research*, 31(3), 495-516.

Hosein, Roger, and Bhoendradatt Tewarie, (2004), "Service Exports and Economic Growth in an Oil Rich Economy: A case study of Tourism in Trinidad and Tobago," *Journal of Eastern Caribbean Studies*, 29(1), 42-68.

Johansen, Soren, (1988), "Statistical Analysis of Cointegrating Vectors," *Journal of Economic Dynamics and Control*, 12(2-3), 231-254.

Johansen, Soren, and Katerina Juselius, (1990), "Maximum Likelihood Estimation and Inference on Cointegration with Applications to the Demand for Money," *Oxford Bulletin of Economics and Statistics*, 52(2), 169-210.

Koop, G., M.H. Pesaran, and S.M. Potter, (1996), "Impulse Responses Analysis in Nonlinear Multivariate Models," *Journal of Econometrics* 74(1), 119-147.

Kwiatkowski, Denis, Peter C.B. Phillips, Peter Schmidt, and Yongcheol Shin, (1992), "Testing the Null Hypothesis of Stationarity against the Alternative of a Unit Root," *Journal of Econometrics*, 54(1-3), 159-178.

LaFlamme, Alan G., (1979), "The Impact of Tourism: A Case Study of the Bahamas Islands," *Annals of Tourism Research*, 6(2), 137-148.

Lee, Cheien-Chian, and Chun-Ping Chang, (2008), "Tourism Development and Economic Growth: A Closer Look at Panels," *Tourism Management*, 29(1), 180-192.

Lumsdaine, Robin, and David H. Papell, (1997) "Multiple Trend Breaks and the Unit-Root Hypothesis," *The Review of Economics and Statistics*, 79(2), 212-218.

Lutkepohl, Helmut, (1982), "Non-causality Due to Omitted Variables," *Journal of Econometrics*, 19, 367-378.

Mathieson, Alister, and Geoffrey Wall, (1982), *Tourism: Economic, Physical and Social Impacts*, London: Longman.

McDavid, Hilton, (2004), "Service Enterprise Development and Global Competition: A Case for the Development of the Tourism Sector in the Caribbean," *Journal of Eastern Caribbean Studies*, 29(2), 35-49.

McKee, D., (1988), *Growth, Development, and the Service Economy in the Third World*, New York: Praeger.

Hossain, Mohammad A., and Neil Dias Karunaratne, (2004), "Exports and Economic Growth in Bangladesh: Has Manufacturing Exports become a New Engine of Export-Led Growth?" *The International Trade Journal*, 18(4), 303-334.

Oh, Chi-Ok, (2005), "The Contribution of Tourism Development to Economic Growth in the Korean Economy," *Tourism Management*, 26(1), 39-44.

Palmer, Ransford W., (1979), *Caribbean Dependence on the United States Economy*, New York: Praeger.

Pesaran, H.H., and Y. Shin, (1998), "Generalised Impulses Response Analysis in Linear Multivariate Models," *Economics Letters* 58(1), 17-29.

Ram, Rati, (1987), "Exports and Economic Growth in Developing Countries: Evidence from Time-series and Cross-section Data," *Economic Development and Cultural Change*, 36(1), 51-72.

Shelp, Ronald Kent, (1982), *Beyond Industrialization: Ascendancy of the Global Service Economy*, New York: Praeger.

Sinclair, M. Thea, (1997), *The Economics of Tourism*, London: Routledge.

Sinclair, M. Thea, (1998), "Tourism and Economic Development: A Survey," *The Journal of Development Studies*, 34(5), 1-51.

Taylor, Timothy, G, (2003), "Export Diversification in Latin America and the Caribbean," *The International Trade Journal*, 17(2), 101-128.

**Table 1: Investment in Barbados Tourism Industry**

| | Source | | | | | |
|---|---|---|---|---|---|---|
| | Min. of Tourism ($) | BTA ($) | BIDC ($) | CTO ($) | Tourism Development Program ($) | Total Investment ($) |
| 1993-1994 | 967,212 | 29,380,363 | 898,985 | 40,000 | 19,030 | 31,305,590 |
| 1994-1995 | 912,343 | 32,657,860 | 594,074 | 40,000 | 242,094 | 34,446,371 |
| 1995-1996 | 1,069,592 | 35,787,529 | 3,134,918 | 40,000 | 785,730 | 40,817,769 |
| 1996-1997 | 1,451,998 | 42,399,228 | 3,956,375 | 40,000 | 5,438,538 | 53,286,139 |
| 1997-1998 | 1,568,538 | 37,050,000 | 2,719,368 | 40,000 | 5,539,366 | 46,917,272 |
| 1998-1999 | 1,519,803 | 43,364,474 | 1,760,123 | 40,000 | 5,160,378 | 51,844,778 |
| 1999-2000 | 1,960,081 | 42,769,590 | 1,063,612 | 40,000 | 1,749,328 | 47,582,611 |
| 2000-2001 | 4,189,188 | 48,698,000 | 3,364,562 | 40,000 | --- | 56,291,750 |
| 2001-2002 | 2,077,593 | 50,150,138 | 19,056,404 | 52,000 | --- | 71,336,135 |

**Notes**: The data is sourced from the Statistical Department of Barbados. The fiscal year runs from April 1st to March 31st. All figures are in Barbados dollars (BBD). 2 BBD = 1USD. BTA stands for Barbados Tourism Authority; BIDC stands for Barbados Industrial Development Corporation, and CTO stands for Caribbean Tourism Organization. NA means "not available".

**Table 2: Summary Indicators for Barbados Tourism Industry 1974-2004**

| | 1974-1979 | 1980-1989 | 1990-1999 | 2000-2004 |
|---|---|---|---|---|
| GDP (BBD Mn.) | 866.6 | 2,155.5 | 3,250.7 | 4,295.0 |
| Tourism (BBD Mn.) | 89.3 | 237.0 | 399.5 | 497.9 |
| Tourism Share of GDP (%) | 10.3 | 11.0 | 12.3 | 11.6 |
| Tourism Growth (%) | 18.5 | 10.1 | 2.6 | 5.0 |
| Tourism Employment (000 persons) | 8.0 | 7.8 | 11.1 | 13.8 |
| Tourism Share of Overall Employment (%) | 9.3 | 8.5 | 10.1 | 10.6 |
| Foreign Exchange Earnings by Tourism Industry (BBD Mn.) | NA | 738.1 | 1,185.4 | 1,418.0 |
| Tourism Share of Total Foreign Exchange Earnings (%) | NA | 48.0 | 56.1 | 52.1 |

**Notes**: The data is sourced from the Statistical Department of Barbados. All figures are averages for the period indicated.
2 BBD = 1USD. Mn means million. NA means "not available".

**Table 3: Unit Root Tests**

| Variable | ADF | | KPSS | | LP | |
|---|---|---|---|---|---|---|
| | Level | 1st Diff. | Level | 1st Diff. | Level | Breakpoints |
| *Lrgdp* | -1.504 | -4.236*** | 1.201*** | 0.048 | -0.501 | 1978Q3, 1991Q2 |
| *Lrgdpcap* | -3.01 | -4.537*** | 1.036*** | 0.048 | -0.500 | 1978Q3, 1991Q2 |
| *Larr* | -3.117 | -4.939*** | 0.124* | 0.044 | -0.432 | 1983Q1, 1987Q1 |
| *Lrer* | -2.133 | -5.920*** | 0.725** | 0.054 | -0.356 | 1983Q3, 1991Q4 |

**Note**: ***, ** and * indicate significance at the one, five and ten percent levels respectively.

**Table 4: Johansen Cointegration Tests**

| *Panel A: Lrgdp in VAR* | | | |
|---|---|---|---|
| Null Hypothesis | Alternative Hypothesis | Test Statistic | P-Values |
| Trace Test | | | |
| r = 0 | r ≤ 1 | 39.727*** | 0.003 |
| r = 1 | r ≤ 2 | 5.819 | 0..717 |
| r = 2 | r ≤ 3 | 0.930 | 0.335 |
| Max Eigenvalue Test | | | |
| r = 0 | r = 1 | 33.908*** | 0.001 |
| r = 1 | r = 2 | 4.889 | 0.756 |
| r = 2 | r = 3 | 0.930 | 0.335 |
| *Panel B: Lrgdpcap in VAR* | | | |
| Null Hypothesis | Alternative Hypothesis | Test Statistic | P-Values |
| Trace Test | | | |
| r = 0 | r ≤ 1 | 22.992* | 0.072 |
| r = 1 | r ≤ 2 | 7.614 | 0.268 |
| r = 2 | r ≤ 3 | 1.814 | 0.209 |
| Max Eigenvalue Test | | | |
| r = 0 | r = 1 | 15.379* | 0.094 |
| r = 1 | r = 2 | 5.799 | 0.373 |
| r = 2 | r = 3 | 1.814 | 0.209 |

**Note**: ***, ** and * indicate significance at the one, five and ten percent levels respectively.

**Table 5: Lon-run Results**

| | |
|---|---|
| *Panel A: Lrgdp in VECM* | |
| Cointegrating Vector | $Larr_t = 1.788 + 1.790 Lrgdp_t$*** |
| | [27.796] |
| Dependent Variable in VECM | *ECT* |
| Δ *Lrgdp* | 0.184*** |
| | (3.602) |
| Δ *Larr* | -0.211* |
| | (-1.820) |
| Δ *Lrer* | 0.454 |
| | (-0.176) |
| *Panel B: Lrgdpcap in VECM* | |
| Cointegrating Vector | $Larr_t = 1.631 Lrdgpcap_t$** + 0.719 $Lrer_t$** |
| | [4.194] [4.717] |
| Dependent Variable in VECM | *ECT* |
| Δ *Lrgdp* | -0.015 |
| | (-0.399) |
| Δ *Larr* | -0.204** |
| | (-2.478) |
| Δ *Lrer* | 0.109** |
| | (2.683) |

**Notes**: Figures in square parentheses [.] for the cointegrating vectors are chi-square statistics from a test of the restriction that the parameter in question is equal to zero. Figures in circular parentheses are t-statistics. ***, ** and * indicate significance at the one, five and ten percent levels respectively.

**Table 6: Short-run Results**

| *Panel A: Lrgdp in VECM* | | |
|---|---|---|
| Dependent Variable | Null Hypothesis | Wald Statistic |
| *Lrgdp* | *Larr* does not Granger-cause *Lrgdp* | 0.042 |
| | *Lrer* does not Granger-cause *Lrgdp* | 0.349 |
| *Larr* | *Lrgdp* does not Granger-cause *Larr* | 19.854*** |
| | *Lrer* does not Granger-cause *Larr* | 0.309 |
| *Lrer* | *Lrgdp* does not Granger-cause *Lrer* | 0.603 |
| | *Larr* does not Granger-cause *Lrer* | 0.479 |
| *Panel B: Lrgdpcap in VECM* | | |
| Dependent Variable | Null Hypothesis | Wald Statistic |
| *Lrgdpcap* | *Larr* does not Granger-cause *Lrgdpcap* | 17.627*** |
| | *Lrer* does not Granger-cause *Lrgdpcap* | 3.637 |
| *Larr* | *Lrgdpcap* does not Granger-cause *Larr* | 18.512*** |
| | *Lrer* does not Granger-cause *Larr* | 3.240 |
| *Lrer* | *Lrgdpcap* does not Granger-cause *Lrer* | 6.417 |
| | *Larr* does not Granger-cause *Lrer* | 7.306 |

**Note**: ***, ** and * indicate significance at the one, five and ten percent levels respectively.

**Table 7: Variance Decomposition of 10-steps-ahead Forecast Error Variance**

*Panel A: Lrgdp in VECM*

| Response of: | Forecast Error | Percentage of Forecast Error Variance Explained by Innovation in: | | |
|---|---|---|---|---|
| | | *Lrgdp* | *Larr* | *Lrer* |
| *Lrgdp* | 0.085 | 71.349 | 28.441 | 0.210 |
| *Larr* | 0.159 | 50.057 | 49.313 | 0.630 |
| *Lrer* | 0.101 | 6.129 | 0.056 | 93.815 |

*Panel B: Lrgdpcap in VECM*

| Response of: | Forecast Error | Percentage of Forecast Error Variance Explained by Innovation in: | | |
|---|---|---|---|---|
| | | *Lrgdpcap* | *Larr* | *Lrer* |
| *Lrgdpcap* | 0.082 | 87.284 | 7.063 | 5.653 |
| *Larr* | 0.163 | 34.975 | 43.808 | 21.218 |
| *Lrer* | 0.106 | 0.837 | 11.206 | 87.958 |

**Figure 1: Impulse Response Functions for (*Lrgdp*, *Larr*, *Lrer*)**

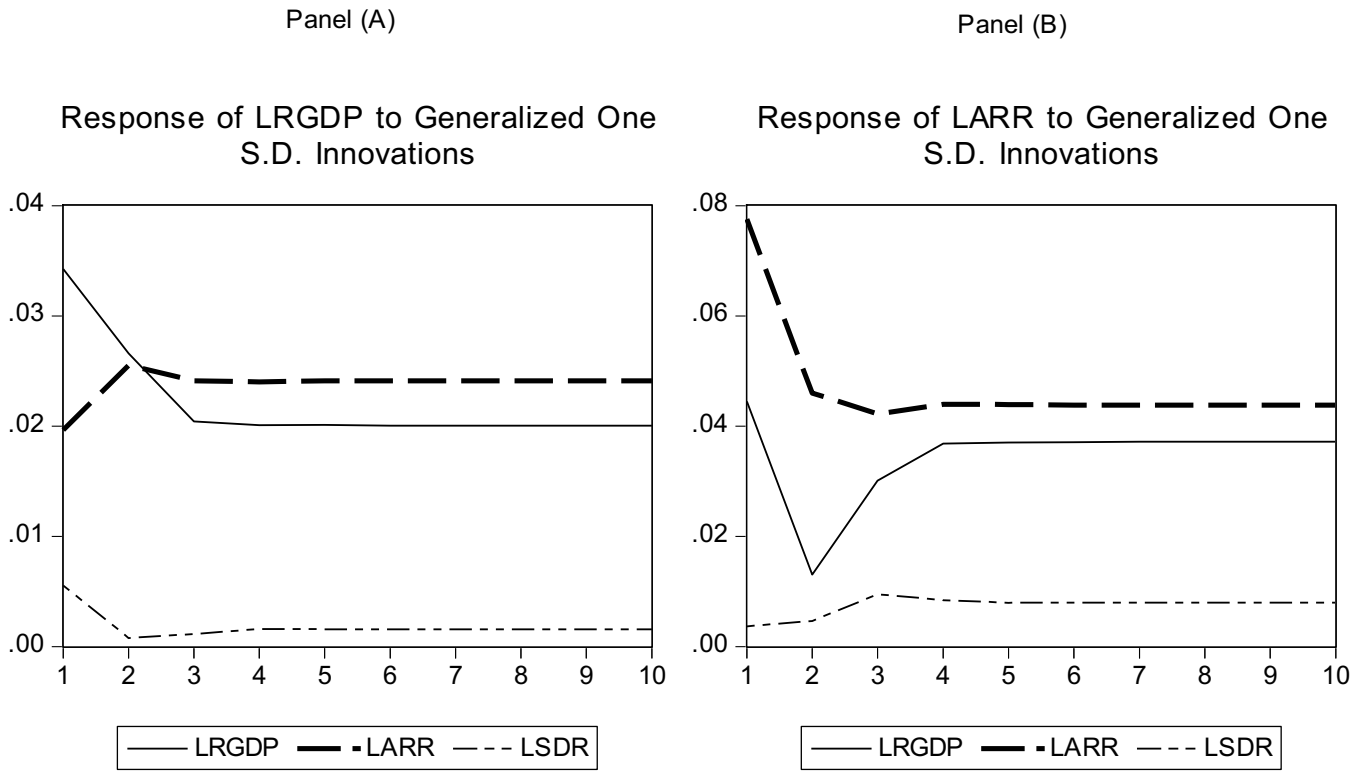

**Figure 2: Impulse Response Functions for (*Lrgdpcap*, *Larr*, *Lrer*)**