

EXAMINATION OF ECONOMIC GROWTH AND TOURISM IN BARBADOS: TESTING THE SUPPLY- SIDE HYPOTHESIS

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The goal of this study is to examine the supply side hypothesis of tourism demand, that is, to answer the question: Does economic growth in Barbados spur tourism growth. Results suggest that there is a long-run relationship between real GDP in Barbados and tourist arrivals. Specifically, we find that a 1% expansion in real GDP is associated with a 1.2% increase in tourist arrivals. Further, our Granger causality test suggests that the supply-side hypothesis is valid for Barbados.

Keywords: *tourism, economic growth, Barbados*

JEL Classification: *L83, M1, O1*

INTRODUCTION

Barbados is a small open economy, located in the Caribbean, northeast of Venezuela. The country has a total area of 431 km² and a population of about 280,000. Barbados has a fixed exchange rate, the Barbadian dollar (BBD) being tied to the United States dollar (USD) at a rate of 2 BBD = 1 USD. In recent years, the economy has diversified into manufacturing, offshore financial services, information services and tourism. Barbados' economy grew at a rate of 2.4 per cent over the 10 years ending in 2006. Barbados has a natural comparative advantage for the development of its tourism industry. Temperatures vary between 20°C and 33°C and there is an abundance of sunshine year-round. Tourism is Barbados' primary source of foreign exchange.

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Since 1980, its share of total foreign exchange earnings has hovered around 50 per cent. Tourism contributed between 10-12 per cent of overall gross domestic product (GDP) since 1974. The industry also employed roughly 10 per cent 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 USD \$763 million, or 3 per cent of the total USD \$21.6 billion for the Caribbean region. However, cost considerations and the constraints imposed by size as well as limited resources have prompted Barbadian policymakers to increasingly focus on a niche-market approach. Strategies have increasingly focussed on embedding tourism in the indigenous culture through heritage and eco-tourism.

The main policy tools by successive Barbadian Governments to develop the various tourism sectors have been favourable incentives and policies geared towards promoting their competitiveness and sustainability. Incentives chiefly take the form of tax concessions for a number of years, including the construction of hotels and duty free imports of some supplies and materials. The Government of Barbados have also directly 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 per cent of the overall contribution over this period. There are also occasions when the Central Bank of Barbados, provides guarantees for the moratoria of repayment of loans by hotels and other tourism businesses to commercial bank intermediaries and other lending institutions, when these businesses are experiencing great financial difficulties caused directly or indirectly by external shocks, such as recessions, natural disasters or incidences of terrorism.

Within this context, the goal of this study is to examine the supply side hypothesis of tourism demand, that is, to answer the question: Does economic growth in Barbados spur tourism growth. An answer to this question has important policy implications. If findings do indeed show a causal relationship from economic growth to tourism growth, then the approach adopted by policymakers should be to stimulate growth in other sectors of the economy so that overall economic growth will in turn lead

to expansion in the tourism industry. Finally, knowing whether the relationship, if it exists, is long-run or short-run can also provide policymakers with further insight into how to position and reposition the country's economy over.

Table 1 Government Investment in Barbados Tourism Industry¹

Fiscal Year	Source					Total Investment
	Min. Tour.	BTA	BIDC	CTO	TDP	
93/94	0.967	29.380	0.899	0.040	0.019	31.306
94/95	0.912	32.657	0.594	0.040	0.242	34.446
95/96	1.070	35.788	3.135	0.040	0.786	40.818
96/97	1.452	42.399	3.956	0.040	5.439	53.286
97/98	1.569	37.050	2.719	0.040	5.539	46.917
98/99	1.520	43.364	1.760	0.040	5.160	51.845
99/00	1.960	42.770	1.064	0.040	1.749	47.583
00/01	4.189	48.698	3.365	0.040	N.A.	56.292
01/02	2.078	50.150	19.056	0.052	N.A.	71.336

The plan of the paper is as follows. Section 2 provides a brief review of the related literature. Section 3 describes the sources of the data and outlines the empirical methodology employed. Section 4 presents the empirical results and analysis. Conclusions are presented in the Section 5.

BRIEF REVIEW OF THE RELATED LITERATURE

The ability of tourism to promote economic growth has been widely recognised in the academic literature (see Mathieson and Wall, 1982; Culpan, 1987; Pearce, 1991; Ige and Odularu, 2008; Çetinel and Yolal, 2009). Tourism often boosts foreign exchange, government revenue (through tax collections) and is an important source of employment, both directly and indirectly. More than this, the multiplier effect of tourism is assumed to boost other sectors of the economy, such as the transportation, agriculture, entertainment and the food and drinks sectors which often service the tourism industry.

Against this backdrop, several countries have opted to incorporate tourism as part of their growth strategy. This, in turn, led to the unfolding of a new line of research: the tourism-led growth (TLG) hypothesis. As in the case of the export-led growth hypothesis, a TLG hypothesis would postulate that tourism Granger-causes economic growth. Balaguer and

Cantavella (2002) were among the first researchers to test the TLG hypothesis. The authors find evidence of unidirectional causality running from tourism to economic growth for Spain and hence conclude that economic growth in Spain has been sensible to persistent expansion of international tourism.

Since the work of Balguer and Cantavella (2002), other researchers have sought to explore the causal relationship between tourism and economic growth (see for instance, Brida et al, (2009, 2010)). While it was initially thought that the direction of causality ran from tourism to higher growth (as shown in the seminal paper by Balaguer and Cantavella-Jorda, 2002), the recent literature suggests that higher growth in the destination might could be the cause of higher levels of tourism (Eugenio-Martin et al, 2008). For instance, investigating the case of Korea, Oh's (2005) Granger causality test imply a one-way causal relationship from economic growth to tourism i.e. the existence of the "supply-side" or "economic-growth driven tourism" hypothesis. Similar results were also attained Narayan (2004) for Fiji. Alternatively, several studies tend to suggest that tourism and economic growth tend to strengthen each other i.e. evidence of bi-directional causality. Among these are Dritsakis (2004) for Greece, Durbarray (2004) for Mauritius, Kim et al. (2006) – Taiwan and Louca (2006) – Cyprus.

Eugenio-Martin et al (2008) note that, while the results of a causal relationship from tourism to economic growth are in line with multiplier theories of tourism, the economic underpinnings of a causal relationship from economic growth to tourism expansion are less clear. As such, Eugenio-Martin et al (2008) note several variables that can contribute to a positive causal relationship from economic growth to tourism. Specifically, the authors note variables which tend to boost arrivals, but also boost growth. Among these are:

- Infrastructure – many tourists expect a minimum level of infrastructure as part of their experience.
- The degree of openness – as a country opens its frontiers and reaches new markets, there is an increase in business travel, which is often a particularly lucrative form of tourism.
- Political Stability – generally, tourists prefer destinations that are politically stable.

Relative prices in some cases can play a key role in determining tourist arrivals. For instance, Nanthakumar et al. (2008) found no causal relation between tourism and real GDP; however, there was bi-directional causality between domestic prices and tourist arrivals.

In what follows, the authors evaluate the impact of economic growth in Barbados on tourism in Barbados. While the importance of tourism to the Barbadian economy is well documented (see for instance Archer, 1984; Jackman and Greenidge, 2010), to the best of the authors' knowledge, no other study explicitly investigates role of economic growth in stimulating tourism demand for Barbados, or any other Caribbean country. Hence, by focusing on Barbados, this paper adds to the rather sparse body of knowledge on the supply-side hypothesis and hopefully, would further empirical evidence and understanding on growth-led tourism nexus in developing countries.

DATA AND ECONOMETRIC APPROACH

The model presented here bears much similarity to that proposed in the Tourism-led growth literature, consisting of economic growth in destination country, tourism activity and a price variable. Total arrivals to Barbados are utilized as a proxy for tourism activity and real gross domestic product is used to measure economic growth. As price indices for tourism related goods and services are not available for Barbados, we use a relative price index calculated as follows:

$$\sum_{i=1}^n w_i \left[\frac{P}{e_i \times P_i} \right] \quad (1)$$

where w_i is the tourist arrival weight for each source market i , e_i is the nominal exchange rate between country i and Barbados, P_i is the consumer price index in country i and P the consumer price index for Barbados. It follows that an increase in this index implies that goods and services are relatively more expensive in the destination country and should be associated with a decline in tourist arrivals.

The database employed in this study consists of quarterly data over the period 1975:1 to 2010:2. Observations on arrivals are taken from the Caribbean Tourism Organization's Annual Statistical Digest while data on RGDP are collected from the Central Bank of Barbados. Data on the nominal exchange rates, consumer price indices for Barbados and its major source markets are obtained from the International Monetary Fund's (IMF) International Financial Statistics. It should be noted that all series have been seasonally adjusted and expressed in natural logarithms.

Econometric approach

As a preliminary step to our analysis, we ascertain the order of integration of the variables using the Phillips-Perron unit root test. If the variables are all non-stationary, it follows to study the existence of a cointegrating relationship. To test for the presence of a long-run relationship, the maximum likelihood method developed by Johansen (1988, 1991) is utilised. Johansen (1991) proposes two test statistics for testing the number of cointegrating vectors: the trace and the maximum eigenvalue statistics. The null hypothesis for the trace test is that there are at most r cointegrating vectors, while for the max eigenvalue test, the null $r = 0$ is tested against the alternative that $r = 1$; $r = 1$ is tested against the alternative $r = 2$; and so forth. The Schwarz Information Criterion (SIC) is used to select the number of lags i required in the cointegration test.

Innovation accounting is used to determine the dynamic responses of the variables. We employ the impulse response function to trace how tourism responds over time to a shock in real GDP and relative prices. Variance decomposition provides information concerning the relative importance of each innovation towards explaining the behaviour of endogenous variables. In a nutshell, the decomposition shows the proportion of forecast error variance in a variable that is explained by innovations to itself and other variables. We use the generalised forecast error variance decomposition technique attributed to Koop et al. (1996) and Pesaran and Shin (1998). The results of this method are not sensitive to the ordering of the variables in the VAR.

Finally, to examine whether any short-run relationships exist, the Granger-causality test developed from the seminal paper of Granger (1969) is utilised. 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 .

EMPIRICAL RESULTS

Table 2 presents the results of the Phillips-Perron unit root test. These suggest that all series are integrated of order 1. Accordingly, tests for cointegration are undertaken.

Table 2 Unit root tests

Variable	Level	Test	1 st Diff.	Test	Decision
Real GDP	-2.848	Trend and Intercept	-11.370***	Intercept	I(1)
Tourist Arrivals	-3.085	Trend and Intercept	-14.723***	Intercept	I(1)
Relative Prices	-1.987	Trend and Intercept	-12.100***	Intercept	I(1)

Notes: *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

The results from the cointegration test are presented in Table 3 below.

Table 3 Unit root tests

Null Hypothesis	Alternative Hypothesis	Test Statistic	P-Value
Trace Test			
$r = 0$	$r \leq 1$	44.58	0.03
$r = 1$	$r \leq 2$	19.78	0.24
$r = 2$	$r \leq 3$	7.73	0.27
Maximum Eigenvalue Test			
$r = 0$	$r = 1$	24.80	0.07
$r = 1$	$r = 2$	12.05	0.41
$r = 2$	$r = 3$	7.73	0.27
Long Run Parameter Estimates (Dependent Variable: Tourism)			
Real GDP	1.217* (2.013)		
Relative Prices	-0.890* (2.702)		

Note: T-statistics in parentheses

Both the trace and maximum eigenvalue test indicate the presence of one cointegrating vector. Thus, there is evidence of a long-run relationship between the variables. Table 3 also presents the

cointegrating equation estimates, which imply that there is a significant positive relationship between tourist arrivals and economic growth in Barbados. In fact, the parameter estimates suggest that a 1% expansion in real GDP is associated with a 1.2% increase in tourist arrivals in the long run. Moreover, an increase in relative prices seems to deter arrivals.

Given the existence of a cointegrating relationship, a dynamic vector error correction model is estimated. Such an undertaking provides the speed of adjustment after the growth rate of real GDP, relative prices and arrivals deviates from long run equilibrium in period $t-1$. With a t -statistic of -2.136, the adjustment coefficient is significant in the tourism equation. The coefficient of -0.048 implies that that on the occasion of a 1 per cent positive deviation from the long-run relationship, tourist arrivals falls by 4.8 per cent each quarter, in order to eliminate the discrepancy. This provides some preliminary evidence that tourism demand is responsive to conditions in the destination country.

Impulse response functions and variance decompositions

In this sub-section, we analyse the impulse response functions and variance decompositions. We are essentially interested in analysing the behaviour of the output and tourism variables. The impulse responses of the variables over a 20-quarter forecast horizon are shown in Figure 1. In line with growth-led tourism hypothesis, the evidence suggests that an unexpected shock to real output leads to a significant jump in tourist arrivals. Furthermore, this positive effect seems to be fairly persistent. Hence, tourism is strongly affected by economic increases in both the short run and long run. Also, an unanticipated increase in relative prices (or an increase in the cost of living in Barbados relative to the source country) is followed by a small decline in arrivals to Barbados. One key observation is that the initial impact is very small, but as the forecast horizon widens, the impact magnifies. This may imply that it takes some time for higher domestic prices to affect tourists.

Table 4 presents the results of the variance decompositions. The estimated suggests also suggest that the future variation of tourism is generally governed by itself and real GDP in Barbados. Specifically, the contribution of output in Barbados to tourism variability ranges between 15% and 24% throughout most of the forecast horizon. This result emphasises the significant role that economic development in destination country plays in volume of arrivals in both the short and long runs; any shocks to the GDP will have a considerable effect tourism development in the country. In contrast, relative prices explain very little of the variation

in tourism in the first 5 quarters (less than 1%) and only reaches about 7% in the 20th quarter. This is consistent with our notion above that in the short-term, tourism is not very responsive to changes in prices, but more-so in the longer term.

Figure 1. Dynamic Effects of Domestic Factors on Tourism

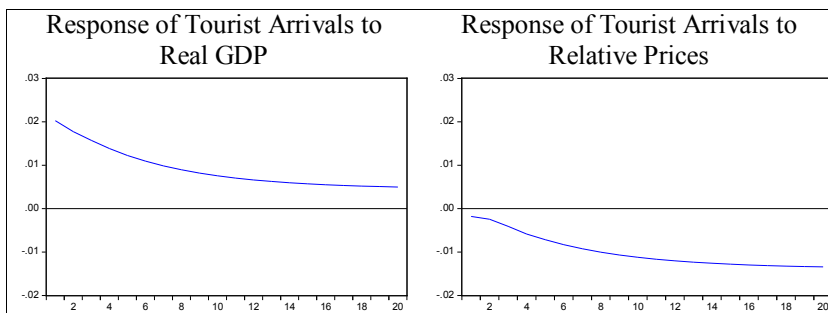


Table 4 Variance Decompositions

Dependent Variable					
	Period	Standard Error	Tourism	Output	Relative Prices
Tourism	1	0.05	81.75	18.25	0.00
	5	0.09	76.67	22.96	0.37
	10	0.12	77.78	19.79	2.43
	15	0.14	78.03	17.13	4.83
	20	0.15	77.20	15.20	6.86

Short-run causality tests

To formally investigate the short-run relationship between tourist arrivals, output and relative prices, Granger-causality tests are conducted within the VECM estimated earlier and results reported in Table 5.

From the F-statistics, the null hypothesis that output does not cause or precede arrivals is clearly rejected and confirms our inferences in section 3.1; that is, economic growth has an insignificant impact on the

growth of the tourism. The Granger causality test also lends further support to the validity of tourism-led growth hypothesis for Barbados, that is, the economic fortunes of the country are closely tied to its tourism industry, thereby justifying Government’s keen tourist-attracting policies. Together, these results imply that prolonged economic growth in Barbados will enhance the growth of tourism in the long run and, due to the backward linkages in the short run, the rise in tourism activity will in turn further boost domestic output. This is consistent with the findings of Dritsakis (2004), Durbarry (2004), Kim et al. (2006) and Louca (2006). However, we could find no evidence to support the notion that relative prices impact the country’s tourism sector, which is in contrast to the work of Nanthakumar et al (2008). But, relative prices does impact real GDP in Barbados. Thus, an indirect price effect can emerge (i.e. through its impact on real GDP).

Table 5 Granger causality tests²

Causality	F-Statistic	P-value
Real GDP \rightarrow Tourism	2.88	0.09
Relative Prices \rightarrow Tourism	0.47	0.49
Tourism \rightarrow Real GDP	3.75	0.05
Relative Prices \rightarrow Output	3.91	0.04

CONCLUDING REMARKS

Whilst most tourism experts acknowledge that the characteristics of the destination country do influence arrivals, the inclusion of supply factors into the tourism demand model is quite rare. Against this backdrop, the aim of this study was to determine if economic growth in Barbados spurs growth in its tourism industry. We find evidence of a long-run relationship between these variables. Specifically, we find that a 1% expansion in real GDP is associated with a 1.2% increase in tourist arrivals. Further, our Granger causality test suggests that the supply-side hypothesis is valid for Barbados. Given the country’s enthusiastic approach to develop the various tourism sectors, i.e. via investment and infrastructure, the evidence in support of the supply-side hypothesis seems justified.

What is particularly interesting is that relative prices appear to have little direct effect on tourism demand in the short term but a significant impact in the long-term. It seems that in the short-term, tourists place more weight to the level of economic development of the country than the price level. This could, in large measure, be related to the nature of the Barbadian tourism product, that is, natural physical attributes (namely sun, sea and sand), various modes of entertainment and friendly people. In other words, since Barbados is not a shopping destination per se, prices of goods and services may be a somewhat irrelevant factor for tourism demand in the short-run. Alternatively, this finding may be due to use of an aggregate price index as a proxy for the cost of tourism in Barbados. The goods and services consumed by tourists may not necessarily be those consumed by the typical local consumer (Witt and Witt, 1995; Lim, 1997) and as a result, given a much smaller weighting in the Barbadian CPI. In other words, it may not fully capture the price effect on tourism demand.

Overall, our findings seem to indicate that economic growth in Barbados plays a significant role in explaining arrivals to this destination. Thus, the approach adopted by policymakers should be to stimulate growth in other sectors of the economy so that overall economic growth will in turn lead to expansion in the tourism industry. Given the backward linkage between tourism and growth, the rise in tourism activity can in turn further boost domestic output.

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ENDNOTES

1. The data is taken from the Statistical Department of Barbados. All figures are in BDS (\$mil). Min. Tour. Stands from Ministry of Tourism; BIDS stands for Barbados Industrial Development Corporation and CTO stands for Caribbean Tourism Organisation. N.A. means “not available”.
2. The notation real GDP \rightarrow tourism represents the null hypothesis: Real GDP does not Granger-cause tourism. A similar interpretation follows for the remaining hypotheses.

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