

**REVISITING THE TOURISM-LED GROWTH HYPOTHESIS FOR BARBADOS:
A DISAGGREGATED MARKET APPROACH**

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Abstract

In testing the tourism-led growth hypothesis, researchers tend to use an aggregate measure of tourism - usually total tourism earnings or tourist arrivals. In contrast, this study adopts a disaggregated market approach to testing this hypothesis. The main advantage of the disaggregated approach is that it provides information on effects of specific tourism markets on growth. Results indicate that while causality from tourism to growth is found for each market over the full sample period (1975Q1 to 2010Q2), but the causal relationships are not stable.

Keywords: Tourism, Growth, Barbados

JEL classifications: F43, L83, Q40

1. Introduction

Tourism has emerged as one of the most beneficial industries in the world. On an international scale, tourism has been recognised as the largest export in trade for many nations. At the country level, tourism has enabled economic restructuring by shifting the labour force from primary sectors such as agriculture and manufacturing to the service sectors. More than this, it serves as an excellent generator of employment, lending itself to the unskilled labour, young people and women who typically have higher rates of unemployment. Against this backdrop, the vast body of literature the impact of tourism on the economy is not surprising.

Among the most popular work on the economic impact of tourism, is the study of the relationship between tourism and economic growth, i.e. tourism-led growth hypothesis (TLG). As in the case of the export-led growth hypothesis, a TLG hypothesis would postulate that an expansion in tourism activity precedes economic growth. Notwithstanding the industry's direct contribution to Gross Domestic Product (GDP), tourism has a chain of possible linkages with other economic sectors which enhances its role in economic growth. In particular, tourism can boost other sectors of the economy, such as the agricultural, construction, transport, communications, entertainment and the food and drink sectors which can help to service the tourism industry.

The first to validate the TLG hypothesis was Balaguer and Cantavella (2002). Their results suggest that tourism is indeed a relevant growth factor for Spain. Since then, several other researchers have sought to explore the causal relationship between tourism and economic growth. In fact, a recent strand of the literature suggests that there may reverse causality – running from growth to tourism. This is known as the growth-led or supply side tourism. A summary of the findings of time series analyses on the TLG hypothesis are presented in Table 1.

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Table 1: Comparison of Time Series Analysis of the TLG Hypothesis¹

<i>Authors</i>	<i>Country</i>	<i>Measure of Tourism</i>	<i>Reported Findings</i>
Balaguer and Cantavella-Jorda (2002)	Spain	Total international tourism earnings	Tourism Growth →
Dritsakis (2004)	Greece	Total international tourism earnings	Tourism Growth ↔
Durbarry (2004)	Mauritius	Total international tourism earnings	Tourism Growth ↔
Narayan (2004)	Fiji	Total international tourism earnings	Growth Tourism →
Gunduz and Hatemi (2005)	Turkey	Total international tourist arrivals	Tourism Growth →
Kim et al. (2006)	Taiwan	Total international tourist arrivals	Tourism Growth ↔
Oh (2005)	Korea	Total international tourism earnings	Growth Tourism →
Ongan and Demiroz (2005)	Turkey	Total international tourism earnings	Tourism Growth ↔
Louca (2006)	Cyprus	Total international tourism earnings	Tourism Growth ↔
Nowak et al. (2007)	Spain	Total international tourism earnings	Tourism Growth ↔
Brida et al. (2008)	Mexico	Total international tourism earnings	Tourism Growth →
Kaplan and Celik (2008)	Turkey	Total international tourism earnings	Tourism Growth →
Katircioglu (2009a)	Malta	Total international tourist arrivals	Tourism Growth ↔
Katircioglu (2009b)	Turkey	Total international tourist arrivals	TLG not valid
Brida et al. (2009)	Colombia	Total international tourism earnings	Tourism Growth →
Brida et al. (2009)	Uruguay	Total international tourism earnings	Tourism Growth →
Risso et al. (2009)	Trentino-Alto Adige	Total international tourism earnings	Tourism Growth →
Jackman and Lorde (2010)	Barbados	Total international tourist arrivals	Tourism Growth ↔

Among the eighteen studies presented in Table 1, eight find evidence of bi-directional causality between tourism and economic growth in the destination country, another eight report unidirectional causality running from tourism to growth, one study finds causality from growth to tourism alone and, finally, one study finds no evidence of a relationship

¹ “Tourism → Growth” denotes causality running from tourism development to economic growth, “Growth → Tourism” denotes causality running from economic growth to tourism development and finally, “Tourism ↔ Growth” denotes bidirectional causality between tourism development and economic growth

between the variables. But, in evaluating this literature, one realises that researchers tend to use an aggregate measure of tourism; usually total tourism earnings or arrivals (see Table 1). Based on this approach, if the TLG hypothesis is found to be valid, one would assume that an increase in tourism activity, irrespective of the origin of the tourists, would boost growth. However, one must bear in mind that these results may be driven by one or just a few markets. Given that the trends, composition and spending patterns of tourist arrivals tend to differ significantly across the various market segments, it seems plausible to assume that their effect on economic growth in the destination country may differ as well. Thus, studies on TLG may suffer from the aggregation bias.

Against this backdrop, the current study seeks to determine whether the TLG hypothesis holds across tourism markets in Barbados – a tourism dependent small island developing state. Indeed, an understanding of the different degrees of responses of the economy to arrivals from each source markets can aid policy makers in effective marketing and economic policy planning. Consider the following scenario. It is well documented that the source market income is one the chief determinants of tourist arrivals. Hence, a negative (and isolated) shock to real GDP in source market *A*, is likely to dampen the tourism demand from country *A*. Provided that arrivals from all other destinations are expected to rise, the next question would be, how concerned should policy makers in tourism specialising states be about the potential decline in visitors from country *A*? i.e. would the decline in arrivals from country *A* have a significant impact on growth in the destination country?

In such a case, the most common step would be to evaluate the size of the relative market to total arrivals and discern the possible impacts. Indeed, works by Gunduz and Hatemi (2005) and Oh (2005) posit that the relative weight of tourism in the economy might be important in whether the TLG hypothesis is verified in any destination country. Following this logic, a decline in the larger source markets would be suspected to have significant impacts on growth, whilst the impact of the smaller markets may be negligible. However, this approach is a bit ad-hoc, and a more rigorous evaluation on the linkages between declines in source market *A* and potential fall-off (or slowdown) in real GDP is needed. As such, this paper employs causality tests to evaluate the relationship between economic growth in Barbados and the arrivals from its main source markets. More than this, the study takes the analysis a step further by evaluating the stability of the relationship in each market. As is well documented, a causal relationship may exist in some time periods and not others. Hence, the rolling sub-sample procedure is incorporated into the causality tests.

The remainder of this paper is structured as follows. Section 2 presents some stylised facts, while section 3 describes the data and econometric methodology employed. Section 4 presents the results of estimations finally, Section 5 concludes

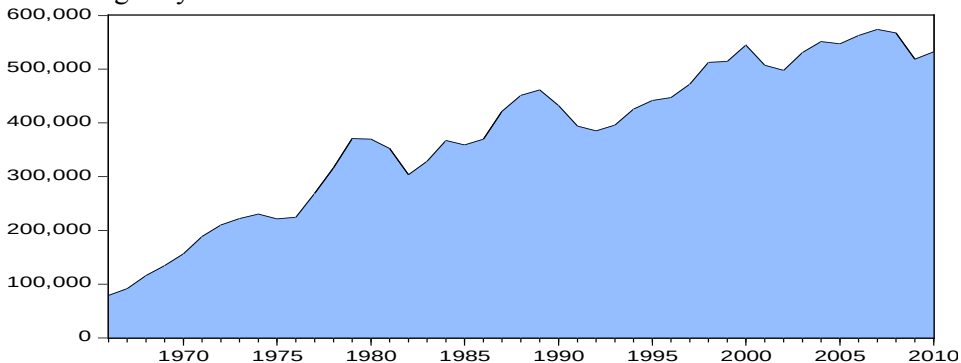
2. Stylised Facts

Barbados is classified by as a small island developing state. In 2010, its population is was less than 285,000 and GDP stood at about US 4 billion.

Prior to the 1950s, the economic fortunes of Barbados were closely tied to its agriculture industry – mainly sugar. But as noted by Worrell et al (2011), during the 1950s and 1960s, tourism began to emerge as a major economic activity. At the same time, several tourism related organisations began to surface: the Barbados Hotel

Association (now the Barbados Hotel and Tourism Association) was set up in 1952; the Barbados Development Board was established in 1957 and a tourist board (now the Barbados Tourism Authority) surfaced in 1958. These establishments aided in further boosting tourism through industrial development, hotel expansion and intense tourism marketing campaigns. But, it wasn't until the post-independence era that tourism really began to take off. As shown in Figure 1, total long-stay arrivals to Barbados moved from a mere 79,104 in 1966 to reach 201,349 in 1972. Thus, arrivals more than doubled in a less than ten years and with the exception of a few dips (early 80's, early 90's, 2001 and 2009), tourism has generally continued on a steady growth path of about 2.5 percent per annum.

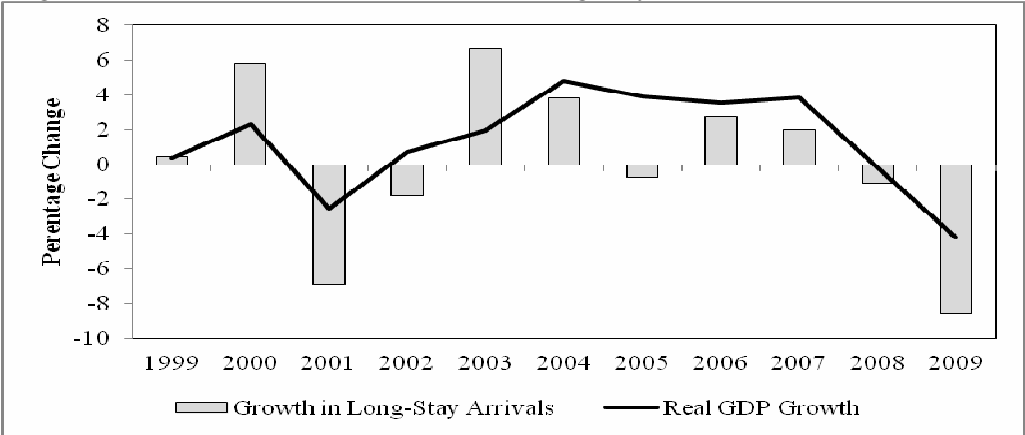
Figure 1: Long-Stay Arrivals to Barbados 1966-2010



To date, tourism has been the main thrust of the Government's developmental strategy. As noted by Lorde et al (2011), the main policy tools by successive Governments to develop the various tourism sectors have been favorable incentives and policies geared towards promoting their competitiveness and sustainability. These incentives usually take the form of tax concessions for a period of time and include the construction of hotels and duty free imports of some supplies and materials. The Government has also invested directly into 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.

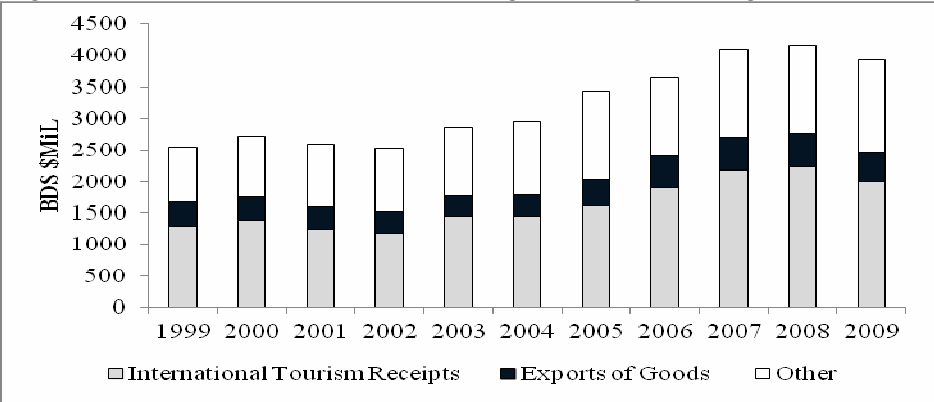
The push towards tourism as a means of economic development is not surprising. First, Barbados holds a natural comparative advantage for the development of its tourism industry: temperatures vary between 20°C and 33°C; there is an abundance of sunshine year-round; and, the island is surrounded by soft, warm, white sand beaches. But, most importantly, the economic fortunes of Barbados are closely tied to its tourism industry (Jackman and Mayers, 2011). As shown in Figure 2, developments in economic growth generally conform to the trends in international tourism. Tourism satellite accounting by the World Travel and Tourism Council estimates that tourism's total contribution to Barbados' employment and gross domestic product is above 45 percent, thus placing Barbados one of the top 20 most tourism-dependent countries in the world.

Figure 2: Real GDP Growth and Growth in Long-Stay Arrivals



More than this Barbados lacks the abundance of natural resources to competitively develop other industries or competitively engage in international trade. Thus, tourism has emerged as the main the main source of foreign exchange (see Figure 3), accounting for nearly 50 per cent of foreign earnings on average. In fact, recent work by Lorde et al (2010), suggest that current account deficits would be unsustainable without the earnings from tourism. The impact of tourism on the Barbadian economy is therefore profound and extensive, and so, unexpected deviations from trends can have serious macroeconomic repercussions for the island. Against this backdrop, detailed information on the tourism-growth relationship is imperative.

Figure 3: Contribution of Tourism to Foreign Exchange Earnings in Barbados



3. Econometric Approach

3.1 Data and Model

The model presented here bares much similarity to that proposed in the literature, consisting of income in the destination county (Y), tourism (T_i) and real effective exchange rates ($REER_i$). The main difference is that the tourism variable here is not aggregated; rather T_i is tourist arrivals from source market i , and the $REER_i$ is the bilateral real effective exchange rate between Barbados and source market i . The source markets used in this study are the US, the UK, Caribbean Community (CARICOM from

henceforth)² and Canada, whose average shares of total arrivals over the sample period were 28.3%, 26.7%, 17.2% and 14.3%, respectively³. The proxy for income is real gross domestic product in Barbados whilst arrivals to Barbados are used to represent tourism activity⁴. The real effective exchange rate is calculated as the Barbadian consumer price index (CPI), divided by the origin country CPI multiplied by the exchange rate between the Barbadian and origin country currency⁵.

The dataset is of quarterly frequency and spans from 1975:1 to 2010:2. Observations on real GDP, arrivals and the nominal exchange rates are taken from the Central Bank of Barbados whilst the consumer price indices series for Barbados and its major source markets are obtained from the International Monetary Fund's (IMF) International Financial Statistics. All variables are expressed in natural logarithms and seasonally adjusted.

3.2 Causality Tests

Over the last three decades, several econometric techniques have been proposed for testing the causal relationship between time series variables. Based on the seminal paper of Granger (1969), 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 .

The typical Granger causality test is conducted within the VAR framework, where a test of joint significance of the lagged values of variable x constitutes the test. However, as shown by Sims, Sotck and Watson (1990), the usual Wald test statistic used for Granger-causality analysis in levels tend to be invalid if variables are integrated or cointegrated. To deal with this issue, the two following measures were proposed:

If the variables are integrated of order d with no cointegration, then the variables are differenced d times before the VAR is estimated.

If the variables are cointegrated, then causality tests are conducted within the VECM framework.

In this study, the Granger-causality testing procedure developed by Toda and Yamamoto (1995) – henceforth TY – is adopted. Unlike the aforementioned approaches, the TY approach is applicable irrespective of whether the variables are stationary, integrated of an arbitrary order or cointegrated of an arbitrary order, as long as the order of integration does not exceed the optimal lag length. As such, one is able to test linear or nonlinear restrictions on the coefficients by estimating a VAR in levels, paying little attention to the integration and cointegration properties of the time series at hand (see Toda and Yamamoto, 1995).

The procedure utilises a modified Wald test for restrictions on the parameters of a VAR (k), where k is the lag-length of the system. This test has an asymptotic χ^2 distribution when a VAR ($k + d_{max}$) is estimated (where d_{max} is the maximal order of integration suspected to occur in the system). Hence, one artificially augments the correct

² CARICOM is a regional group consisting of 13 Caribbean Countries.

³ It should be noted that the remaining source markets are too small relative to the main markets and are usually placed in the category called OTHER.

⁴ While tourism earnings provide the best proxy for tourism activity, tourist arrivals was chosen as a proxy for tourism activity as only sparse data on tourism earnings by source market was available.

⁵ As the bulk of arrivals in CARICOM are from Trinidad, we use the prices from Trinidad and Tobago as a proxy for CARICOM prices.

order, k , by the maximal order of integration, d_{max} . The coefficients of the last d_{max} lags are ignored (as they are regarded as zero), and the restrictions on the first k coefficients constitute the Granger-causality tests. As outlined by Rambaldi and Doran (1996), the numerical value of the required Wald test is obtained using the seemingly unrelated regressions (SUR) routine.

3.3 The stability of the causal relationships

Given the possibility that a causal relationship may not be stable over time, this study incorporates the rolling-sample procedure into the causality tests in order to gain additional insight on the persistence and therefore, the validity of the TLG Hypothesis. Before conducting a rolling causality test, one needs to determine the size of the rolling window. Based on the previous literature, the setting of the window size appears to be arbitrary. Furthermore, there is no statistical procedure to set the optimal window size. As such, the window size is set at 75 quarters, as this size is sufficient to maintain the statistical power of the test. The 75-quarter rolling statistics are also normalised using the 10 per cent critical values. If this ratio is above one then the null hypothesis of no-causality will be rejected. And so, if the tourism-growth nexus is stable, the M-Wald test statistics should remain largely significant as time progresses.

4. Empirical Results

As a preliminary step to the causality analysis, the optimal lag length k for each system is determined using the Akaike information criteria. Based on the results of a set of unit root tests (i.e. the Kwiatkowski-Phillips-Schmidt-Shin, augmented Dickey-Fuller and Phillips-Perron tests), the maximal order of integration d in the series is set at one. Table 2 shows the results of the causality tests.

Table 2: Causality Tests

Source Market		p-values
United Kingdom	$T \not\rightarrow Y$	0.010
	$Y \not\rightarrow T$	0.966
United States	$T \not\rightarrow Y$	0.023
	$Y \not\rightarrow T$	0.892
Canada	$T \not\rightarrow Y$	0.084
	$Y \not\rightarrow T$	0.975
CARICOM	$T \not\rightarrow Y$	0.025
	$Y \not\rightarrow T$	0.025

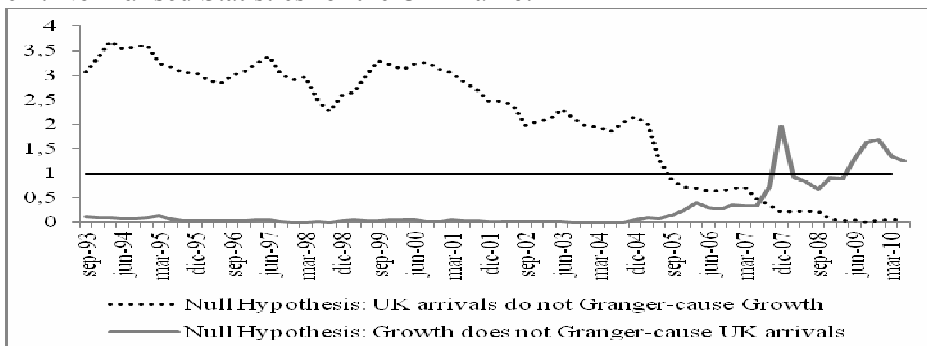
Notes: The notation $T \not\rightarrow Y$ represents the null: Tourism does not Granger-cause growth. A similar interpretation follows for the remaining hypotheses, $Y \not\rightarrow T$. When $p < 0.10$ there is empirical evidence for rejecting the null hypothesis.

Looking first at the results for the tourism-led growth hypothesis, there is evidence to suggest that irrespective of the country of origin, tourism leads economic growth in Barbados. Specifically, all causal relationship between the series is significant at the 10 percent levels. As shown by the p-values, the strongest causal relationship i.e. the most statistically significant stems from the UK (p-value is 0.01), followed by US and CARICOM. Interestingly, this order coincides with the size of the tourism markets – the UK is Barbados’ largest source market, followed by the US and CARICOM. Taken at face value, one may agree that size of the market may have some bearing on the strength of the association between arrivals from that market and economic growth in Barbados.

Next, the validity of the supply side hypothesis is investigated. Based on the M-Wald test statistics, there is not enough evidence to reject the null that output does not cause or precede arrivals for the US, UK and Canadian markets. However, the results do suggest that economic growth in Barbados plays a significant role in the expansion of the arrivals from CARICOM. One possible explanation for these results may be that the per capita income levels in US, UK and Canada are generally higher than that of the CARICOM countries (i.e. other Caribbean countries) reflecting different stages of development. Thus, the advanced countries seem to be less influenced by the level of development of the destination country. This is indeed plausible given that visitors from US, UK and Canada are chiefly drawn to Barbados for its natural physical attributes (namely sun, sea and sand) or at least much more so than visitors CARICOM countries, who originate from countries who have similar characteristics to Barbados.

In the final stage of the analysis, the persistence of the causal relationships is investigated. Figures 4-7 plot the normalised rolling Wald statistics. It should be noted, that if the plotted line is above the horizontal line, this indicates that relationship over that time period is statistically significant at the 10 percent level; if below – it is insignificant. Overall, neither the TLG nor supply side hypothesis appears to be stable over the entire sample period i.e. for each source market, the plotted normalised Wald statistics fall below one at some point in time during the sample period. For instance, from Figure 4, one can conclude that expansions in the UK market has been a significant growth factor for Barbados up to September 2005; thereafter, the plotted normalised statistics fall below one, and thus, the relation can be deemed insignificant. Thus, the though the hypothesis that arrivals from the UK Granger-Causes growth in Barbados is valid (by the Granger-causality test), the relation is not stable as it does not hold for the entire sample period.

Figure 4: Normalised Statistics for the UK Market



As in the case of the UK, there are breaks in the causal relationships between arrivals from all source markets and economic growth in Barbados (see Figures 5-7).

Figure 5: Normalised Statistics for the Canadian Market

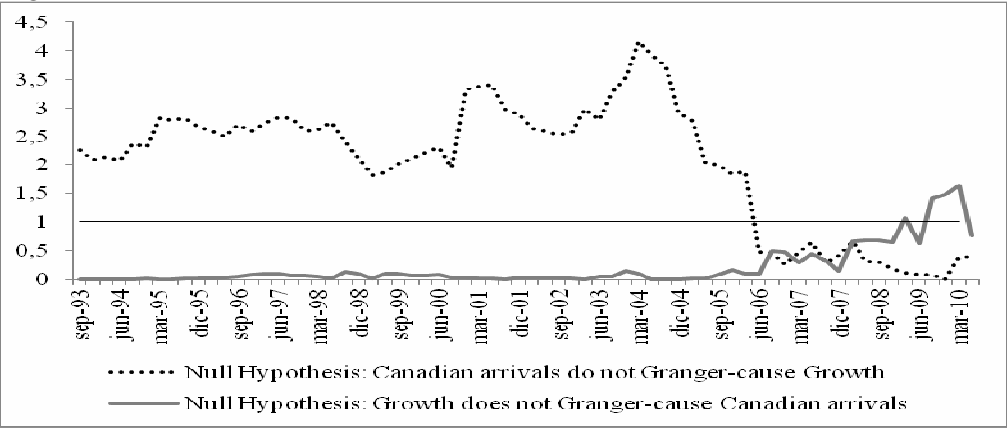


Figure 6: Normalised Statistics for the CARICOM Market

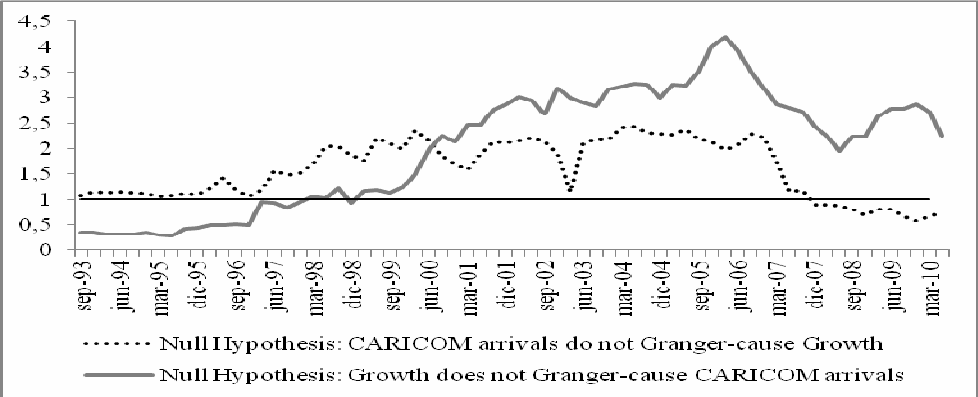
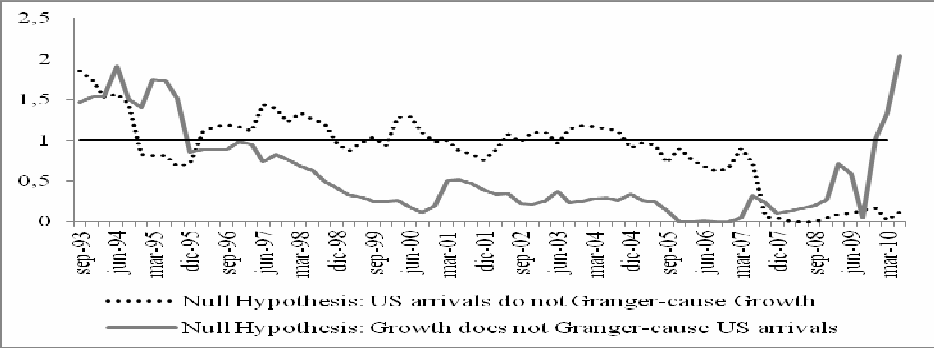


Figure 7: Normalised Statistics for the US Market



In fact, the TLG hypothesis appears to hold from 1993 to about 2005 (or thereabout) for most source markets. Thereafter, the null hypotheses could not be rejected, indicating a possible structural break in the relationship during the 2005-2010 period. The next logical question to ask would be: what changes in the 2005-2010 period could have led to the breaks in relationship? An analysis of growth patterns in Barbados revealed that during most of that period, economic growth in Barbados was being led by the non-traded sectors, construction in particular. It is possible that the results may be picking up the temporary shift from traded to non-traded activities during the period. Also, the global recession between 2008 and 2010 and commensurate fall in arrivals in this period, could also be significant factors.

An interesting observation is that of all the markets under evaluation, the results for the US market (Figure 7) seems to be the most volatile, with additional breaks occurring around the 1994, 1999, 2001-2002 time periods, two of which directly correspond to periods of economic recessions in the US. This is not surprising given that in general, that the demand for tourism services in any country would depend, in part, on the economic conditions in the source country and hints that the fall US arrivals that stem from a recession in that country, causes a break the US arrivals-growth nexus.

5. Concluding Remarks

In attempting to determine the economic significance of the tourism, researchers tend to use a contemporaneous aggregate measure of tourism, either aggregate tourism earnings or total tourist arrivals. Instead, this paper adopts a disaggregated market approach to testing the TLG hypothesis. The main advantage of the disaggregated approach is that it provides additional information about the effects of specific tourism markets on growth. Indeed, knowing the extent of shocks to any individual market on the economy is crucial in economic planning and forecasting. Results from causality tests support the notion that the TLG hypothesis is valid in Barbados regardless of the origin country i.e. tourist are capable of boosting growth irrespective of their country of origin.

But, what is particularly interesting is that neither the TLG nor supply-side hypothesis is stable over the time period, with distinct breaks in the 2005-2010 time periods, which correspond to periods where economic growth in Barbados were led by the non-traded sectors. This instability in the tourism-growth nexus can have grave repercussions on economic volatility in the long run, given the countries extensive reliance of tourism. The main policy implication thus emanating from these findings is that a sole reliance on the tourism sector can be harmful, and so it is recommended that policy makers simultaneously pay attention to not only the tourism industry, but all other major industries as well.

Notwithstanding the insights the study has provided, it is not without its limitation. Indeed, a corollary of the findings of the study is the sensitivity of the results to the measure of tourism used. For instance, it is possible that an alternative measure (say, tourism earnings) could present rather different results. Unfortunately, a breakdown of tourist expenditure by source market was not attainable at the time of writing. Hence, the presented results are more indicative than conclusive.

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