

TOURISM AND ECONOMIC GROWTH: THE CASE OF SINGAPORE

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Abstract

This paper investigates the long-run and the short-run dynamics between tourism and economic growth in Singapore. Using the bounds test developed by Pesaran et al. (2001), cointegrating relationship between tourism and economic growth is not found. The standard Granger causality test reveals that there is a unidirectional Granger causality from economic growth to tourism. This study provides evidence to support growth-led tourism hypothesis.

JEL classification: O10, C22

Keywords: Tourism; Economic growth; Granger causality

1. Introduction

In Singapore, tourism industry receives heavy supports from its government. Singaporean government has launched “Uniquely Singapore” marketing campaign through Singapore Tourism Board (STB) in March 2004 in Singapore. Subsequently, this campaign was launched in the various key markets, such as in Germany in ITB trade show on 12 March 2004. Recognizing the importance of tourism to economic activities, on 11 January 2005, Minister for Trade and Industry of Singapore unveiled the STB’s bold targets of tripling tourism receipts to S\$30 billion and doubling visitor arrivals to 17 million in year 2015. This initiative will be supported by a S\$2 billion Tourism Development Fund.

It is widely believed that tourism generates income of a destination country if tourism is one of the main export services in the destination country. The positive contributions of tourism are

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attributed to the provision of hard currency, creation of employment opportunities and accumulation of physical capital.

However, the empirical studies on the relationship between tourism and economic growth have produced contradictory results. The differences in the findings can be attributed to different countries, different dataset and/or different methodologies been used. Using the data from the first quarter of 1975 to the first quarter of 1997, Balaguer and Cantavella-Jorda (2002) find tourism Granger causes economic growth in Spain with the methods developed by Johansen (1988) and Johansen and Juselius (1990). Oh (2005) is unable to find the evidence of cointegration between tourism and GDP with the test developed by Engle and Granger (1987) using first quarter of 1975 through the first quarter of 2001 of Korea. His results show that economic growth Granger causes tourism. However, Kim et al. (2006) show that there is a bidirectional Granger causality between tourism and economic growth for Taiwan. In their study, they have used quarterly data from the first quarter of 1971 to second quarter of 2003 and annual data from 1956 to 2002.

Recognizing that the direction of causality leads to different tourism marketing and policy decisions, this paper examines the direction of Granger causality between tourism and economic growth for Singapore. The bounds test developed by Pesaran et al. (2001) is used to check for the presence of cointegration, instead of alternative methods, such as the Engle and Granger (1987), Johansen (1988) and Johansen and Juselius (1990) approaches, which are commonly used in existing empirical literature.

The rest of this paper is presented as follows. Section 2 describes the data sources, presents the econometric methodology, and analyses the empirical findings. Section 3 concludes this paper with implications for policy purposes.

2. Data, methodology and results

Figure 1 shows the quarterly total visitor arrivals obtained from STB. This data excludes the arrivals of Malaysians by land. The original dataset of STB provides only monthly data. The author has transformed the monthly data to quarterly data in this study. Figure 2 shows the quarterly gross domestic product at 2000 market prices obtained from the Department of Statistics, Singapore. This is measured in million Singapore dollars. Both series are from the first quarter of 1978 to the second quarter of 2007. From the time series plots, it is observed that both series show an upward trend. After the first quarter of 1997, there is an increase in the fluctuation of total visitor arrivals. A similar pattern is also found in gross domestic product. The output and tourism industry of Singapore suffer a setback as a result of the financial crisis that hit Southeast Asia region in July 1997. A vertical dash line is introduced in Figure 1 and Figure 2 to show the first quarter of 1997.

Figure 1
Quarterly Total Visitor Arrivals

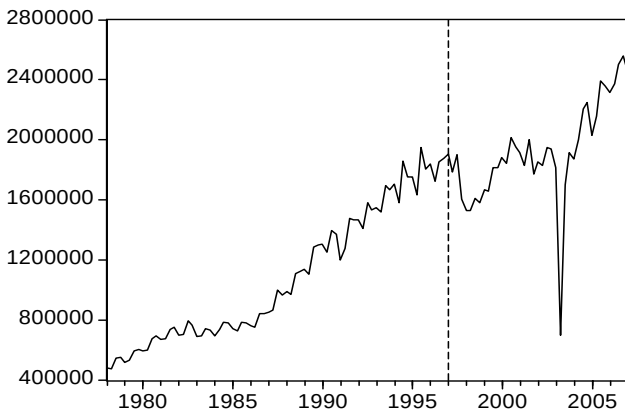
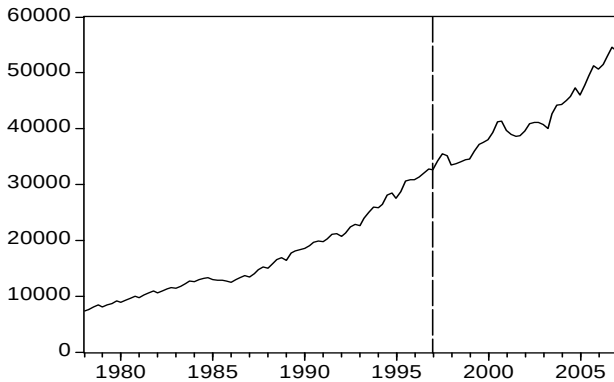


Figure 2
Quarterly Gross Domestic Product at 2000 Market Prices
(measured in million Singapore dollars)



Both series are transformed by applying the natural logarithm on each of them. I denote natural logarithm of gross domestic product at 2000 market prices as GDP and natural logarithm of total visitor arrivals as TOURIST. I adopt a 3-stage approach in the implementation of Granger causality test which is commonly used by the researchers.

First, the order of integration of each series is investigated with the tests developed Phillips and Perron (1988) (PP test) and Kwiatkowski et al. (1992) (KPSS tests). The null hypothesis of PP test is a series is nonstationary, whereas the null of KPSS test is a series is stationary. PP test incorporates an automatic correction to the test proposed by Dickey and Fuller (1979, 1981) to allow for autocorrelated residuals. I use kernel sum-of-covariances estimator with Bartlett weights in the implementation of PP and KPSS tests. The lag length of each test is determined by Newey-West automatic bandwidth selection method. The results of unit root tests are reported in Table 1. In this study, these tests give same results. Both tests report that each of these series is integrated of order 1. Each of these series has only one unit root.

Table 1. Unit Root Tests

Variable	PP Test	KPSS Test
GDP	-1.4441[8]	1.2881[9]***
Δ GDP	-10.9427[8]***	0.1872[8]
TOURIST	-1.5600[5]	1.2164[9]***
Δ TOURIST	-18.7796[3]***	0.0515[2]

***, ** and * denote the null hypothesis is rejected at 1% level, 5% level and 10% level, respectively. The value in each parenthesis is the lag length determined by Newey-West automatic bandwidth selection method

Since both series are integrated of order one, I proceed with the investigation for cointegration. The bounds test within the autoregressive distributed lag framework developed by Pesaran et al. (2001) is used to test for cointegration because it has better small sample properties in comparison to other widely used alternatives such as the Engle and Granger (1987), Johansen (1988) and Johansen and Juselius (1990) approaches. Pesaran and Shin (1999) show that the ARDL based estimators of the long-run coefficients are super-consistent. Another advantage of the bounds test is that this test can be used irrespective of whether the series are pure I(1), I(0) or mutually cointegrated. The bounds test examines whether a long-run relationship exists in the following unrestricted error correction models:

$$\Delta \text{GDP}_t = \alpha_0 + \sum_{i=1}^n \alpha_{Gi} \Delta \text{GDP}_{t-i} + \sum_{i=1}^n \alpha_{Ti} \Delta \text{TOURIST}_{t-i} + \alpha_1 \text{GDP}_{t-1} + \alpha_2 \text{TOURIST}_{t-1} + \varepsilon_{1t}$$

(1)

$$\Delta \text{TOURIST}_t = \beta_0 + \sum_{i=1}^n \beta_{Ti} \Delta \text{TOURIST}_{t-i} + \sum_{i=1}^n \beta_{Gi} \Delta \text{GDP}_{t-i} + \beta_1 \text{TOURIST}_{t-1} + \beta_2 \text{GDP}_{t-1} + \varepsilon_{2t}$$

(2)

In equation 1, the null hypothesis of no cointegration amongst the variables is $H_0: \alpha_1 = \alpha_2 = 0$ against the alternative hypothesis of $H_1: \alpha_1 \neq \alpha_2 \neq 0$. In equation 2, the null hypothesis of no cointegration amongst the variables is $H_0: \beta_1 = \beta_2 = 0$ against the alternative hypothesis of $H_1: \beta_1 \neq \beta_2 \neq 0$. The null hypothesis can be

tested with the F-test. But, the F-test has a non-standard distribution. The null hypothesis of no cointegration of each equation is stated in the second column of Table 2. The fourth column of this table lists the calculated F-statistics. The value of n in each equation is the lowest value where Breusch-Godfrey Lagrange multiplier test with lag order of 4 is unable to reject the null hypothesis of no autocorrelation at 5% significance level. The lag order of 4 is selected because quarterly data is used in this study.

Table 2.
The results of the bounds test for cointegration

Equation	H_0	n	F-value
(1)	$\alpha_1=\alpha_2=0$	10	1.9151
(2)	$\beta_1=\beta_2=0$	2	3.8329

*, ** and *** indicate statistically significant at 10%, 5% and 1% levels, respectively.

The critical values are obtained from Table CI(iii) in Pesaran et al. (2001). At k=1, the critical value bounds are (4.04, 4.78) at 10% significance level, (4.94, 5.73) at 5% significance level and (6.84, 7.84) at 1% significance level. The null of no cointegration for each equation is accepted because the computed F-statistic is lower than the lower bound of critical value band. Therefore, I conclude that there is non-existence of long-run Granger causality either from GDP to TOURIST or from TOURIST to GDP.

Given that these series are nonstationary and there is no evidence of cointegration, Granger causality test is applied on the VAR estimation with only first differences of these series as below:

$$\Delta GDP_t = \alpha_0 + \sum_{i=1}^r \alpha_{Gi} \Delta GDP_{t-i} + \sum_{i=1}^r \alpha_{Ti} \Delta TOURIST_{t-i} + u_{1t} \quad (3)$$

$$\Delta TOURIST_t = \beta_0 + \sum_{i=1}^r \beta_{Ti} \Delta TOURIST_{t-i} + \sum_{i=1}^r \beta_{Gi} \Delta GDP_{t-i} + u_{2t} \quad (4)$$

The selection of the value of r corresponding to either equation (3) or equation (4) is done in a similar way as the selection of the value of n in equation (1) and equation (2). The standard Granger causality test is applied on them. There is no Granger causality from TOURIST to GDP if the null of $\alpha_{T1}=\alpha_{T2}=\dots=\alpha_{Tr}=0$ is accepted. Similarly, there is no Granger causality from GDP to TOURIST if the null of $\beta_{G1}=\beta_{G2}=\dots=\beta_{Gr}=0$ is accepted. The value of r for equation (3) is 12. The selected value of r corresponding to equation (4) is 2. The results of short-run Granger causality are reported in Table 3.

Table 3
The results of Granger's causality test: short-run

Dependent Variable	Δ GDP	Δ TOURIST
Δ GDP		1.3186
Δ TOURIST	7.9177***	

*, ** and *** indicate statistically significant at 10%, 5% and 1% levels, respectively, based on F-test.

The results indicate that there is only a unidirectional short-run Granger causality from GDP to TOURIST. The sign of this causal effect is determined by adding the estimated coefficients of lagged Δ GDP as suggested by Ram (1988). The estimated coefficient of Δ GDP_{t-1} is 1.7051 and the estimated coefficient of Δ GDP_{t-2} is -0.4779 in equation (4). The combined value of these two estimated coefficients is 1.2272. This result supports the hypothesis that the supply of tourist services and attractiveness increase with GDP.

We must be aware that Granger's test is interesting but limited due to multicollinearity and the missing contemporaneous values of the explanatory variables, as pointed out in Guisan (2003), and these features may explain the non-significant effect of tourism on GDP in this case. The positive effects of tourism on real GDP and employment have been found in several econometric studies. For instance, Guisan, Aguayo and Exposito (2001) show the positive impact of exports of services on economic growth with a sample of 132 countries. This is apparent in Guisan and Aguayo (2002) and

Guisan, Aguayo and Carballas (2004) whose works show the positive effects of tourism on economic development and employment of European regions.

3. Conclusion

The importance of tourism industry in promoting economic growth has been emphasized in a number of studies. However, empirically, contradictory results on the contribution of tourism to economies have been found. In this study, I am unable to find long-run relationship between GDP and tourism in Singapore. There is evidence to support short-run unidirectional Granger causality from GDP to tourism. This provides support for economic-driven tourism expansion instead of tourism-led growth.

Although Singapore is a small island-state, it is one of the economic powerhouses. The rapid growth of and the spectacular economic success of Singapore have captured the attention of residents in other countries. Singapore has very few natural attractions. Most of its attractions are man-made, for instance, Sentosa Island and Chinese Garden. Its international reputation for safety and cleanliness, its world-class convention facilities and its high quality hospital and health services have attracted inbound tourists (Khan and Abeyasinghe, 2002). Significant amount of resources are required for the upgrading and maintenance of existing attractions and infrastructure. Sufficient provision of such resources is made possible through the economic growth. These explain the possible reasons why there is a short-run causality from GDP to tourism.

It is unlikely for Singapore to increase the number of tourists forever. The number of inbound tourists to Singapore is restricted by the size of Singapore and its shortage of natural attractions. As one of the countries classified by the World Bank in high income category, Singapore has average educational attainment of labour force similar to other advanced countries (see Barro and Lee, 2001). Therefore, the increase in the number of inbound tourists cannot lead to continuous improvement in the human capital, mainly educational

level, of Singapore. These probably explain why tourism and economic growth do not form long-run relationship. Also, there is no short-run causality from Tourism to economic growth.

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¹ <http://ideas.repec.org/s/ea/ecodev.html>

² <http://www.usc.es/~economet/acid.htm>

³ <http://ideas.repec.org/p/wiw/wiwrse/ersa04p468.html>