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Research Note

Determinants of the Taiwanese tourist hotel industry cycle

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ABSTRACT

This paper contributes to the tourism literature by examining determinants of the Taiwanese tourist hotel industry (THI) cycle. This study uses a Markov-switching model (MSM) proposed by Hamilton (1989) to analyze the Taiwanese tourist hotel industry cycle. The MSM decomposes the tourist hotel industry cycle into two distinct states: high-growth and low-growth (HGS and LGS). The mean growth rate of HGS is 1.5% and the average growth rate of LGS is 0.07% during the period from December 1999 to February 2011. The corresponding standard deviations in the two regimes are 0.008% and 0.038%, implying that HGS is more stable than LGS. Moreover, the probability of staying in HGS is 94% and the probability of remaining in LGS is 65%. The expected durations of HGS and LGS are about 16 and 3 months, respectively. Further, the paper investigates the factors that keep the THI in HGS. Empirical test results show that growth in the international tourism market and industrial production growth rate are two key factors that keep the THI in HGS, but the SARS outbreak in 2003 has had an adverse effect.

1. Introduction

The tourist hotel industry (THI) in Taiwan has grown rapidly. According to the Annual Report of the Tourism Bureau of Taiwan (TBT, 2011), there were 44 tourist hotels in 1985.[1] Since then the number of tourist hotels has risen by 186.4% to 106 at the end of 2011.

The Taiwanese government's efforts explain the rapid expansion of THI in Taiwan. Taiwan has traditionally been an export-oriented country, not a popular international tourist destination. However, understanding that the proceeds from tourism expansion can represent a significant income source for the national economy (Kim et al., 2006), the Taiwanese government has begun developing its international tourism market. Moreover, Chen (2011) showed that the development of the Taiwanese THI relies on the growth of the tourism market, proxied by the growth of total foreign tourist arrivals. Specifically, the tourism market expansion could explain 53% of occupancy rate, 92% of revenue per available room, 45% of return on asset and 48% of return on equity of tourist hotels in Taiwan.

Since 2002, the Taiwanese government has implemented many tourism strategic plans to promote international tourism. In that year, the TBT introduced the "Doubling Tourist Arrivals Plan" (DTAP), designed to strengthen the national economy by attracting 5 million international visitors to Taiwan by 2008. Although the DTAP was a casualty of poor global economic performance and the outbreak of Severe Acute Respiratory Syndrome (SARS) in 2003, the TBT introduced several more tourism promotion plans to promote international tourism and attract more foreign tourists. In 2005, the Tourism Flagship Plan was launched to promote the nation's top attractions and cultural festivals. The Tour Taiwan Years 2008–2009 Plan introduced at the end of 2007 was intended to attract 4.25 million foreign visitors to Taiwan by 2009.

Moreover, Taiwan opened its tourism market to Chinese tourists in 2008. The Taiwanese president Ma Ying-Jeou has endorsed stronger economic ties with China since taking office in May 2008 (TBT, 2008). One of his policies was to re-open direct flights between Taiwan and China, which had been banned since 1949. Taiwan and China signed the agreement to restore regular direct flights between the two regions on June 13, 2008 and direct flights resumed on July 4, 2008. Since then, up to 3000 Chinese tourists a day are allowed to visit Taiwan and the number increased from 3000 to 7200 after May 2009. In 2011, Chinese tourists were allowed to visit Taiwan without having to join tour groups. According to the Annual Statistics of Tourism 2010 (TBT, 2011), the total number of foreign visitors to Taiwan has increased from 1.022

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[1] According the hotel classification system by Taiwan Tourism Bureau, hotels in Taiwan are divided into two groups: general and tourist. Unlike general hotels, tourist hotels are built in accordance with higher standards of construction and facilities set by the Taiwanese government and provide higher quality of guest rooms and amenities such as restaurants, swimming pools, gymnasiums and conference halls (TBT, 2011).

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million in 2001 to 3.246 million in 2010, approximately a 218% growth rate over the 10-year period. This phenomenal growth of the tourism market growth is expected to create a significant demand for hotels, thereby improving the corporate performance of the Taiwanese tourist hotel companies.

The fast-growing THI in Taiwan has attracted academic researchers' attention and spurred many empirical research studies. Although previous studies have made different contributions to the body of research on THI in Taiwan, no empirical work has analyzed the Taiwanese THI cycle. This study makes another contribution to the tourism literature by examining determinants of the Taiwanese tourist hotel industry cycle. The examination follows two steps.

First, this study uses a Markov-switching model (MSM) proposed by Hamilton (1989) to analyze the Taiwanese THI cycle. Based on an MSM, this study can estimate the probabilities of high- and low-growth THI states, each with its specific characteristics (i.e. unique mean and variance). This analysis can shed light on the characteristics of the Taiwanese THI and empirical findings provide valuable information and have important implications for hotel business owners and managers in Taiwan. Note that although the references to the MSM within the context of tourism demand are sparse, this study is not the only work in the tourism field to apply the MSM. See Claveria and Datzira (2010), Cuñado and Gil-Alaña (2007), and Moore and Whitehall (2005) for a good review.

Second, the paper investigates the factors that keep the THI in high-growth state. The government authorities will be interested in understanding this issue because the answers can help to sustain the industry. The remainder of this article is organized as follows. Section 2 describes the data and the Markov-switching model. Section 3 presents empirical test results. Section 4 shows the determinants of the Taiwanese THI cycle. Section 5 concludes the study with a discussion of major findings.

2. Data and model

2.1. Data

This study uses the total sales revenue of the Taiwanese tourist hotels to analyze the Taiwanese THI cycle. Taken from the Taiwan Economic Journal database, the aggregate sales revenue data of the tourist hotels were only available on a monthly basis. The study sample covers December 1999 to February 2011. Fig. 1 plots the total sales revenue of tourist hotels over the period under analysis.

As shown in Fig. 1, the terrorist attacks of September 11, 2001 in the US had a negative impact on the sales revenue of the tourist hotels in Taiwan. The Taiwanese THI experienced the sharpest decline in total sales revenue in 2003 in the wake of the outbreak of SARS on April 22, 2003. Since then, the Taiwanese THI maintained an upward growth trend until 2008. The 2008 global financial crisis caused significant declines in personal income and travelers/tourists, which then created a decline in sales of the THI. However, the sales of the Taiwanese THI have made a strong recovery since the last six months of 2009.

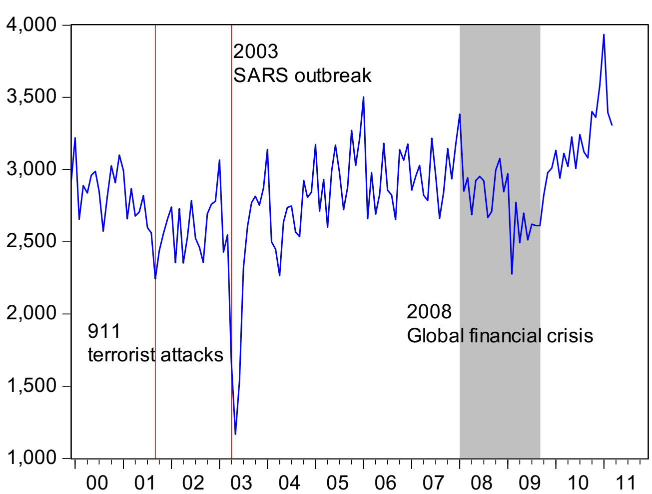

Fig. 1. The total sales revenue of tourist hotels (in million NT dollar).

In addition, the monthly data of sales revenue of the tourist hotels is seasonally adjusted to account for the issue of seasonality. Before the analysis, the unit root test proposed by Elliott, Rothenberg, and Stock (1996) is performed to examine the stationarity of the monthly sales revenue data. Test results indicate that the null hypothesis of one unit root cannot be rejected for levels, but is rejected for their first differences, suggesting the nonstationarity of the monthly sales revenue data. The summary statistics of the monthly sales growth rate of tourist hotels ($SG_t = (Sales_t - Sales_{t-1})/Sales_{t-1} \times 100\%$) are as follows. The mean value of SG_t over the entire sample period is 1.351%, ranging from −36.768% to 46.328% with a standard deviation of 11.102%.

2.2. The Taiwanese THI cycle model

As stated earlier, an MSM is used to model the business cycle of the Taiwanese THI. Consider the following two-regime Markov-switching model of the THI cycle:

$$SG_t - \alpha_{S_t} = \sum_{i=1}^{q} \phi_i \left(SG_{t-i} - \alpha_{S_{t-i}}\right) + e_t, \tag{1}$$

$$\alpha_{S_t} = \alpha_0 (1 - S_t) + \alpha_1 S_t, \tag{2}$$

where ϕ is the coefficients on the autoregressive terms, $S_t = 0$ or 1 represents the unobserved state of the THI cycle, and $e_t \sim i.i.d.N(0, \sigma^2_{S_t})$. α_{S_t} and σ_{S_t} are the state-dependent conditional mean and standard deviation of SG_t respectively. Thus, α_0 (α_1) is the mean growth rate of state 0 (state 1) and σ_0 (σ_1) is the standard deviation of state 0 (state 1) of THI.

The appropriate lag length of the autoregressive specification $AR(q)$ as given in Eq. (1) is selected based on the smallest value of Schwarz's Bayesian Criterion (Schwarz, 1978): $SBC = n\log(ssr) + k\log(n)$, where n is the number of observations, ssr is the sum of squared residuals and k represents number of regressors. Further, the conditional distribution of SG_t given S_t is modeled as:

$$f(SG_t | S_t = i; \theta) = \frac{1}{\sqrt{2\pi\sigma_i^2}} \exp\left(\frac{-(SG_t - \alpha_i)^2}{2\sigma_i^2}\right), \tag{3}$$

where $f(\cdot)$ is the normal density and θ is a vector for parameter, $\theta = (\alpha_0, \alpha_1, \sigma_0, \sigma_1, P_{00}, P_{11})$. The variables are estimated based on the Maximum Likelihood Estimation (MLE) approach (Hamilton, 1989).

The specification above shows that the state of THI cycle would follow a two-state Markov chain. The transition from one state to the other is modeled as a Markov chain process and depends on probabilities of transition between the two regimes. A two-state Markov process with fixed transition probability matrix is given as follows:

$$P = \begin{bmatrix} P_{00} & P_{01} \\ P_{10} & P_{11} \end{bmatrix}, \tag{4}$$

where $P_{00} = \Pr[S_t = 0 | S_{t-1} = 0]$,

$P_{10} = \Pr[S_t = 1 | S_{t-1} = 0] = (1 - P_{00})$,