Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
Interactions between business conditions and financial performance of tourism firms: Evidence from China and Taiwan

Ming-Hsiang Chen*

Department of Finance, National Chung Cheng University, Chia-Yi, Taiwan, ROC

Received 3 December 2004; accepted 21 November 2005

Abstract

This study contributes to the fields of hospitality and tourism by examining interactions between business conditions and financial performance of tourism firms in both China and Taiwan. We investigate whether the improvement of business conditions enhances financial performance of tourism firms and whether financial success of tourism firms matters to business development. In general, cointegration test results support a long-run equilibrium relationship between the two variables, business conditions and financial performance of tourism firms, and Granger causality test results show that these two factors reinforce each other in both China and Taiwan. This study therefore documents significant contributions of financial success of tourism firms to business development and strengthening of financial performance of tourism firms by business conditions. Some managerial implications are also discussed.

Keywords: Business condition; Performance of tourism firms; Causality; China; Taiwan

1. Introduction

Financial performance has been widely used as an indicator for business performance (Ezzemel, 1992; Ezzemel & Hart, 1989; Rappaport, 1986). Heiman (1988) argued that there are possibly various indicators of a company’s financial success, but the company’s stock price is considered to be the most important.

The basic stock valuation model asserts that stock price is equal to the present value of expected future dividend payments, which is formulated as:

\[ P_t = \sum_{i=1}^{\infty} \frac{D_i}{(1 + r)^t}, \]

where \( P_t \) is the stock price at time \( t \), \( D_i \) is the dividend payment at the end of time \( t \), and \( r \) is the discount rate used to bring the future dividends to present value. Assuming that dividends are a linear function of earnings (\( E \)) and \( D_i = q \cdot E_i \), where \( q \) is the constant payout ratio, we can write Eq. (1) as:

\[ P_t = q \cdot \sum_{i=1}^{\infty} \frac{E_i}{(1 + r)^t}. \]
A positive economic impact usually leads to an increase in sales and hence income (and earnings), which in turn can improve the performance of business firms. On the other hand, corporate earnings and dividends are most likely to decrease if business conditions are expected to deteriorate. This reduction in expected earnings and dividends will in turn cause a decrease in the stock price or the firm’s performance (Harvey, 1991). Conversely, financial success of business firms can lift business conditions by generating job opportunities, business turnover, and government taxes (Jeon et al., 2004).

Many studies in economics and finance literature have examined the relationship between business or economic progress and financial sector development (Arestis, Demetriades, & Luintel, 2001; Atje & Jovanovic, 1993; Fase & Abma, 2003; Harris, 1997; King & Levine, 1993a,b; Levine, 1991; Levine & Zervos, 1996,1998; Mazur & Alexander, 2001). Empirical evidence suggests a strong positive correlation between the development of financial markets and economic growth. The direction of the causality, however, is still largely under debate.

Given the above illustration, this study attempts to examine the dynamic interactions between business conditions and financial performance, using tourism firms in China and Taiwan. To date, no empirical work has been devoted to the examination of long-run relationship and causality of the two variables in the hospitality and tourism industry. Thus, this research should add significant contributions to the hospitality and tourism literature by shedding some light on the interaction between business conditions and financial performance of tourism firms.

Specifically, we test the following two hypotheses. The first hypothesis proposes that there is a long-run relationship between business conditions and financial performance of tourism firms. The second hypothesis tests if there exists at least one-way causality between the two variables. This hypothesis can be further broken down into three propositions.

**Proposition 1.** A unidirectional causality runs from business conditions to financial performance of tourism firms. In other words, improved business conditions can enhance financial performance of tourism firms.

**Proposition 2.** A unidirectional causality runs from financial performance of tourism firms to business conditions. Therefore, financial success of tourism firms can energize business conditions.

**Proposition 3.** A bi-directional causality between the two variables exists. That is, an improvement in business conditions strengthens financial performance of tourism firms and healthy financial performance of tourism firms can lift business conditions.

The paper is organized into seven sections. The next section briefly reviews the literature. Section 3 describes the data and their unit root test results. This section is followed by the examination of cointegration between business conditions and financial performance of tourism firms. Section 5 presents causality tests between business conditions and financial performance of tourism firms. Managerial implications generalized from this empirical research are provided in Section 6. The final section contains concluding remarks.

### 2. Literature review

In the hospitality and tourism literature, Nicolau (2002) uses stock price as the proxy for business performance measure to analyze the impact of the announcement of a new hotel opening on the performance of its chain in Spain. Results based on this event study shows that the announcement has a positive effect on the performance of its chain. Chen and Bin (2001) examine the effect of legislation events on stock performance of US casino gaming firms. They find that different types of casino companies show different reactions to gaming legislation announcements. Chen, Jang, and Kim (2006), using the event study approach, test the effect of the severe acute respiratory syndrome (SARS) outbreak in 2003 on Taiwan hotel stock prices. They detect a significantly negative mean abnormal return in Taiwan hotel stocks on and after the day of the SARS outbreak.

Choi, Olsen, Kwansa, and Tse (1999) develop a model to capture business cycle for the US hotel industry, which offers useful guidelines for practitioners and researchers in the hotel industry. Aimed to cover hotel activities as broadly as possible, the developed hotel industry cycle model illustrates the magnitude of growth in the US hotel industry. They find that the hotel industry experienced high growth every 4 or 5 years over a 28-year period from 1966 to 1993. Specifically, the average contraction period is about 2 years, while the average expansion period is about 3 years. They further show that the hotel industry leads general business cycle peaks by approximately 0.75 years on average and leads troughs in the general business cycle by an average of 0.5 years.

Several papers examine stock valuation and risk of hotel and restaurant firms. Rushmore (1992) investigates seven stock valuation techniques used for the acquisition and appraisal of hotels in the US and discusses the strength and weakness of each technique. Borde (1998) uses the ordinary least square (OLS) regression to test the risk diversity across restaurants in the US He illustrates that the investment risk of restaurant companies can be predicted by some financial characteristics such as liquidity, dividend-payout ratio, operating returns, and growth opportunities. Elgonemy (2000) studies the pricing of US lodging stocks. He argues that the traditional valuation measures are obsolete in the new economy.

Sheel and Nagpal (2000) analyze a long-run equity performance of acquiring firms in the US hospitality industry. Negative performance of equity value of acquiring hospitality firms is evidenced in their study over the
Several non-macro forces, financial crises, natural disasters of tourist arrivals is positive but not significant. The impact of growth economic variables, as another critical macro factor that arrivals, in conjunction with other commonly used macro-variables, money supply and unemployment rate, significantly affect hotel stock returns. Moreover, while tourism stock prices diverge away from their fundamental values from time to time, there exists an error correction mechanism in the market that allows tourism stock prices to revert their mean towards their fundamental values.

Barrows and Naka (1994), Chen, Kim, and Kim (2005) and Chen (2006a) investigate the impact of economic forces on hospitality stock returns. Barrows and Naka (1994) use the OLS regression to assess the effect of five selected macroeconomic variables on stock returns of US hospitality firms. They demonstrate that growth rates of money supply and domestic consumption have positive effects on hotel stock returns and expected inflation rate has a negative impact on hotel stock returns.

Chen et al., (2005) examine the influences of both economic and non-economic forces on hotel stock returns in Taiwan. Empirical results show that two economic variables, money supply and unemployment rate, significantly affect hotel stock returns. Moreover, non-macro-economic factors, namely presidential elections, the 9/21 earthquake, the outbreak of SARS, sports mega-events, the Asian financial crisis, and the 9/11 terrorist attacks, have significant effects on hotel stock returns.

Chen (2006a) extends the examination of the relationship between macro and non-macro explanatory variables and hotel stock returns to the emerging stock market of China. In consideration of a tremendous growth of tourism in China, Chen includes growth rate of total foreign tourist arrivals, in conjunction with other commonly used macro-economic variables, as another critical macro factor that may affect Chinese hotel stock returns, in his study. Evidence shows that Chinese hotel stock returns are more sensitive to general macro variables. The impact of growth rate of tourist arrivals is positive but not significant. Several non-macro forces, financial crises, natural disasters, political events, sports mega-events, terrorist attacks and wars, are also found to be significant to Chinese hotel stock returns.

Nonetheless, no work to date in the hospitality and tourism literature empirically investigate the long-run relationship and causality between business conditions and financial performance of tourism firms. Thus, the objective of this study is to fill in this gap. The empirical evidence from China and Taiwan can shed light on the unexplored interactions between business conditions and financial performance of tourism firms. In specific, we examine whether financial performance of tourism firms is important to business development and whether business conditions matter to financial success of tourism firms.

3. Data

Following Ezzemel (1992), Nicolau (2002), and Chen and Bin (2001), we use stock prices of tourism firms as the proxy for their respective financial performance. Based on the Taiwan Stock Exchange (TSE) classification for tourism industry sector, six tourism firms, Ambassador Hotel, First Hotel, Grant Formosa Regent Taipei, Hotel Holiday Garden, Leofoo Corporation, and Wan-Hwa Corporation, are currently listed on the TSE.

A firm has to have complete trading data available and an established trading period of at least 70 months to be included in the sample. As a result, the stock of Grant Formosa Regent Taipei, listed on the TSE since March 9, 1998, is excluded from the study. On the other hand, to broaden the range of tourism firms and increase sample size, China Airlines, satisfying the selection criterion above with its stocks being traded on the TSE since February 1993, is included in this study. Table 1 presents the descriptive financial statistics of tourism firms in Taiwan. All monthly stock prices of these firms are obtained from the financial database of the Taiwan Economic Journal (TEJ).

The stock exchanges in China are relatively new. Their launch was part of the economic reform intended to transform the Chinese economy from a centrally planned system to a socialist-market system. Under the new system, the Chinese government seeks to use the newly launched market to further develop the economy, while maintaining some socialist characteristics. Two stock exchanges, the Shanghai Stock Exchange and the Shenzhen Stock Exchange, exist in China. They are founded in December 1990 and July 1991, respectively. Both are expanding quickly in terms of market capitalization, trading volumes, and number of stocks listed since their inception.

There are two types of shares, A and B, listed on the two Chinese stock exchanges. A shares are denominated in the local currency (Renminbi, RMB). B shares are denominated in US dollars on the Shanghai Stock Exchange and Hong Kong dollars on the Shenzhen Stock Exchange. Foreign individuals or institutions are not allowed to buy or sell A shares. The market for B shares has not been
expanding as rapidly as that for A shares. The market capitalization, number of stocks listed, and turnover for A shares are almost 10 times the corresponding figures for B shares.

Both the Shanghai Stock Exchange and the Shenzhen Stock Exchange group tourism firms in the Social Service industry sector. Based on the same selection process used earlier for the case of Taiwan, Century Plaza Hotel, Cyts Tours, Dong Feng Hotel, Huangshan Tourism, Huatian Hotel, Jingxi Tourism, Jinjiang Hotel, Xian Tourism, and Eastern Airlines are included in this study. Cyts Tours, Huangshan Tourism, Jinjiang Hotel, and Eastern Airlines are listed on the Shanghai Stock Exchange, while Century Plaza Hotel, Dong Feng Hotel, Huatian Hotel, Jingxi Tourism, and Xian Tourism are listed on the Shenzhen Stock Exchange.

Quarterly data on gross domestic product (GDP) are commonly used as the proxy for business conditions. In addition to GDP, industrial production (IP) is another popular measure (Chen, 1991; Estrella & Hardouvelis, 1991; Fama & French, 1989; Miffre, 2001; Chen, 2005). IP measures business development that is more narrowly focused on the manufacturing side of the economy. The advantage of using IP data is that IP is a monthly measure, which in turn can provide more observations. Given that time series data of stock prices of tourism firms in both China and Taiwan are only available over a limited time

### Table 1
Descriptive financial statistics of tourism firms in Taiwan

| Tourism firms (Taiwan) | Sample size (month/year) | Price per share (in NT$) | Shares outstanding (in million) | Market capitalization (in million NT$) |
|------------------------|--------------------------|--------------------------|-------------------------------|-------------------------------------|
| Ambassador Hotel       | 12/1982-01/2004          | 15.40                    | 358                           | 5513                                |
| First Hotel            | 6/1991-01/2004           | 20.30                    | 153                           | 3105                                |
| Hotel Holiday Garden   | 6/1965-01/2004           | 10.50                    | 64                            | 672                                 |
| Leefoo Corporation     | 12/1988-01/2004          | 13.65                    | 265                           | 3617                                |
| Wain-Hwa Corporation   | 1/1971-01/2004           | 13.20                    | 228                           | 3010                                |
| China Airlines         | 2/1993-01/2004           | 18.40                    | 2049                          | 52422                               |

*Note: The market capitalization is denominated in New Taiwan dollar (NT$) and all numbers are as of the end of January 2004. All the six firms are listed on the Taiwan Stock Exchange.*

### Table 2
Descriptive financial statistics of tourism firms in China

| Tourism firms | Sample size (month/year) | Price per share (in RMB) | Shares outstanding (in million) | Market capitalization (in million RMB) |
|---------------|--------------------------|--------------------------|-------------------------------|-------------------------------------|
| Shanghai Stock Exchange
Cyts Tours     | 12/1997-09/2003          | 8.19                     | 267                           | 2187                                |
Eastern Airlines| 11/1997-09/2003          | 4.08                     | 300                           | 13464                               |
Huangshan Tourism | 5/1967-09/2003       | 7.86                     | 199                           | 1563                                |
Jinjiang Hotel  | 10/1996-09/2003          | 7.48                     | 447                           | 3345                                |
Shenzhen Stock Exchange
Century Plaza Hotel | 1/1994-09/2003    | 5.90                     | 288                           | 1698                                |
Dong Feng Hotel | 11/1993-09/2003          | 4.83                     | 270                           | 1303                                |
Huatian Hotel   | 8/1996-09/2003           | 9.49                     | 173                           | 1640                                |
Jingxi Tourism  | 1/1998-09/2003           | 9.69                     | 116                           | 1126                                |
Xian Tourism    | 9/1996-09/2003           | 6.47                     | 168                           | 1084                                |

*Note: The market capitalization is denominated in the local currency, i.e. Renminbi (RMB), and all numbers are as of the end of September 2003. Cyts Tours, Huangshan Tourism, Jinjiang Hotel, and Eastern Airlines are listed on the Shanghai Stock Exchange, while Century Plaza Hotel, Dong Feng Hotel, Huatian Hotel, Jingxi Tourism, and Xian Tourism are listed on the Shenzhen Stock Exchange.*
span in this study, we hence use both \( IP \) and \( GDP \) to carry out the empirical examination. Both Taiwanese \( IP \) and \( GDP \) data are taken from the TEJ database and Chinese \( IP \) and \( GDP \) data are obtained from various issues of the China statistical yearbook. All \( IP \) and \( GDP \) data used in the examination are seasonally adjusted and the selected time periods of \( IP \) and \( GDP \) are identical to the time periods of stock prices of tourism firms for both cases of China and Taiwan, respectively.

To provide a comparison of results between the two sample countries, we further create a sub-sample for the case of Taiwan, covering the period from January 1998 to 2004. Accordingly, we can conduct all empirical tests for China and Taiwan over the same time periods. Before testing a long-run equilibrium relationship between business conditions and financial performance of tourism firms, we use the Augmented Dickey and Fuller (1981) and Phillips and Perron (1988) unit root tests to examine the degree of integration of all variables in their natural logarithms. Let \( L\text{IP}, L\text{GDP}, \text{and} L\text{SPI} \) denote industrial production, gross domestic product, and various hospitality stock prices in natural logarithms, respectively. The coefficient in the log function simply implies a percentage change in the dependent variable given a percentage change in the independent variable.

Monthly and quarterly results of the Augmented Dickey–Fuller and the Phillips–Perron unit root tests are reported in Tables 3 and 4, respectively. Test results generally indicate that the null hypothesis of one unit root cannot be rejected for levels of monthly \( L\text{SPI} \), monthly \( L\text{SPI} \), quarterly \( L\text{GDP} \), or quarterly \( L\text{SPI} \), but is rejected for their first differences. One exception is that the null hypothesis is rejected for both level and first difference of quarterly \( L\text{SPI} \) of the Huatian hotel in China. In other words, quarterly \( L\text{SPI} \) of the Huatian hotel is \( I(0) \) and all other time-series data of \( L\text{IP}, L\text{GDP}, \text{and} L\text{SPI} \) are \( I(1) \) for their levels; however, all variables are \( I(0) \) for their first differences. Therefore, we proceed with the long-run equilibrium analysis using the Johansen’s (1988) cointegration techniques. For the Huatian hotel, quarterly \( L\text{SPI} \) and \( L\text{GDP} \) are of different integration orders and hence cannot be cointegrated.

4. Cointegration tests

We apply the Johansen cointegration test to the examination of the long-run relationship between business conditions and financial performance of tourism firms. The maximum likelihood procedure by Johansen has good large- and finite-sample properties (Cheung & Lai, 1993;
Gonzalo, 1994; Phillips, 1991). Cheung and Ng (1998) reported that the Johansen approach is more efficient than the two-step approach of Engle and Granger (1987). Indeed, these distinct characteristics of Johansen approach are pretty useful for this study, especially considering the fact that stock prices of tourism firms are only available over a limited time period of 7–10 years for the case of China.

If cointegration test results show that \( LIP \) and \( LSPI \) are cointegrated, we can state that the business condition and financial performance of tourism firms tend to move together in the long run, while experiencing short-run transitory deviations from this long-run relationship. To illustrate the vector autoregression (VAR)-based cointegration test of Johansen, consider that \( X_t \) is a \( k \)-vector of non-stationary \( I(1) \) variable. An \( k \)-dimensional VAR of order \( n \) can be expressed as a vector error correction model

\[
\Delta X_t = A + \sum_{i=1}^{n-1} \Gamma_i \Delta X_{t-i} + \Pi X_{t-1} + E_t,
\]

where \( A \) is a vector of constants that allows for a deterministic drift, \( \Delta \) is the difference operator, \( E \) is a white noise vector, the coefficient matrix \( \Pi = \sum_{i=1}^{k} A_i - I \), and \( \Gamma_i = -\sum_{j=i+1}^{k} A_j \). The Johansen’s method determines the cointegrating rank \( r \), \( 0 \leq \text{rank}(\Pi) = r < k \) and the long-run relationship, \( \Gamma = \alpha \beta' \). The \( k \times r \) matrices \( \beta \) and \( \alpha \) represent the long-run coefficients and error-correction estimates, respectively.

The vector error correction model is a VAR that builds on cointegration by incorporating error correction terms that account more fully for short-run dynamics and hence if the long-run equilibrium condition (cointegration) exists, it explains short-run fluctuations in variables \( X \). Two likelihood ratio test statistics, the trace statistic, \( \hat{\lambda}_{\text{trace}} \), and the maximum eigenvalue statistic, \( \lambda_{\text{max}} \), are computed as:

\[
\hat{\lambda}_{\text{trace}} = -T \sum_{i=r+1}^{k} \ln \left( 1 - \hat{\lambda}_i \right) \quad \text{and} \quad \lambda_{\text{max}} = -T \ln \left( 1 - \hat{\lambda}_{r+1} \right),
\]

where \( \hat{\lambda}_i \) is the \( i \)th largest eigenvalue of the \( \Gamma \) matrix and \( T \) is the sample size actually used for estimation. Osterwald-Lenum (1992) provides a complete set of asymptotic critical values for the Johansen’s test. The optimal lag \( n \) is determined with the smallest Akaike Information Criterion (AIC, Judge, Griffiths, Hill, Lutkepohl, & Lee, 1985) and Schwartz Bayesian Criterion (SBC, Schwarz, 1978). Respective monthly and quarterly results of the cointegration tests between business conditions and financial performance of tourism firms are shown in Tables 5 and 6.
Table 5
Tests results of cointegration between monthly \textit{LIP} and \textit{LSPI}

| The null hypothesis         | Trace statistic $r = 0$ | $r \leq 1$ | Maximum eigenvalue statistic $r = 0$ | $r = 1$ |
|-----------------------------|-------------------------|------------|-------------------------------------|--------|
| \textit{Taiwan}             |                         |            |                                     |        |
| Ambassador Hotel [2]        | 24.63**                 | 3.25       | 21.38**                             | 3.25   |
| Cys Tours [1]               | 24.95**                 | 3.45       | 22.22**                             | 2.63   |
| Dong Feng Hotel [1]         | 23.98**                 | 1.15       | 22.84**                             | 1.15   |
| Huangshan Tourism [2]       | 25.92**                 | 10.64**    | 15.28*                              | 10.64**|
| Huatian Hotel [1]           | 19.97*                  | 1.16       | 18.81**                             | 1.16   |
| Jingxi Tourism [1]          | 23.63**                 | 6.78**     | 16.84*                              | 6.78** |
| Xian Tourism [1]            | 22.60*                  | 4.19*      | 18.41*                              | 4.19** |
| Eastern Airlines [1]        | 17.48*                  | 4.09*      | 14.39*                              | 4.09** |
| \textit{VWTI SH} [1]        | 22.21**                 | 3.07       | 19.14**                             | 3.07   |
| \textit{VWTI SZ} [1]        | 17.38*                  | 1.88       | 15.50*                              | 1.88   |
| \textit{VWTI SHSZ} [1]      | 21.95*                  | 2.85       | 19.10*                              | 2.85   |

Note: $r$ is the hypothesized number of the cointegrating equation. The optimal lags selected with AIC and SBC are in bracket. Respective Osterwald-Lenum (1992) critical values of trace test for rejection of the null hypothesis of no cointegration are 20.04 ($r = 0$) and 3.76 ($r \leq 1$) at the 5% level. Respective critical values of the maximum eigenvalue test for rejection of the null hypothesis are 16.63 ($r = 0$) and 6.65 ($r \leq 1$) at the 1% level and 14.07 ($r = 0$) and 3.76 ($r \leq 1$) at the 5% level. The symbols (*) and (**) indicate that the null hypothesis can be rejected at the 5% and 1% levels, respectively.

Table 6
Tests results of cointegration between quarterly \textit{LGDP} and \textit{LSPI}

| The null hypothesis         | Trace statistic $r = 0$ | $r \leq 1$ | Maximum eigenvalue statistic $r = 0$ | $r = 1$ |
|-----------------------------|-------------------------|------------|-------------------------------------|--------|
| \textit{Taiwan}             |                         |            |                                     |        |
| Ambassador Hotel [5]        | 26.14**                 | 5.35*      | 20.79**                             | 5.35*  |
| First Hotel [6]             | 20.17**                 | 2.84*      | 17.33**                             | 2.84   |
| Hotel Holiday Garden [5]    | 21.46**                 | 4.29*      | 17.17*                              | 4.29*  |
| Huangshan Tourism [1]       | 7.93                    | 2.57       | 5.36                                | 2.57   |
| Huatian Hotel [3]           | —                       | —          | —                                   | —      |
| Jingxi Tourism [2]          | 8.66                    | 2.97       | 5.70                                | 2.97   |
| Jinjiang Hotel [3]          | 25.48**                 | 3.81*      | 21.67**                             | 3.81*  |
| Xian Tourism [1]            | 9.53                    | 2.19       | 7.34                                | 2.19   |
| Eastern Airlines [3]        | 17.26*                  | 5.94*      | 14.32*                              | 5.94*  |
| \textit{VWTI SH} [2]        | 18.10*                  | 3.20       | 14.90**                             | 3.20   |
| \textit{VWTI SZ} [3]        | 16.80*                  | 5.08*      | 14.27*                              | 5.08*  |
| \textit{VWTI SHSZ} [3]      | 38.35**                 | 14.83**    | 23.52**                             | 14.83**|

Note: Same as in Table 5.
For tourism firms in Taiwan, both trace and maximum eigenvalue tests in Table 5 indicate the existence of one cointegrating equation between \( LIP \) and \( LSPI \) of the Ambassador Hotel, First Hotel, Leoofoo Corporation, Hotel Holiday Garden, Wan-Hwa Corporation and VWTI at the 5\% level, one cointegrating equation between \( LIP \) and \( LSPI \) of the China Airlines at the 1\% level, but no existence of cointegration between \( LIP \) and \( LSPI \) of the First Hotel. It is also found that there exists at least one cointegrating equation between \( LGDP \) and \( LSPI \) of all firms, based on both test results in Table 6. Moreover, we also detect that there is one cointegration between \( LIP \) and \( LSPI \) at the 5\% level and two cointegrating equations between \( LGDP \) and \( LSPI \) at the 5\% level over the recent sample of VWTI.

For all stock price indexes of tourism firms in China, both test results indicate at least one cointegrating equation between \( LIP \) and \( LSPI \) at the 5\% level. We also find that there is at least one cointegration between \( LGDP \) and \( LSPI \) of the Century Plaza Hotel, Cyt's Tours, Dong Feng Hotel, Jinjiang Hotel, Eastern Airlines, VWTI_SH, VWTI_SZ, and VWTI_SHSZ, but no cointegration between \( LGDP \) and \( LSPI \) of the Huangshan Tourism, Jingxi Tourism and Xian Tourism. In summary, the Johansen cointegration test generally support the first hypothesis that there is a long-run equilibrium relationship between business conditions and financial performance for the majority of tourism firms and for the tourism group as a whole in both Taiwan and China.

5. A causality analysis

5.1. Granger causality tests

If two time-series variables are cointegrated, then at least a Granger-causation in one direction exists (Engle & Granger, 1987; Granger, 1988). The existence of a long-run relationship between business conditions and tourism firms’ financial performance implies that two variables are causally related at least in one direction. In a cointegrated set of variables, Granger (1988) proposes that the short-run causal links between these variables should be tested within the framework of the vector error-correction model.

Thus, to examine the direction of causation, we perform the Granger causality tests augmented with an appropriate error-correction term derived from the cointegrating relationship between business conditions and financial performance of tourism firms. The appropriate formulation of a Granger-type test of causality is given as

\[
\Delta LBC_t = \varepsilon_1 + \sum_{i=1}^{m} \beta_{1i} \Delta LBC_{t-i} + \sum_{i=1}^{m} \lambda_{1i} \Delta LSPI_{t-i} + \theta_1 ECT_{t-1} + \varepsilon_{1t},
\]

(5)

\[
\Delta LSPI_t = \varepsilon_2 + \sum_{i=1}^{m} \beta_{2i} \Delta LBC_{t-i} + \sum_{i=1}^{m} \lambda_{2i} \Delta LSPI_{t-i} + \theta_2 ECT_{t-1} + \varepsilon_{2t},
\]

(6)

where \( \varepsilon_1 \) is the deterministic component, \( \Delta \) is the difference operator, \( LBC \) denotes \( IP \) or \( GDP \) in natural logarithm, \( LSPI \) is \( SPI \) in natural logarithm, \( \varepsilon_t \) are white noises, and \( ECT \) is the error-correction term derived from the cointegrating equation between \( LIP \) and \( LSPI \). The optimal lag \( m \) is selected with the smallest AIC and SBC.

Granger (1988) notes that a vector error-correction model provides two channels through which the causality can be detected. This procedure hence has the advantage that source of causation can be identified by either short-run dynamics or disequilibrium adjustment. First, the evidence of causality is identified through short-run dynamics. Based on this channel, statistics of the Wald test are computed under the null hypothesis that all the coefficients of \( \lambda_{1i} \) and \( \beta_{2i} \) in Eqs. (5) and (6) are equal to zero. In other words, we support the Proposition 1 of one-way causality from business conditions to tourism firms’ financial performance (\( \Delta LBC \Rightarrow \Delta LSPI \)) if \( \beta_{21} = \beta_{22} = \cdots = \beta_{2m} = 0 \) is rejected; we accept the Proposition 2 of one-way causality from tourism firms’ financial performance to business conditions (\( \Delta LSPI \Rightarrow \Delta LBC \)) if \( \lambda_{11} = \lambda_{12} = \cdots = \lambda_{1m} = 0 \) is rejected; there exists a two-way causality between business conditions and financial performance of tourism firms (\( \Delta LBC \Leftrightarrow \Delta LSPI \)) if both \( \beta_{21} = \beta_{22} = \cdots = \beta_{2m} = 0 \) and \( \lambda_{11} = \lambda_{12} = \cdots = \lambda_{1m} = 0 \) are rejected.

Second, the causality is identified through the disequilibrium mechanism, that is, through the lagged \( ECT \) term. Independent variables “Granger-cause” the dependent variable if the error-correction term in Eqs. (5) and (6) is statistically significant. For example, \( \Delta LBC \) Granger causes \( \Delta LSPI \) (\( \Delta LBC \Rightarrow \Delta LSPI \)) if \( \theta_1 \) is significantly different from zero in Eq. (5). Similarly, \( \Delta LSPI \) Granger causes \( \Delta LBC \) (\( \Delta LSPI \Rightarrow \Delta LBC \)) if \( \theta_2 \) is statistically significant in Eq. (6). Following the same argument, the two variables Granger cause each other (\( \Delta LBC \Leftrightarrow \Delta LSPI \)) if both \( \theta_1 \) and \( \theta_2 \) are significantly different from zero. According to Granger (1988), at least one variable in Eqs. (5) and (6) should move to bring the relation back into equilibrium if there is a true economic relation, and thus at least one of the coefficients (\( \theta_1 \) and \( \theta_2 \)) of the error correction terms has to be significantly different from zero.

Note when \( LBC \) and \( LSPI \) are of different integration orders or \( LBC \) and \( LSPI \) are not cointegrated, the examination of the direction of causation is based on the standard Granger (1969) causality tests:

\[
\Delta LBC_t = \varepsilon_1 + \sum_{i=1}^{l} \beta_{1i} \Delta LBC_{t-i} + \sum_{i=1}^{l} \lambda_{1i} \Delta LSPI_{t-i} + \varepsilon_{1t},
\]

(7)
\[ \Delta \text{LSPI}_t = \alpha_2 + \sum_{i=1}^l \beta_{2i} \Delta \text{LBC}_{t-i} + \sum_{i=1}^l \gamma_{2i} \Delta \text{LSPI}_{t-i} + v_{2t}. \] (8)

The causality will be tested only through the first channel, using the Wald test. Results of causality tests, along with Wald test statistics and \( t \)-statistics on error-correction term, are reported in Tables 7–10 and are summarized as follows.

First, empirical results associated with the case of Taiwan covered in Table 7 demonstrate that there is a bi-directional causality between \( \Delta \text{LIP} \) and \( \Delta \text{LSPI} \) in general. We find that this two-way causality exists in five out of six individual tourism firms and no causality, neither in the short- nor in the long-run, is detected for the case of the First hotel. The two-way causality consistently holds for tourism firms as a whole for both the full and recent samples.

Second, mixed results are detected in Table 8, which covers the case of Taiwan also and utilizes a bivariate system of \( \Delta \text{LGDP} \) and \( \Delta \text{LSPI} \). There is a one-way long-run causality running from \( \Delta \text{LSPI} \) to \( \Delta \text{LGDP} \) for three firms (the Ambassador hotel, First hotel, and Hotel Holiday Garden), a one-way causality running from \( \Delta \text{LGDP} \) to \( \Delta \text{LSPI} \) for the Wan-Hwa corporation, and a bi-directional causality between the same two factors for the China Airlines. By taking all tourism firms as a whole, we still find a two-way causality for both the full and recent samples. In sum, empirical findings imply that good financial performance of tourism firms can improve business conditions and healthy business conditions can enhance financial performance of tourism firms in Taiwan.

Table 9 shows that a bi-directional causality between \( \Delta \text{LIP} \) and \( \Delta \text{LSPI} \) exists in two out of four tourism firms listed on the Shanghai Stock Exchange and the other two firms exhibit a one-way causality from \( \Delta \text{LSPI} \) to \( \Delta \text{LIP} \). A two-way causality is evidenced for the four tourism firms as a whole. As for the five Chinese tourism firms listed on the Shenzhen Stock Exchange, empirical results presented in Table 9 support a bi-directional causality between \( \Delta \text{LIP} \) and \( \Delta \text{LSPI} \) in three of them and a one-way causality from \( \Delta \text{LSPI} \) to \( \Delta \text{LIP} \) in the other two. For all five firms as a group, a one-way causality running from \( \Delta \text{LSPI} \) to \( \Delta \text{LIP} \) is evidenced. Moreover, a two-way causality between \( \Delta \text{LIP} \) and \( \Delta \text{LSPI} \) is revealed for nine tourism firms all together.

Similarly, tests based on \( \Delta \text{LGDP} \) and \( \Delta \text{LSPI} \) presented in Table 10 for individual firms produce mixed results. Taking as a whole all individual tourism firms listed on the Shanghai Stock Exchange and Shenzhen Stock Exchange, respectively, we find a one-way causality from \( \Delta \text{LGDP} \) to \( \Delta \text{LSPI} \) for both value-weighted tourism indexes. However, when all nine firms are taken as a whole, tests result shows a bi-directional causality between \( \Delta \text{LGDP} \) and \( \Delta \text{LSPI} \).

Given all results covered in this section, we conclude that business conditions and financial performance of tourism firms enhance each other in both Taiwan and China. Furthermore, when taking all tourism firms as a group in both Taiwan and China, we generally find that estimates of \( \theta_1 \), \( \theta_0 \), and \( \theta_2 \), the speed of adjustment to restore equilibrium in the dynamic model, are statistically significant and negative. These results imply that the estimated long-run links between business conditions and financial performance of tourism firms are indeed structural and the two variables would tend to revert back to their long-run relationship although they may temporarily deviate from the long-run relationship.

| Company                      | Causality                | Wald test statistic | \( t \)-statistic | Result                      |
|------------------------------|--------------------------|--------------------|-------------------|-----------------------------|
| Ambassador Hotel             | \( \Delta \text{LSPI} \rightarrow \Delta \text{LIP} \) | 0.32               | —                 | \(-1.88^*\) \( \Delta \text{LSPI} \leftrightarrow \Delta \text{LIP} \) |
|                             | \( \Delta \text{LIP} \rightarrow \Delta \text{LSPI} \) | —                  | 1.85              | \(-2.32^{**}\) \( \Delta \text{LSPI} \leftrightarrow \Delta \text{LIP} \) |
| First Hotel                  | \( \Delta \text{LSPI} \rightarrow \Delta \text{LIP} \) | 1.38               | —                 | —                           |
|                             | \( \Delta \text{LIP} \rightarrow \Delta \text{LSPI} \) | —                  | 1.07              | —                           |
| Hotel Holiday Garden         | \( \Delta \text{LSPI} \rightarrow \Delta \text{LIP} \) | 0.08               | —                 | \(-2.49^{**}\) \( \Delta \text{LSPI} \leftrightarrow \Delta \text{LIP} \) |
|                             | \( \Delta \text{LIP} \rightarrow \Delta \text{LSPI} \) | 0.08               | 0.04              | \(-3.47^{***}\) \( \Delta \text{LSPI} \leftrightarrow \Delta \text{LIP} \) |
| Leofoo Corporation           | \( \Delta \text{LSPI} \rightarrow \Delta \text{LIP} \) | 5.27*              | —                 | \(-1.62\) \( \Delta \text{LSPI} \leftrightarrow \Delta \text{LIP} \) |
|                             | \( \Delta \text{LIP} \rightarrow \Delta \text{LSPI} \) | —                  | 8.56**            | \(-3.93^{***}\) \( \Delta \text{LSPI} \leftrightarrow \Delta \text{LIP} \) |
| Wan-Hwa Corporation          | \( \Delta \text{LSPI} \rightarrow \Delta \text{LIP} \) | 0.23               | —                 | \(-2.12^{**}\) \( \Delta \text{LSPI} \leftrightarrow \Delta \text{LIP} \) |
|                             | \( \Delta \text{LIP} \rightarrow \Delta \text{LSPI} \) | —                  | 2.45              | \(-3.45^{***}\) \( \Delta \text{LSPI} \leftrightarrow \Delta \text{LIP} \) |
| China Airlines               | \( \Delta \text{LSPI} \rightarrow \Delta \text{LIP} \) | 1.68               | —                 | \(-1.92^{**}\) \( \Delta \text{LSPI} \leftrightarrow \Delta \text{LIP} \) |
|                             | \( \Delta \text{LIP} \rightarrow \Delta \text{LSPI} \) | —                  | 2.29              | \(-3.82^{***}\) \( \Delta \text{LSPI} \leftrightarrow \Delta \text{LIP} \) |
| VWTI (full sample)           | \( \Delta \text{LSPI} \rightarrow \Delta \text{LIP} \) | 4.38               | —                 | \(-2.81^{**}\) \( \Delta \text{LSPI} \leftrightarrow \Delta \text{LIP} \) |
|                             | \( \Delta \text{LIP} \rightarrow \Delta \text{LSPI} \) | —                  | 0.27              | \(-1.90^*\) \( \Delta \text{LSPI} \leftrightarrow \Delta \text{LIP} \) |
| VWTI (1/1998-9/2003)         | \( \Delta \text{LSPI} \rightarrow \Delta \text{LIP} \) | 3.27               | —                 | \(-2.73^{**}\) \( \Delta \text{LSPI} \leftrightarrow \Delta \text{LIP} \) |
|                             | \( \Delta \text{LIP} \rightarrow \Delta \text{LSPI} \) | —                  | 0.53              | \(-1.83^*\) \( \Delta \text{LSPI} \leftrightarrow \Delta \text{LIP} \) |

Note: The symbols (*), (**), and (***) indicate significance at the 10%, 5% and 1% levels, respectively.
5.2. Variance decompositions and impulse-response functions

This section shows the relative importance of each variable in explaining the other variable by using impulse-response functions and variance decompositions. Considering Eqs. (5) and (6) or Eqs. (7) and (8) in the model, a change in one of the random innovations will immediately change the value of the dependent variable and hence the future values of the other variable, through the dynamic structure of the system. The analysis of impulse response functions can illustrate the response of one of the
endogenous variables to a one-unit shock (one standard deviation) in one of the other variables in the model, while the analysis of variance decompositions breaks down the forecast-error variance of one variable in each future period and determine the percentage of variance that variable in the model explains. Figs. 1–4 plot the resulting impulse-response functions and Table 11 reports the variance decompositions.

As shown in Fig. 1 for the case of Taiwan, changes in business conditions ($\Delta LIP$) show higher response to a one-unit shock in their own innovations. Similarly, changes in financial performance of tourism firms ($\Delta LSPI$) also show higher response to their own innovation shocks. Effects of unit shocks are found to be small and to decay fairly quickly. Similar results for the case of China are evidenced in Fig. 2. Both $\Delta LIP$ and $\Delta LSPI$ show higher response to

Table 10
Results of Granger causality tests between quarterly $\text{LGDP}$ and $\text{LSPI}$: China

| Company          | Causality                  | Wald test statistic | t-statistic | Result                  |
|------------------|-----------------------------|---------------------|-------------|-------------------------|
|                  | $\Delta LSPI \rightarrow \Delta LGDP$ | 3.86                | -1.04       | $\Delta LGDP \rightarrow \Delta LSPI$ |
|                  | $\Delta LGDP \rightarrow \Delta LSPI$ | 2.30                | -3.83***    | $\Delta LGDP \rightarrow \Delta LSPI$ |
| Huangshan Tourism| $\Delta LSPI \rightarrow \Delta LGDP$ | 1.14                | -            | $\Delta LGDP \rightarrow \Delta LSPI$ |
|                  | $\Delta LGDP \rightarrow \Delta LSPI$ | 5.69**              | -            | $\Delta LGDP \rightarrow \Delta LSPI$ |
| Jinjiang Hotel   | $\Delta LSPI \rightarrow \Delta LGDP$ | 1.44                | 0.05        | $\Delta LGDP \rightarrow \Delta LSPI$ |
|                  | $\Delta LGDP \rightarrow \Delta LSPI$ | 3.40                | -4.76***    | $\Delta LGDP \rightarrow \Delta LSPI$ |
| Eastern Airlines | $\Delta LSPI \rightarrow \Delta LGDP$ | 7.22*               | -1.79**     | $\Delta LGDP \rightarrow \Delta LSPI$ |
|                  | $\Delta LGDP \rightarrow \Delta LSPI$ | 8.66**              | 1.45        |  |
| VWTI SH          | $\Delta LSPI \rightarrow \Delta LGDP$ | 2.72                | 0.85        | $\Delta LGDP \rightarrow \Delta LSPI$ |
|                  | $\Delta LGDP \rightarrow \Delta LSPI$ | 2.70                | -3.51***    | $\Delta LGDP \rightarrow \Delta LSPI$ |
| Century Plaza Hotel | $\Delta LSPI \rightarrow \Delta LGDP$ | 1.31                | -2.10**     | $\Delta LGDP \rightarrow \Delta LSPI$ |
|                  | $\Delta LGDP \rightarrow \Delta LSPI$ | 1.57                | -1.51       |  |
| Dong Feng Hotel  | $\Delta LSPI \rightarrow \Delta LGDP$ | 2.17                | 0.77        | $\Delta LGDP \rightarrow \Delta LSPI$ |
|                  | $\Delta LGDP \rightarrow \Delta LSPI$ | 2.30                | -2.23**     | $\Delta LGDP \rightarrow \Delta LSPI$ |
| Huatian Hotel    | $\Delta LSPI \rightarrow \Delta LGDP$ | 0.43                | -           | $\Delta LGDP \rightarrow \Delta LSPI$ |
|                  | $\Delta LGDP \rightarrow \Delta LSPI$ | 0.09                | -           | $\Delta LGDP \rightarrow \Delta LSPI$ |
| Jingxi Tourism   | $\Delta LSPI \rightarrow \Delta LGDP$ | 3.51*               | -           | $\Delta LGDP \rightarrow \Delta LSPI$ |
|                  | $\Delta LGDP \rightarrow \Delta LSPI$ | 0.47                | -           | $\Delta LGDP \rightarrow \Delta LSPI$ |
| Xian Tourism     | $\Delta LSPI \rightarrow \Delta LGDP$ | 0.91                | -           | $\Delta LGDP \rightarrow \Delta LSPI$ |
|                  | $\Delta LGDP \rightarrow \Delta LSPI$ | 3.07*               | -           | $\Delta LGDP \rightarrow \Delta LSPI$ |
| VWTI SZ          | $\Delta LSPI \rightarrow \Delta LGDP$ | 1.36                | -1.36       | $\Delta LGDP \rightarrow \Delta LSPI$ |
|                  | $\Delta LGDP \rightarrow \Delta LSPI$ | 0.15                | -2.67**     | $\Delta LGDP \rightarrow \Delta LSPI$ |
| VWTI SHSZ        | $\Delta LSPI \rightarrow \Delta LIP$ | 8.64**              | -2.26**     | $\Delta LGDP \rightarrow \Delta LSPI$ |
|                  | $\Delta LIP \rightarrow \Delta LSPI$ | 17.93***            | -2.08**     |  |

Note: Same as in Table 7.
their own innovation shocks and effects of unit shocks are again small and decay fairly rapidly. Figs. 3 and 4 demonstrate that both ΔLGDP and ΔLSPI show higher response to their own innovation shocks as well. While effects of unit shocks are still small, they decay relatively slowly.

Panel A in Table 11 reports the percentage of forecast-error variance of changes in business conditions explained by changes in financial performance of tourism firms, whereas panel B presents the proportion of forecast-error variance of changes in financial performance of tourism firms that are attributable to changes in business condition. Results in Table 11 show that changes in financial performance of tourism firms (ΔLSPI) forecast a small portion of changes in business conditions (ΔLIP) in both China and Taiwan. Similarly, the percentage of forecast variance of ΔLSPI explained by ΔLIP is also small. In contrast, ΔLGDP plays an important role in forecasting variance of ΔLSPI in China and Taiwan. For the case of Taiwan, the proportion of forecast variance of ΔLSPI attributed to ΔLGDP is 14.3% in the first period, 18.6% in the second period, 27.3% in the fifth period, and converges to about 30% thereafter. In China, ΔLGDP explains 30.2–39.6% of the forecast variance of ΔLSPI. Convergence is fairly fast as we can see in Table 11, where the proportion explained in the first period is 30.2%.

6. Discussion and managerial implications

The empirical evidence presented in this study for China and Taiwan supports that business expansion and financial success of tourism firms reinforce each other. This finding
follows our hypotheses in the introduction section, in which we propose that a sound business condition can enhance financial success of business firms through more sales and earnings, while financial success of business firms can also contribute to business conditions by generating job opportunities, business turnover, and/or government taxes. This finding is also in line with Choi et al. (1999).

They show that the US hotel industry performance follows the US business cycle.

We further detect that gross domestic product plays a more critical role than industrial production in forecasting variance of financial performance of the tourism group as a whole in both China and Taiwan. As mentioned, industrial production measures business conditions closely tracking
the manufacturing sector, whereas gross domestic product covers both manufacturing and other service sectors. Thus, this finding suggests that overall financial performance of the tourism industry has close links to not only the manufacturing sector but also other service sectors.

Empirical findings in this study offer valuable information for tourism business managers and government tourism policymakers. Causality test results can help the government set priorities regarding where and how to allocate limited resources to improve overall business conditions. If one-way causality runs from tourism firms' financial performance to business conditions, more resources should be allocated to the tourism industry than to other sectors. If one-way causality from business conditions to tourism firms' financial performance is detected, the government should allocate resources to leading industries so that the overall economy will be improved, which would in turn boost the tourism industry. Resources should be equally allocated to tourism and other major industries if a two-way causality exists between the two variables. On the other hand, using enthusiastic tourism promotion or a strategic plan to improve the tourism industry and hence the overall economy will not be as effective as it is generally assumed, if there is no causality between business conditions and financial performance of tourism firms.

Recently, the tourism industry has been seriously damaged by the outbreak of SARS in China and especially in Taiwan. For example, after the Chinese Ministry of Health first reported that there had been 300 cases of SARS on February 11, 2003, the number of visitors to China decreased from 8,484,300 in January to 7,376,000 in February (a 6.08% drop), to 5,649,200 in April (a 17.66% drop since January), and to 5,436,000 in May (a total of 35.93% drop in four months). Chen (2006a) also reports that the SARS outbreak has a significantly negative impact on hotel stock returns in China. For the case of Taiwan, after the SARS outbreak on April 22, 2003, the number of visitors to Taiwan significantly dropped from 258,023 in March to 110,632 in April (a 57% drop) and to 40,250 in May (an 84% drop in 2 months). The China Post (2003) reported that the tourism-related industries such as hotels, restaurants, and theme parks were the most severely affected groups by the outbreak of SARS in Taiwan. The severe, negative impact of the SARS outbreak on the tourism industry was well reflected on its financial performance (stock prices). As shown in Fig. 5, the tourism industry, among all industries, experienced the highest monthly percentage drop in the share price index in the month after the SARS outbreak. Chen et al., (2005) further shows that SARS outbreak has much more damaging impact than any other non-macro events, such as the earthquake, wars, financial crisis, and the 9/11 terrorist attacks, on hotel stock returns in Taiwan. Moreover, Waugh (2003) estimates that Taiwanese economic growth in 2003 was cut by SARS by 0.5%. Given the finding that business expansion and financial success of tourism firms significantly reinforce each other in China and Taiwan, the local government authority should equally allocate resources to tourism and other major industries to enhance the tourism industry and the overall economy.

The International Olympic Committee members selected Beijing as the host city for the Games of the XXIX Olympiad in 2008 on July 13, 2001. The announcement was a momentous occasion for China. It is equivalently significant to China’s inbound tourism industry. Over the years, Olympics host cities and countries have organized various forms of tourism promotion in association with the Games. The Games would have a significantly positive impact on the tourism industry and, consequently, on the overall business climate and the national economy. However, Chen (2006a) finds that the announcement of the 2008 Beijing Olympics has a negative impact on hotel stock returns in China. Thus, the Chinese government and tourism authorities need to cautiously prepare for the Games, instead of expecting that a beneficial influence of the Olympics on both the tourism industry and overall economy would just happen automatically.

Chen et al. (2005) report that international sports mega-events, such as the 2000 Sydney Olympics and 2002 Japan/Korea World Cup, have a negative impact on hotel stock returns in Taiwan. As they noted, the negative impact of the Sydney Olympics is understandable, considering the geographical distance between the two nations. They also argue that Taiwan could have benefited from the 2002 Japan/Korea World Cup because of its proximity to Japan and South Korea and conclude that the negative effect might be attributed to the lack of sufficient efforts made to attract international visitors. Because evidence shows that financial success of tourism firms and business development promote each other in Taiwan, both its government
and private tourism organizations and marketers should strive to take advantage of the 2008 Beijing Olympics in China. For shopping lovers, Taiwan can be regarded as an excellent stopover destination because it provides various eatery choices and products. If enthusiastic tourism promotion or activities can attract international tourists to make a trip to Taiwan during the 2008 Olympics game period, the financial performance of tourism firms and the industry as a whole would be positively influenced, which in turn can boost the overall economy.

7. Conclusion and future research direction

While interactions between business conditions and financial performance of tourism firms are generally assumed on the basis of the fundamental stock valuation model, no empirical studies on this topic have been conducted. Whether robust financial performance of tourism firms can significantly promote business development and whether the improvement of business conditions can lead to financial success of tourism firms remain unknown. This study attempts to address these questions by examining the cointegration and causality between business conditions and financial performance of tourism firms in China and Taiwan.

The cointegration test results generally support a long-run relationship between business conditions and financial performance of tourism firms in both China and Taiwan. Causality tests results also show that there is a bi-directional causality between business expansion and financial performance of tourism firms as a whole for both cases. Therefore, financial success of tourism firms and business development enhance each other in China and Taiwan.

In conclusion, the significant contribution of financial success of tourism firms to business development is empirically documented in this study. This result also implies that financial performance of tourism firms can serve as a leading indicator of overall business development in China and Taiwan. However, it is worth noting that empirical findings in this study should be interpreted with caution since stock prices of tourism firms are only available over a limited time span, 7–10 years for the case of China and about 14 years for the case of Taiwan. More general conclusions can be drawn, if this research can be replicated with data from different countries. The long-run relationship and causality between business conditions and financial performance of tourism firms may be fundamentally different from country to country.

Lastly, the interactions between business conditions and financial performance of tourism firms may be linked to some macroeconomic factors. For instance, Chen et al. (2005) illustrate that macroeconomic forces such as monetary policy and unemployment rate significantly impact financial performance of Taiwanese hotels. Chen (2006a) finds that Chinese hotel stock returns are significantly associated with growth rates of industrial production, growth rates of imports, changes in discount rates, and changes in interest rates. In the future, tourism researchers can carry out the examination, using those economic factors.

Acknowledgments

I thank two anonymous referees and participants at the third Asia-Pacific CHRIE Conference 2005 (Kuala Lumpur, Malaysia) for their helpful comments.

References

Arestis, P., Demetriades, P. O., & Luintel, K. B. (2001). Financial development and economic growth: The role of stock markets. Journal of Money, Credit, and Banking, 33, 16–41.

Atje, R., & Jovanovic, B. (1993). Stock markets and development. European Economic Review, 37, 632–640.

Barro, R. J. (1990). The stock market and investment. Review of Financial Studies, 3, 115–131.

Barrows, C. W., & Naka, A. (1994). Use of macroeconomic variables to evaluate selected hospitality stock returns in the US. International Journal of Hospitality Management, 13, 119–128.

Beckers, S., Grinold, R., Rudd, A., & Stelke, D. (1992). The relative common factors across the European equity markets. Journal of Banking and Finance, 16, 75–95.

Bodie, Z., Alex, K., & Alan, M. J. (2001). Essentials of investments (5th ed.). New York: McGraw Hill.

Borde, S. F. (1998). Risk diversity across restaurants. Cornell Hotel and Restaurant Administration Quarterly(April), 64–69.

Chaney, P. K., Devinney, T. M., & Winer, R. S. (1991). The impact of new product introductions on the market value of firms. Journal of Business, 64, 573–610.

Chen, D. H., & Bin, F. S. (2001). Effects of legislation events on US gaming stock returns and market turnings. Tourism Management, 22, 539–549.

Chen, M. H. (2005). Stock returns and changes in the business cycle. Asia Pacific Management Review, in press.

Chen, M. H. (2006a). Macro and non-macro explanatory factors of Chinese hotel stock returns. Working Paper. National Chung Cheng University, Chia-Yi, Taiwan.

Chen, M. H. (2006b). On the mean reversion of tourism stock prices. Working Paper. National Chung Cheng University, Chia-Yi, Taiwan.

Chen, M. H., Jang, S. C., & Kim, W. G. (2006). The impact of SARS outbreak on Taiwanese hotel stock returns: An event study approach. International Journal of Hospitality Management, in press.

Chen, M. H., Kim, W. G., & Kim, H. J. (2005). The impacts of macroeconomic and non-economic forces on hotel stock returns. International Journal of Hospitality Management, 24, 243–258.

Chen, N. F. (1991). Financial investment opportunities and the macro-economy. Journal of Finance, 46, 529–554.

Chen, N. F., Roll, R., & Ross, S. A. (1986). Economic forces and the stock market. Journal of Business, 59, 383–403.

Cheung, Y. W., & Lai, K. S. (1993). Finite-sample sizes of Johansen’s likelihood ratio tests for cointegration. Oxford Bulletin of Economics and Statistics, 55, 313–328.

Cheung, Y. W., & Ng, L. K. (1998). International evidence on the stock market and aggregate economic activity. Journal of Empirical Finance, 5, 281–296.

China Post (2003). Taiwan’s import-export situation keeps inching upwards (on-line). July 21, http://www.chinapost.com.tw/archive/p_detail.asp?id=39520&GRP=1&onN.

Choi, J. G., Olsen, M. D., Kwansa, F. A., & Tse, E. C. Y. (1999). Forecasting industry turning points: The US hotel industry cycle model. International Journal of Hospitality Management, 18, 159–170.
Choi, J. J., Hauser, S., & Kopecky, K. J. (1999). Does the stock market predict real activity? times series evidence from the G-7 countries. *Journal of Banking and Finance*, 23, 1771–1792.

Dickey, D. A., & Fuller, W. A. (1981). Likelihood ratio statistics for autoregressive time series with a unit root. *Econometrica*, 49, 1057–1071.

Elgonemy, A. R. (2000). The pricing of lodging stocks: A reality check. *Cornell Hotel and Restaurant Administration Quarterly* (December), 18–28.

Engle, R. F., & Granger, C. W. J. (1987). Cointegration and error correction: Representation, estimation and testing. *Econometrica*, 50, 987–1007.

Estrella, A., & Hardouvelis, G. A. (1991). The term structure as a predictor of real economic activity. *Journal of Finance*, 46, 555–576.

Ezzemel, M. (1992). Business unit and divisional performance measurement. London: Academic Press.

Ezzemel, M., & Hart, M. (1989). *Advanced management accounting: An organization emphasis*. London: Casell.

Fama, E. F. (1981). Stock returns, real activity, inflation, and money. *American Economic Review*, 71, 545–565.

Fama, E. F., & French, K. R. (1988). Dividend yields and expected stock returns. *Journal of Financial Economics*, 22, 3–25.

Fama, E. F., & French, K. R. (1989). Business conditions and expected returns on stocks and bonds. *Journal of Financial Economics*, 25, 23–49.

Fase, M. M. G., & Abma, R. C. N. (2003). Financial environment and economic growth in selected Asian countries. *Journal of Asian Economics*, 14, 11–21.

Ferson, W. E., & Harvey, C. R. (1993). The risk and predictability of international equity returns. *Review of Financial Studies*, 6, 527–566.

Gonzalo, J. (1994). Comparison of five alternative methods of estimating long run equilibrium relationship. *Journal of Econometrics*, 60, 203–233.

Granger, C. W. J. (1969). Investigating causal relations by econometric models: cross spectral methods. *Econometrica*, 37, 424–438.

Granger, C. W. J. (1988). Some recent development in a concept of causality. *Journal of Econometrics*, 39, 199–211.

Gu, Z., & Kim, H. (2002). Determinants of restaurant systematic risk: A reexamination. *Journal of Hospitality Financial Management*, 10, 1–13.

Harris, R. D. F. (1997). Stock markets and development: A reassessment. *European Economic Review*, 41, 139–146.

Harvey, C. R. (1991). The term structure and world economic growth. *Journal of Fixed Income*, 1, 139–146.

Heiman, R. (1988). Effects of key issues on the financial performance of hospitality firms. *Hospitality Education and Research Journal*, 12, 83–90.

Jeon, S., Kang, I., & Lee, S. (2004). The relationship between persistence of abnormal earnings and usefulness of accounting information in hotel companies. *Tourism Management*, 25, 735–740.

Johansen, S. (1988). Statistical analysis of cointegration vectors. *Journal of Economic Dynamics and Control*, 12, 231–254.

Judge, G. G., Griffiths, W. E., Hill, R. C., Lutkepohl, H., & Lee, T. C. (1985). *The theory and practice of econometrics* (2nd ed.). Wiley: New York.

Kim, H., & Gu, Z. (2003). Risk-adjusted performance: a sector analysis of restaurant firms. *Journal of Hospitality & Tourism Research*, 27, 200–216.

King, R. G., & Levine, R. (1993a). Finance and Growth: Schumpeter may be right. *Quarterly Journal of Economics*, 108, 717–737.

King, R. G., & Levine, R. (1993b). Finance, entrepreneurship and Growth: Theory and evidence. *Journal of Monetary Economics*, 32, 515–542.

Levine, R. (1991). Stock markets growth, growth, and tax policy. *Journal of Finance*, 46, 1445–1465.

Levine, R., & Zervos, S. (1996). Stock market development and long-run growth. *World Bank Economic Review*, 10, 323–339.

Levine, R., & Zervos, S. (1998). Stock markets, banks, and economic growth. *World Bank Policy Research Working Paper*.

Mazar, E. A., & Alexander, R. J. (2001). Financial sector development and economic growth in New Zealand. *Applied Economic Letters*, 8, 545–549.

McWilliams, A., & Siegel, D. (1997). Event studies in management research: Theoretical and empirical issues. *Academy of Management Journal*, 40, 627–657.

Miffre, J. (2001). Economic activity and time variation in expected futures returns. *Economics Letters*, 73, 73–79.

Mishkin, F. S., & Eakins, S. G. (2003). *Financial markets and institutions* (4th ed.). Wiley: New York.

Nicolaus, J. L. (2002). Assessing new hotel openings through an event study. *Tourism Management*, 23, 47–54.

Osterwald-Lenum, M. (1992). A note on quantiles of the asymptotic distribution of the ML cointegration rank test statistics. *Oxford Bulletin of Economics and Statistics*, 54, 461–472.

Phillips, P. C. B. (1991). Optimal inference in cointegrated systems. *Econometrica*, 59, 283–306.

Phillips, P., & Perron, P. (1988). Testing for a unit root in time series regression. *Biometrika*, 75, 335–346.

Rappaport, A. (1986). *Creating shareholding values*. Free Press: New York.

Rushmore, S. (1992). Seven current hotel-valuation techniques. *Cornell Hotel and Restaurant Administration Quarterly* (August), 49–56.

Schwarz, G. (1978). Estimating the dimension of a model. *Annals of Statistics*, 6, 461–464.

Sheel, A., & Nagpal, A. (2000). The post-merger equity performance of acquiring firms in the hospitality industry. *Journal of Hospitality Financial Management*, 8, 37–45.

Waugh, B. (2003). Economic recovery in the wake of SARS. *Taiwan Review* (October), 26–31.