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Tourism stock performance and macro factors

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Abstract: Tourism has played a significant role in the global economy in terms of the production of goods and services, income and employment generation prior to the recent global recession. In 2007, the world's travel and tourism industry contributed (directly and indirectly) US$5,390 billion (or 10.4%) to global Gross Domestic Product, and the industry generated more than 231 million jobs or 8.3% of total world employment (World Travel & Tourism Council 2008). The real average annual growth of world tourism has exceeded the global economic growth during the period 2004-2007. In 2008-2009, the challenging economic environment and stock market volatility have a negative impact on tourism in wealth generation, job creation and economic diversification for many economies worldwide.

Tourism is arguably the largest industry in NZ. In 2007, the tourism industry contributed 9.1% (NZ$14.1 billion) to the country's gross domestic product and generated about 10% of full-time employment (Statistics New Zealand, 2008). The "100% Pure" branding has been a very successful marketing campaign, especially for adventure tourism. The global recession and swine flu have adversely affected international visitor arrivals to New Zealand. Furthermore, the Ministry of Tourism has revised down tourist arrival growth forecast from 4.0 percent per annum to 2.5 percent per annum for the next seven years.

The purpose of this paper is to examine the relationship between hospitality-tourism stock prices and macroeconomic factors in New Zealand using cointegration analysis and Vector Error Correction Model (VECM). The former establishes the long run realtionships between stock prices and macroeconomic factors and the latter identifies the short run dynamics between prices and macroeconomic varaibles. Interestingly, the specification of VECM in this context is also closely related to empirical models implied by the Asset Pricing Theory (APT). Therefore, the results from this paper also provide valuable insight into the pricing of firms where the main values come from the service that they provide rather than their physical assets. The results provided empirical evidence on the existence of relationships between the stock returns of tourism companies and macro-economic variables. This should provide invaluable insight for governmental policy makers when designing monetary and fiscal policies as well as executives from these individual firms to forecast the stock returns of their companies.

Keywords: *Tourism stocks, Co-integration, Arbitrage pricing theory*

1. INTRODUCTION

Tourism has played a significant role in the global economy in terms of the production of goods and services, income and employment generation prior to the recent global recession. In 2007, the world's travel and tourism industry contributed (directly and indirectly) US$5,390 billion (or 10.4%) to global Gross Domestic Product, and the industry generated more than 231 million jobs or 8.3% of total world employment (World Travel & Tourism Council 2008). The real average annual growth of world tourism has exceeded the global economic growth during the period 2004-2007. In 2008-2009, the challenging economic environment and stock market volatility have a negative impact on tourism in wealth generation, job creation and economic diversification for many economies worldwide.

Tourism is arguably the largest industry in NZ. In 2007, the tourism industry contributed 9.1% (NZ$14.1 billion) to the country's gross domestic product and generated about 10% of full-time employment (Statistics New Zealand, 2008). The "100% Pure" branding has been a very successful marketing campaign, especially for adventure tourism. The global recession and swine flu have adversely affected international visitor arrivals to New Zealand. Furthermore, the Ministry of Tourism has revised down tourist arrival growth forecast from 4.0 percent per annum to 2.5 percent per annum for the next seven years.

The tourism industry spans across a variety of businesses, which are associated with transportation, hospitality (restaurant/foodservice, accommodation, entertainment), tourism intermediaries (travel agencies, tourism operators/wholesalers) and so on. Most of these companies in the $20 billion tourism sector experienced declining business performance in the recent global recession. Plunging profits have forced tourism companies to embark on cost-cutting measures, large room rate discounting by the hotel industry and airlines to reduce capacity in response to the downturn in passenger numbers especially on long haul routes. Lower fuel costs and airfares have not stimulated global travel demand due to unfavourable economic conditions. Asset sales and business restructuring to concentrate on core activities for debt consolidation are also evident among tourism firms in the challenging operating environment. While fewer people are eating out in restaurants, it seemed that queues at fast food chains are growing. Apparently, e-tourism business (such as online travel agent and accommodation booking) has also experienced growth in the global economic downturn.

The credit crunch has caused tourism companies to turn to their shareholders for capital/equity raisings to meet their debt obligations through a mix of institutional placements, and rights issues, share purchase plans, top-up offers, company dividend reinvestment plans for other shareholders. The new capital is intended to lower the company's net debt-to-operating earnings ratio. Alternatively, some companies have turned to debt financing by selling bonds for project fundings. For instance, Auckland International Airport, New Zealand's busiest gateway, sold $25 m of bonds for additional funding in 2010. In November 2008, the company took up debt financing by selling $130 m bonds to fund their expansion plans.

The purpose of this paper is to examine the relationship between hospitality-tourism stock prices and macroeconomic factors in New Zealand using cointegration analysis and Vector Error Correction Model (VECM). The former establishes the long run realtionships between stock prices and macroeconomic factors and the latter identifies the short run dynamics between prices and macroeconomic varaibles. Interestingly, the specification of VECM in this context is also closely related to empirical models implied by the Asset Pricing Theory (APT). Therefore, the results from this paper also provide valuable insight into the pricing of firms in which the main values come from the service that they provide rather than their physical assets.

The plan of the remainder of the paper is as follows. Section 2 describes the risk-return performance of various publicly listed hospitality and tourism companies in the leisure & tourism sector for the period 1998 to 2009. The data and methodology used in the study are discussed in Section 3 with a concise discussion on the relationship between VECM and APT. The results are presented in Section 4 with some concluding remarks in Section 5.

2. HOSPITALITY AND TOURISM COMPANIES

The NZX All Stock index is a market value-weighted portfolio of all existing securities. The sample firms in the study include the following publicly-listed hospitality and tourism companies: Air New Zealand, Millennium & Copthorne, New Zealand Experience, Restaurant Brands, SkyCity Entertainment and Tourism Holdings Limited. They are classified under the Leisure and Tourism sector of the New Zealand Exchange.

Since the NZX50 Index was only introduced in 2002, we would use the NZX All Stock and NZX Leisure & Tourism indices to benchmark the performance of the six selected hospitality and tourism companies for the period 1998 to 2009. Summary statistics for their rates of return are given in Table 1.

Stock Return	Mean	Standard Deviation	Jarque-Bera
NZX All	-0.0003	0.043	59.62
Air New Zealand (AIR)	-0.0152 (7)	0.132 (2)	780.35
Millenium & Copthorne Hotels (MCK)	0.0016 (4)	0.088 (5)	7.22*
New Zealand Experience (NZE)	0.0046 (3)	0.146 (1)	6.89*
Restaurant Brands (RBD)	0.0005 (5)	0.094 (4)	77.04
Sky City Entertainment (SKC)	0.0070 (2)	0.073 (6)	7.84*
Tourism Holdings (THL)	-0.0014 (6)	0.112 (3)	36.84

Note: * indicates 1% significance level.

Table 1: Descriptive statistics of Monthly Returns of Hospitality and Tourism Stocks, 1998(1)-2009(12)

The means are monthly logarithmic rates of return. During this period, all the stock returns were less than 1%, with negative returns for AIR and THL. The standard deviation column shows that NZE and AIA had the highest and the lowest risk, respectively. The risk of returns of all the stocks is higher than the average stock for all companies in New Zealand of 4.3 percent. The positive relationship between return and risk is not obvious in any stocks. On the contrary, RBD stock displays relatively high return and low risk while the opposite is true for AIR. According to the Jarque-Bera test, the null hypothesis of returns following normal distribution is rejected for all stocks at the 5% significance level. However, it is not rejected for MCK, NZE and SKC at the 1% significance level. The stock betas are significant at the 5% level except for NZE.

Simple correlation analysis revealed that 72 percent of the variation in leisure & tourism index was explained by variations in the NZX All Stock index. During this period, the correlation coefficients of the individual stock return in the leisure and tourism sector range from 0.14 to 0.96. It appeared that 32 to 48 percent of the variation in the hospitality stock returns (MCK & RBD) and 62 percent of the same in the entertainment stock return (SKC) were associated with variations in the market. The tourism firms displayed a larger range for the correlation coefficients of the individual stock return with a maximum and minimum value of 63 percent and 5.8 percent, respectively.

3. METHODOLOGY AND DATA

The aim of this paper is to model the relationships between Hospitality and Tourism Stocks and Macro-economic varaibles. This section provides a brief overview on co-integration and the Vector Error Correction Model (VECM) used in the analysis. It also outlines the connection between VECM and the empirical models implied by the Asset Pricing Theory (APT).

Let $y_t = (y_{1t},...,y_{kt})'$ be a $k \times 1$ vector of $I(1)$ varaibles. Following the seminal work of Engle and Granger (1987), if there exists a vector β such that $\beta' y_t \sim I(0)$ then y_t is said to be cointegrated of order 1, $CI(1)$, with β being the cointegrating vector.

Consider the following Vector Autoregressive Process of order p with exogeneous variables ($VARX(p)$),

$$y_t = \sum_{i=1}^{p} \Pi_i^* y_{t-i} + \Lambda X_t + \varepsilon_t, \quad (1)$$

where X_t is a $l \times 1$ vector of $I(0)$ exogenous variables, Λ is a $k \times l$ matrix of coefficients and ε_t is a $k \times 1$ independently, identically distributed random vector. If y_t are cointegrated, then equation (1) can be rewritten as

$$\Delta y_t = \alpha\beta' y_{t-1} + \sum_{i=2}^{p-1} \Pi_i \Delta y_{t-i} + \Lambda X_t + \varepsilon_t \quad (2)$$

where $\Pi_{p-1} = -\Pi_p^*, \Pi_i = -\sum_{j=0}^{p-i} \Pi_{p-j}^*$ and $\alpha\beta'$ is a decomposition of $-\left(I - \sum_{i=1}^{p} \Pi_i^*\right)$ so that α and β are $k \times r$ matricies with $r < k$. Equation (2) has the empirical verion of the APT model proposed by Ross (1976) as a special case. Let $y_{it} = \log(p_{it})$ where p_{it} denotes the stock price of asset i at time t and $X_t = (m_t, F_{2t}, ..., F_{lt})'$ such that m_t denotes the return of the market portfolio and F_{jt} is an exogenous factor for all j. Then the basic empirical model of Ross (1976) can be derived by imposing the restriction that $\Pi_i = 0$ for all i. In this case, the return of the i^{th} asset is

$$r_{it} = \sum_{j=1}^{r} \alpha_{ij} u_{jt-1} + \lambda_{i1} m_t + \sum_{j=2}^{l-1} \lambda_{ij} F_{jt} + \varepsilon_{it} \tag{3}$$

where $r_{it} = \Delta y_{it}$ and $u_t = \beta' y_t$. Under the market equilibrium condition (or market efficient hypothesis), $u_{jt} = 0$ for all t and j. Therefore

$$r_{it} = \lambda_{i1} m_t + \sum_{j=2}^{l-1} \lambda_{ij} F_{jt} + \varepsilon_{it} \tag{4}$$

which is an empirical version of the model proposed by Ross (1976). Notice that the error correction term has the interpretation of deviation from market equilibrium which can also be interpreted as excess returns. Moreover, testing for cointegrating vector can also be interpretated as a test of market efficiency for the long run. This paper follows the approach of Johansen (1988) to determine the number of cointegration vector, r. Subsequent estimation of the parameters in the model follows the conventional approach, see for example, Lutkepohl (2005).

Let F_{jt} denotes a set of macro-economic factors, then the relationship between asset returns and macro-economic variables can be examined by testing

$$H_0 : \lambda_{ij} = 0$$

$$H_1 : \lambda_{ij} \neq 0.$$

Unlike the traditional setup, VECM also allows the possibility that some of the exogenous varaibles are $I(1)$. This can be achieved by defining $y_t = (\log p_{1t}, ..., \log p_{mt}, F_{2t}, ..., F_{lt})'$ with $\lambda_{ij} = 0$ for all i and j. The VECM also allows the possibility of spillover effects between asset returns. This can be achieved by relaxing the assumption that $\Pi_i = 0$.

We hypothesize that hospitality-tourism stock returns in New Zealand are influenced by market return, money supply, exchange rates, discount rate and tourist arrivals. These factors are similar to those used in past APT studies except for tourist arrivals. As investors tend to hold diversified portfolios to reduce their investment risk, we expect movements in the hospitality and tourism stocks to be affected by market return. The NZX All Stock index is a proxy for the market portfolio. Given the importance of tourism exports to the New Zealand economy, it is appropriate to include the tourist arrival variable in the model specification. Stock returns are affected by monetary policy which is the deliberate attempt by the Reserve/Central Bank to influence money supply and the level of interest in the economy. Expansionary (contractionary) monetary policy or increases (decreases) in the amount of money in circulation would stimulate (deflate) the economy and higher (lower) higher stock prices due to lower (higher) interest rates or costs of borrowing. The relationship between money supply and stock returns have been discussed extensively by Fama (1981) and Jensen et al. (1996). We used M1 as a proxy for money supply. Money supply M1 includes notes and coin held by the public plus chequeable deposits, minus inter-institutional chequeable deposits, and minus central government deposits. Stock returns are also influenced by the discount rate which affects investors' perception of risk. We used the 90-day bank bill rate as a proxy for the discount rate.

Monthly time series data for the period 1998(1)-2009(12) will be used in the study to examine hospitality and tourism stock prices for New Zealand. Specifically, this paper focuses on the stock prices of Air New Zealand (AIR), Millenium & Copthorne Hotels (MCK), New Zealand Experience (NZE), Restaurant Brands (RBD), Sky City Entertainment (SKC), Tourism Holdings (THL) and their relationships with money supply

(M1), tourist arrival (TA), exchange rate (NZAUD) and the 90-day bank bill rate (X90). Therefore, following the notation from equation (2), this study specifies that

$$y_t = \left(air_t, nze_t, mck_t, thl_t, rbd_t, skc_t, M1_t, TA_t, NZAUD_t, X90_t\right)' \tag{5}$$

with $\Pi_i \neq 0$. Seasonally unadjusted monthly stock price and macroeconomic data were obtained from Datastream, and tourist arrival data from Statistic NZ. Seasonal dummies are also included in the analysis given the seasonal nature of the data. That is,

$$F_t = \left(D_{1t}, ..., D_{11t}\right)' \tag{6}$$

such that

$$D_{jt} = \begin{cases} 1, & t = j^{th} \text{ month} \\ 0, & \text{otherwise} \end{cases}$$

R 2.11.1 with the cointegration analysis package, urca, is used for the cointegration analysis.

4. EMPIRICAL RESULTS

ADF and Phillips-Perron tests confirmed that all 10 variables are $I(1)$. Both Maximum Eigenvalue test and Trace test of Johansen (1988) indicated that there are 4 potential cointegrating vectors among the 10 variables. This suggested that there is evidence for long run relationships between stock prices of tourism companies and macro-economic variables. The Schwarz-Bayesian Information Criteria indicated that $p = 6$. Figure 1 contains the plots of all four error-correction terms based on the cointegrating vectors from the eigenvalue test. Interestingly, the first and third error correction terms exhibited cyclical components. This suggested that, while seasonality is common in tourism industry, seasonality is not synchronized between different firms within the industry. That is, seasonality is different in different firms. Moreover, three error correction terms have sample mean statistically different from 0, indicating the presence of excess returns over the sample period.

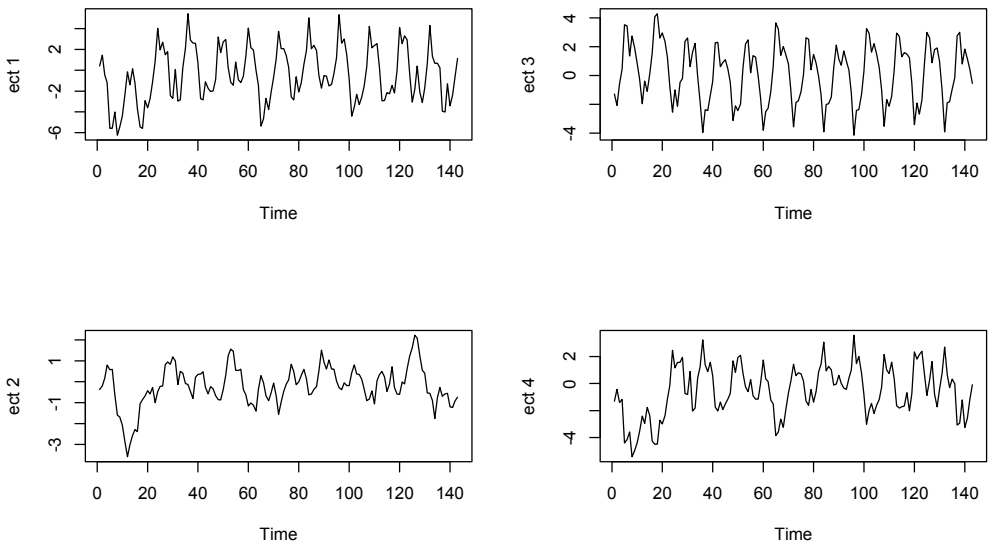

Figure 1. Error Correction Terms

In addition to the long run relationships, the estimation results for the VECM as specified in equation (2) also provided empirical evidence on the link between stock returns and macro-economic variable in the short run.

As shown in Table 2, the stock returns for the six companies were all influenced by the growth rate of money supply (M1). Interestingly, tourism arrival was significant for NZE, MCK and THL but not for AIR, RBD and SKC. This may be due to the fact that the performances of AIR, RBD and SKC do not depend on the tourism (foreign) market alone and the domestic market also played a crucial role in their stock performances. Exchange rate was also found to be significant for NZE, THL and SKC but not for AIR, MCK

and RBD. The results reflected the price stickiness nature of the service. The more flexible is the price the less likely to be affected by the variable in the exchange rate.

	M1	TA	NZAUD	X90
AIR	Yes			
NZE	Yes	Yes	Yes	
MCK	Yes	Yes		
THL	Yes	Yes	Yes	Yes
RBD	Yes			Yes
SKC	Yes		Yes	

Table 2. Statistically Significant Relationships between Stock Returns and Macro-economic Variables

5. CONCLUSION

In addition to analyzing changes in aggregate stock index for the leisure & tourism sector in New Zealand, this paper examined the risk and return performance of several individual hospitality and tourism companies in this sector. Detailed analysis of the various firm's risk/return characteristics are provided using mean, standard deviation and correlation coefficient. These descriptive statistics provide some useful insights into the diverse financial performance of NZ hospitality and tourism companies.

The long run relationships and the short run dynamics between stock returns and macro-economic variables have been analysed via cointegration analysis and VECM. The results demonstrated the empirical evidence of significant relationships between the stock returns of tourism companies and macro-economic variables. This should provide invaluable insight for governmental policy makers in New Zealand when designing monetary and fiscal policies as well as executives from these individual firms to forecast the stock returns of their companies.

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