

Effects of shifts in monetary policy on hospitality stock performance

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This study investigates the effects of changes in monetary policy on the stock performance of hospitality firms (airlines, hotels, restaurants and tourism firms) in Hong Kong. Changes in the monetary policy environment are measured by changes in the discount rate. Among the four hospitality sectors, hotel and tourism stocks exhibit a higher mean return and reward-to-risk ratio during expansive monetary periods. Regression test results also support the contention that different monetary policy circumstances have significant influences on the hotel and tourism stock performance. Lastly, a market timing investment strategy is proposed for hospitality stock investors to allocate their portfolios between hospitality stocks and risk-free assets according to movements in monetary policy environments. Following this market timing investment strategy, hospitality stock investors can significantly improve investment performance by achieving higher returns and lower risk.

Keywords: hospitality stocks; monetary policy; Hong Kong; discount rate; market timing

Introduction

It is widely believed that monetary policy has a significant influence on security returns. The central bank conducts monetary policy by regulating interest rates, which in turn impact on a firm's cost of capital and the national economy. Thus, changes in monetary policy, on the one hand, signal the future movement of the economy by providing useful information about potential economic conditions and corporate earnings. On the other hand, the intrinsic value of assets, based on the fundamental asset valuation model, equals the sum of present value of all future cash flows discounted by the required rate of return. Changes in monetary policy consequently affect the valuation of financial assets through changes in the expected level of future corporate earnings and/or the discount rate employed in valuing these expected cash flows.

Empirical studies have supported the relationship between monetary policy and security returns in the developed stock markets (Conover, Jensen, & Johnson, 1999; Jensen & Johnson, 1995; Mann, Atra, & Downen, 2004) and in the emerging stock markets (Chen, Chen, & Kuo, 2007a, 2007b). There is a similar association in various debt markets (Baker & Meyer, 1980; Cook & Hahn, 1988; Johnson, Buetow, Jensen, & Reilly, 2003), in the foreign exchange market (Brown, 1981; Neal, Roley, & Sellon, 1998), and in the mutual fund market (Chen, Chen, Liao, & Lin, 2008; Johnson, Buetow, & Jensen, 1999).

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Several recent hospitality research papers have investigated the connection between monetary policy factors and stock returns (Barrows & Naka, 1994; Chen, 2007c; Chen, Kim, & Kim, 2005). Barrows and Naka (1994) showed that the macroeconomic variable, growth rate of the money supply, was one of the significant explanatory factors of lodging stock returns in the USA. Similarly, Chen et al. (2005) found a positive link between money supply growth rate and hotel stock returns in Taiwan, and Chen (2007c) illustrated that a time lag change in the discount rate could significantly affect Chinese hotel stock returns.

Unlike Chen et al. (2005) who explored the relationship between economic variables and hospitality stock returns in Taiwan, Chen (2007a) examined the Taiwanese hotel stock performance under two different monetary policy conditions. As he noted, the money supply has not been commonly used as a measure of monetary policy stringency because of its frequent changes. Instead, he used changes in the discount rate to measure changes in monetary policy regime. An expansive (restrictive) monetary environment is a period with a decrease (rise) in the discount rate. He found that hotel stocks in Taiwan exhibited a higher mean return and reward-to-risk ratio under an expansive monetary environment. To examine whether the significant impact of various monetary conditions on hospitality stock returns is a general finding rather than unique to Taiwan, this study investigates the hospitality stock performance across different monetary policy periods in Hong Kong.

The Hong Kong stock market was founded in 1891 and consists of the Main Board and the Growth Enterprise Market (GEM). There were 975 companies listed on the Main Board and 198 companies listed on the GEM at the end of 2006. According to the World Federation of Exchanges (2006), the Hong Kong stock market ranked third in terms of total equity funds raised and in terms of size (market capitalisation). The Hong Kong stock market also ranked sixth among members of the World Federation of Exchanges and was ranked second in Asia, after the Japanese stock market. With strong economic growth in mainland China and the high internationalisation of the Hong Kong stock market, large amounts of foreign capital flow into this stock market. The Hong Kong stock market has become an important international financial channel.

The Hong Kong Tourism Board (2002) reported that Hong Kong's strategic location as the natural gateway to both Asia and China offers enormous advantages, such as being the international gateway to mainland China and the first-choice destination for travellers from China. Lew and McKercher (2002) pointed out that US and Australian residents frequently used Hong Kong as a trip gateway, especially to China, and the residents of China also used Hong Kong as a trip egress destination. According to the annual report of the Hong Kong Tourism Board (2004), about 21.81 million tourists visited Hong Kong in 2003, about 56% of whom came from China. The relaxation in travel restrictions in 2002 and a huge demand for outbound travel in Mainland China continues to provide extraordinary opportunities for Hong Kong's tourism industry (Hong Kong Tourism Board, 2003).

The World Tourism Organisation (2006) also reported that the total number of international tourist arrivals to Hong Kong reached 14.8 million, and tourism receipts were 10.2 billion US dollars in 2005, which ranked number three and four, respectively, in Asia. These positive trends can create boundless opportunities for the hospitality industry in Hong Kong. In consequence, the hospitality stocks in Hong Kong offer a good case study and the results can shed light on the critical impact of different monetary policy regimes on hospitality stock performance. Moreover, this study offers hospitality stock investors an explicit and practical stock market timing investment strategy to allocate

their portfolios in response to shifts in the monetary policy environments. Hospitality stock investors can significantly improve investment performance based on this market timing investment strategy.

The remainder of this paper is structured as follows. The hospitality stock data and monetary policy variables are described in the second section. The third section constructs two risk-adjusted performance measures on hospitality stock returns. The fourth section shows the regression analysis and empirical results. Implications for market timing based on the findings in this study are illustrated in the fifth section. The final section presents the conclusions and opportunities for future research.

Hospitality stock data and monetary policy measures

The hospitality companies covered in this study needed to have complete data on share price over the 14-year period from August 1992 to August 2006. Based on this selection criterion, we selected 10 hospitality-related firms in four sectors (one airline, six hotels, two restaurants and one tourism firm). All 10 companies were traded on the Main Board.

Table 1 lists the sample firm data in the four hospitality sectors. The monthly stock prices from August 1992 to August 2006 (169 monthly observations) are taken from the Datastream database. We then computed the value-weighted stock price index (SI) and stock returns (SR) for each sector:

$$SR_t = \ln\left(\frac{SI_t}{SI_{t-1}}\right) \times 100, \quad (1)$$

where SI_t and SI_{t-1} are stock prices at the end of the months t and $t-1$, respectively. Table 2 provides the descriptive statistics of the monthly returns of each hospitality sector as well as the monthly market returns (i.e. the Hang Seng Index returns). The

Table 1. List of four sectors of sample hospitality firms.

Company	Sector	Price per share	Shares outstanding (in thousands)	Market capitalisation (in millions)
Far East Consort International Hotel	Hotel	0.30	488,842	146
Hong Kong and Shanghai Hotel	Hotel	9.42	1,417,604	13,353
Miramar International Hotel	Hotel	10.40	577,231	6003
Regal Hotel	Hotel	0.62	8,459,194	5244
Associated International Hotel	Hotel	7.00	360,000	2520
Asia Standard International Group Limited	Hotel	0.10	9,462,161	946
Cathay Pacific Airways	Airlines	14.52	3,382,305	49,111
Fairwood	Restaurant	7.41	124,466	922
Café De Coral Group	Restaurant	11.86	544,410	6456
China Travel International Investment Hong Kong Limited	Tourism	1.90	5,695,354	10,821

Note: Market capitalisation is denominated in Hong Kong dollar. All numbers are figures as at the end of August 2006.

Table 2. Summary statistics of stock returns.

Sector	Mean	Maximum	Minimum	Standard deviation	Reward ratio
Hotel	0.12	39.93	-49.70	10.24	0.01
Airlines	0.20	33.57	-28.61	10.00	0.02
Restaurant	-0.36	52.70	-56.44	13.30	-0.03
Tourism	0.62	52.69	-59.60	15.17	0.04
Hang Seng Index	0.64	26.45	-34.82	7.87	0.08

four hospitality sectors had lower returns, higher standard deviations and reward-to-risk ratios than did the Hang Seng Index.

As mentioned, we use changes in discount rate to measure changes in the monetary policy. The discount rate is the interest rate that the central bank charges banks when the central bank provides reserves to the banking system by making discount loans to banks. The central bank can conduct monetary policies by regulating discount rates. If the central bank intends to pursue a restrictive monetary policy, it would raise the discount rate. An increase in discount rate can weaken a company's stock performance for the following two reasons. First, firms need to pay more for discount loans and thus lower corporate earnings. Second, a rise in the discount rate makes a firm's corporate cash flows worthless based on the stock valuation model.

The Hong Kong Monetary Authority (HKMA) discount rate data from August 1992 to August 2006 were taken from the *Taiwan Economic Journal (TEJ)* database. Table 3 presents the summary information on the discount rate change series. As shown in Table 3, the HKMA changed the discount rate 45 times, raising it 27 times and lowering it 18 times, during the full sample period. To measure different monetary policy months, we compute the rate change series. Accordingly, we categorise the entire sample period (169 months) as either restrictive or expansive months. An expansive monetary condition is characterised by the period with a decrease in the discount rate, whereas a restrictive monetary environment is associated with the period with an increase in the discount rate.

In addition, the months remain under the same monetary policy environment until a month in which a discount rate change in the opposite direction is detected. The months with the first rate changes in a series are omitted from the sample because the months that mark the initiation of a new monetary condition cover both expansive and restrictive

Table 3. Discount rate changes series: August 1992–August 2006.

Series	Increasing or decreasing	First rate change in series	Rate changes in series	Monthly observations in series
1	Decreasing	8/1992	1	20
2	Increasing	5/1994	3	20
3	Decreasing	2/1996	1	12
4	Increasing	3/1997	2	17
5	Decreasing	9/1998	3	9
6	Increasing	7/1999	6	17
7	Decreasing	1/2001	13	41
8	Increasing	7/2004	16	25

Note: A series is identified when a sequence of consecutive rate changes is in the same direction. Seven months in which the direction of a rate change is reversed are dropped.

days. As a result, 8 months are removed from the full sample observations and 161 months remain; 82 months follow discount rate decreases and 79 months follow discount rate increases.

Hospitality stock performance under various monetary policy environments

Table 4 shows the mean returns and the standard deviations of monthly stock returns under two different monetary periods. The data indicate that all stocks have greater mean returns during expansive monetary periods than during restrictive periods. Among them, the difference in the mean return over two different monetary conditions is 3.12% for hotel stocks and 4.12% for tourism stocks, which are statistically significant differences in their means at the 5% and 10% levels, respectively. These findings illustrate that hotel and tourism stocks performed significantly better under an expansive monetary environment.

The standard deviations of market and hospitality stock returns (except for the returns of airline stocks) are higher in the restrictive monetary period than in the expansive period. In other words, hotel, restaurant and tourism stock returns are more volatile under a restrictive monetary condition. The difference in standard deviations of hotel, restaurant and tourism stock returns between the two monetary environments is statistically significant.

Additionally, two indexes are used to evaluate the risk-adjusted performance of the portfolio: the Sharpe (1964) index and the Treynor (1965) index. Table 5 reports the Sharpe ratio (reward-to-total risk ratio) for hospitality and market returns over the full sample and both expansive and restrictive periods. The Sharpe ratio is given as:

$$\text{Sharpe index} = \left(\frac{\overline{SR}_i - \overline{R}_f}{\sigma_i} \right), \tag{2}$$

Table 4. Mean returns and standard deviations of monthly stock returns.

Mean return	Expansive period	Restrictive period	Difference in means	<i>t</i> -Statistics (<i>p</i> -value) for difference in means
Hotel	1.62	-1.50	3.12	1.92 (0.05)**
Airlines	0.74	-0.21	0.95	0.61 (0.54)
Restaurant	0.67	-1.87	2.54	1.20 (0.23)
Tourism	2.46	-1.66	4.12	1.70 (0.09)*
Hang Seng Index	1.06	0.15	0.91	0.72 (0.47)

Standard deviation	Expansive period	Restrictive period	Difference in standard deviations	<i>F</i> -statistics (<i>p</i> -value) for difference in standard deviations
Hotel	8.18	12.16	3.98	2.21 (0.00)***
Airlines	10.06	9.73	-0.33	1.07 (0.76)
Restaurant	12.16	14.75	2.59	1.47 (0.09)*
Tourism	12.43	17.57	5.14	2.00 (0.00)***
Hang Seng Index	7.75	8.21	0.46	0.06 (0.60)

Note: The data exclude months of reverse changes in the monetary policy.

*Significant at the 10% level.

**Significant at the 5% level.

***Significant at the 1% level.

Table 5. Sharpe and Treynor ratios of stock returns.

	Full sample	Expansive periods	Restrictive periods	Difference in Sharpe ratios
Sharpe ratio				
Hotel	-2.05	15.78	-15.02	30.80
Airlines	0.86	4.13	-5.55	9.68
Restaurant	-8.20	2.84	-14.90	17.74
Tourism	1.94	17.15	-11.30	28.45
Hang Seng Index	4.72	9.42	-2.20	11.62
Treynor ratio				
Hotel	-2.90	20.11	-23.07	43.18
Airlines	0.15	5.26	-15.79	21.05
Restaurant	-17.20	12.55	-23.55	36.10
Tourism	3.15	28.41	-18.32	46.73
Hang Seng Index	4.43	8.76	-2.17	10.93

where \overline{SR}_i is the mean annualised return, \overline{R}_f the mean risk-free rate and σ_i the standard deviation of the annualised returns. Taken from the *TEJ* database, the monthly series of the 1-year time deposit rate is used as the risk-free rate R_f . The Sharpe index of hotel stock returns is -2.05 over the entire sample period, -15.02 during the restrictive period and 15.78 during the expansive period. The Sharpe indices of all the four hospitality sectors are positive under an expansive monetary environment and negative under a restrictive monetary environment.

The Treynor ratio for the full sample and two different monetary policy environments is also presented in Table 5. The Treynor index measures the reward-to-systematic risk ratio and is given as:

$$\text{Treynor index} = \left(\frac{\overline{SR}_i - \overline{R}_f}{\beta_i} \right), \quad (3)$$

where \overline{SR}_i is the mean annualised hotel stock return, \overline{R}_f the mean risk-free rate and the β the estimated using the capital asset pricing model (CAPM) in Equation (4):

$$SR_{i,t} - R_{f,t} = \alpha_i + \beta_i (R_{m,t} - R_{f,t}) + \varepsilon_{i,t}, \quad (4)$$

where SR_i is the annualised stock return for sector i , R_m is the annualised market return and ε_i is the residual term. Results in Table 5 also show that the Treynor indices of all the four hospitality stock returns are positive under the expansive monetary environment and negative under the restrictive monetary environment.

In conclusion, Sharpe and Treynor values of hotel stocks are positive only in the expansive monetary environment, implying that hotel stocks offer a better reward per unit of risk in expansive periods. Further, negative Sharpe and Treynor indices of hotel stock returns in restrictive periods imply that hospitality stock investors could have achieved better investment performance simply by holding risk-free assets instead of hotel stocks during restrictive monetary periods. Similar results are detected for the airlines, restaurants, tourism and market index.

Regression tests and test results

To examine the link between stock returns and changes in the monetary policy, we run the regression of stock returns on the monetary policy dummy variables according to the following equation:

$$SR_t = \alpha_0 + \alpha_1 DR_HK + \mu_t, \tag{5}$$

where SR_t is the monthly hospitality or market returns and DR_HK the dummy variable for changes in the discount rate in HK, which takes a value of one during restrictive monetary periods and zero during expansive monetary periods. The approach of Newey and West (1987) was used to attain consistent estimates by correcting for the possible presence of autocorrelation and heteroscedasticity in Equation (5).

The regression results are shown in Table 6. Over the full sample period from August 1992 to August 2006, the coefficient of the dummy variable of changes in the discount rate DR_HK is significantly negative for hotel and tourism stock returns, but is not statistically significant for airline, restaurant and market returns. These findings imply that changes in the HKMA discount rate have a significant impact on hotel and tourism stock returns, but not on airline, restaurant and market returns. The negative coefficient of the DR_HK dummy variable indicates that restrictive monetary conditions are significantly associated with lower hotel (tourism) stock returns, whereas hotel (tourism) stocks experience higher returns in expansive monetary periods.

To further control for the possible impact of other variables on the relationship between monetary policy dummy variable and stock returns, we added four macroeconomic factors and three non-macroeconomic events into Equation (5) and perform the following multiple regression equation:

$$SR_t = \lambda_0 + \lambda_1 \Delta MS_t + \lambda_2 \Delta UEP_t + \lambda_3 \Delta EX_t + \lambda_4 EINF_t + \lambda_5 DR_HK + \lambda_6 D911 + \lambda_7 D1997 + \lambda_8 DSARS + e_t, \tag{6}$$

where MS , $EINF$, UEP and EX denote growth rate of money supply, inflation rate, changes in unemployment rate and percentage changes in exchange rate. Three dummy variables

Table 6. Regression results of returns on dummy variable of changes in discount rate.

$SR_t = \alpha_0 + \alpha_1 DR_HK + \mu_t$					
Sector	Hotel	Airlines	Restaurants	Tourism	Hang Seng Index
Constant	1.62 (1.88)*	0.74 (0.71)	0.67 (0.43)	2.46 (1.74)	1.06 (1.16)
DR_HK	-3.12 (-2.21)**	-0.96 (-0.62)	-2.54 (-1.14)	-4.12 (-1.63)*	-0.91 (-0.72)
F -statistic	3.70	0.38	1.44	2.89	0.53
\bar{R}^2 [p -value]	[0.05]**	[0.54]	[0.23]	[0.10]*	[0.47]
	0.016	0.002	0.003	0.012	-0.003

Note: Figures in parentheses are Newey and West (1987) corrected t -statistics. The data exclude months of changes in the monetary policy. \bar{R}^2 is the adjusted R^2 .

*Significant at the 10% level.

**Significant at the 5% level.

D1997, D911 and DSARS represent three recent non-macroeconomic forces, the takeover of Hong Kong in June 1997, the terrorist attacks of September 11, 2001 in the USA and the severe acute respiratory syndrome (SARS) outbreak in March 2003, respectively. Three non-macroeconomic event dummy variables take the value of one during the corresponding month on the event date and zero otherwise.

As mentioned, stock prices equal the present value of all future cash flows discounted by the discount rate, i.e. stock prices reflect investors' expectations about future corporate earnings and dividends. Since the economic conditions usually influence the corporate earnings and dividends, it is often observed that stock prices tend to fluctuate with economic conditions (Chen, 2007b; Chen, Roll, & Ross, 1986). Chen et al. (1986) hence argued that macroeconomic factors could affect stock prices through the impact on future dividends and/or the discount rate. Among all economic variables, MS, EINF, UEP and EX are commonly used by empirical research studies to test their effects on stock prices in the USA (Chen et al., 1986; Shanken & Weinstein, 2006) and international stock markets (Asprem, 1989; Azeez & Yonezawa, 2006; Kaneko & Lee, 1995). Barrows and Naka (1994), Chen et al. (2005), Chen (2007a, 2007c) also employed those factors to examine the association between macroeconomic variables and hospitality stock returns.¹ Further, the potential impact of some mega-events related to the hospitality industry is taken into consideration as well. Particularly, Chen et al. (2005) found that hotel stock performance in Taiwan were strongly associated with political events, the terrorist attacks of September 11, 2001 in the USA and the SARS outbreak in 2003. Chen (2007c) reported that the takeover of Hong Kong in June 1997, the 9/11 terrorist attacks in the US and the SARS outbreak in 2003 exhibited a significant influence on the Chinese hotel stock returns.

Before running multiple regressions based on Equation (6), we showed correlations between DR_HK and other macroeconomic variables over the full sample period in Table 7. Among all variables, none highly correlates with any other, keeping away from the possible existence of multicollinearity. Empirical results in Table 8 further illustrate that the negative influence of the dummy variable DR_HK remains significant after macroeconomic factors and non-macroeconomic event dummy variables are added into the regressions. Moreover, all three non-macroeconomic variables had significant effects on market and four hospitality stock returns. Returns were most seriously hurt by the SARS outbreak, followed by the 9/11 terrorist attacks. The negative impact of the SARS outbreak on the four sectors is -14.99 , -14.64 , -12.21 and -26.87 , respectively, and higher than that of the Hang Seng Index. The takeover of Hong Kong had a positive impact on Hong Kong's hospitality stock returns. These findings are consistent with the results of Chen et al. (2005) and Chen (2007c).

Finally, empirical findings show that among airlines, hotels, restaurants and tourism firms, only hotel and tourism stock prices are significantly influenced by the changes in

Table 7. Correlations between monetary policy dummy variable and macroeconomic factors.

Variable	DR_HK	ΔEX	EINF	ΔMS	ΔUEP
DR_HK	1.00				
ΔEX	0.00	1.00			
EINF	0.06	-0.06	1.00		
ΔMS	0.02	-0.02	0.09	1.00	
ΔUEP	-0.02	0.05	-0.04	0.04	1.00

Table 8. Regression results of hospitality stock returns on macroeconomic and non-macroeconomic variables.

$SR_t = \lambda_0 + \lambda_1 \Delta MS_t + \lambda_2 \Delta UEP_t + \lambda_3 \Delta EX_t + \lambda_4 EINF_t + \lambda_5 DR_HK + \lambda_6 D911 + \lambda_7 D1997 + \lambda_8 DSARS + e_t$									
Variable	ΔMS	ΔUEP	ΔEX	EINF	DR_HK	D911	D1997	DSARS	\bar{R}^2
Hotel	0.16 (1.64)*	-0.82 (-0.24)	-5.39 (-0.73)	-1.01 (-1.34)	-3.63 (-2.43)**	-10.35 (-8.42)***	4.01 (2.79)***	-14.99 (-15.91)***	0.02
Airlines	0.03 (0.38)	0.48 (0.14)	-4.10 (-0.43)	-0.77 (-0.98)	-1.89 (-1.15)	-26.32 (-17.86)***	15.15 (2.45)**	-14.63 (-13.31)***	0.05
Restaurant	0.21 (1.44)	9.02 (1.54)	-16.13 (-2.00)**	-1.46 (-1.42)	-2.94 (-1.00)	11.96 (5.57)***	14.94 (2.04)**	-12.20 (-7.79)***	0.04
Tourism	-0.08 (-1.12)	-4.92 (-0.63)	-4.91 (-0.49)	-1.46 (-1.54)	-5.02 (-1.84)*	-26.89 (-10.08)***	6.88 (2.77)***	-26.86 (-16.11)***	0.03
Hang Seng Index	0.10 (1.20)	-2.04 (-0.67)	-11.26 (-1.37)	-0.54 (-0.89)	-1.51 (-1.18)	-11.45 (-10.00)***	8.32 (4.63)***	-6.50 (-7.14)***	0.02

Note: Figures in parentheses are Newey and West (1987) corrected t -statistics. The data exclude months of changes in the monetary policy. \bar{R}^2 is the adjusted R^2 .

*Significant at the 10% level.

**Significant at the 5% level.

***Significant at the 1% level.

the monetary policy. These results may be due to the following reasons. First, Nowak (1993) argues that monetary policy changes are likely to exhibit a strong effect on interest rate-sensitive industries. As Collier and Gregory (1995) noted, the hotel industry is capital-intensive, involving regular and large investment decisions. Second, Singh and Kwansa (1999) report that experts from the lodging and financial services industries assert that the monetary policy would be one of the key factors that have a profound influence on the lending criteria and terms by financial institutions for hotel mortgages. Consequently, changes in monetary policy can significantly affect hotel stock performance because the lending criteria and terms can considerably control the ability of hotel firms to access the capital. In addition, the China Travel International Investment Hong Kong Limited is a holding company of China Travel Service (holdings). The hotel business is also one of the core businesses of China Travel Service (holdings).² Therefore, stock prices of the China Travel International Investment Hong Kong Limited are also strongly related to shifts in monetary policy.

In comparison, the restaurant business is less capital-intensive and the performance of restaurants mainly relies on the choice of an appropriate location and a limited amount of capital to equip and furnish the facility (Skalpe, 2003). Moreover, Arndt and Zellner (2003) argue that the success of airline companies is largely due to its hedging fuel strategy and lower operating costs. Zea (2003) states that hedging is a common way to manage the financial risk of input price changes, and no airline input is more volatile than fuel. He further reports that the Cathay Pacific Airways was one of the major airlines that generated a big loss in operating profit due to the fuel price increase in 2000. This may be the reason that changes in discount rate have an impact on airline and restaurant stock prices, but the influence is not significant.

Implications for the market timing strategy

In an effort to achieve high rewards, stock investors employ a variety of investment strategies. One popular approach is market timing, the attempt to anticipate future market movements and then allocate the investment portfolios based on the prediction. In this study, hotel and tourism stocks have a higher mean return and lower standard deviation under the expansive monetary environment, implying that a restrictive monetary condition is significantly associated with lower hotel and tourism stock returns, whereas hotel and tourism stocks experience higher returns during an expansive monetary period.

Moreover, both the Sharpe and Treynor ratios of hotel and tourism stocks are positive during expansive monetary months, but negative during restrictive monetary months, meaning that the risk-free asset even outperforms the hotel and tourism stocks under the restrictive monetary policy period. These findings suggest that hospitality stock investors can allocate their portfolios between hospitality stocks and risk-free assets according to different movements in monetary policy environments.

Consequently, we suggest that hospitality stock investors invest in hotel or tourism stocks during the expansive monetary period, but invest in risk-free assets during the restrictive monetary period. In other words, hospitality stock investors hold hotel or tourism stocks during the months with a decrease in the discount rate and shift their investment holding to risk-free assets during the months experiencing an increase in the discount rate.

Table 9 summarises the investment results with and without using the market timing strategy based on changes in the monetary policy. As shown in Table 9, without considering the market timing strategy, the averages of annualised hotel, tourism and market

Table 9. Stock performance results with and without using the market timing strategy.

	Hotel	Tourism	Hang Seng Index
<i>No market timing</i>			
Mean annual return (%)	1.4065	7.4594	7.9734
Standard deviation (%)	123.0716	182.0748	94.6448
Reward ratio	0.0114	0.0410	0.0842
<i>Market timing (without consideration of transaction costs)</i>			
Mean annual return (%)	12.3114	16.7139	9.0578
Standard deviation (%)	67.4395	103.5931	64.4772
Reward ratio	0.1826	0.1613	0.1405
<i>Market timing (with consideration of transaction costs)</i>			
Mean annual return (%)	12.3106	16.7131	9.0570
Standard deviation (%)	67.4396	103.5932	64.4772
Reward ratio	0.1825	0.1613	0.1405

returns are 1.4065%, 7.4594% and 7.9734%, respectively. The corresponding standard deviations are 123.0716%, 182.0758% and 94.6448%. Thus, the reward ratios are 0.0114, 0.0410 and 0.0842, respectively. These results illustrate that the market index outperforms hotel and tourism stocks.

Table 9 reports stock performance results using the market timing strategy. The average annual returns of hotel, tourism and the Hang Seng Indexes are 12.3114%, 16.7139% and 9.0578% and the standard deviations are 67.4395%, 103.5931% and 64.4772%, respectively. As a result, the corresponding reward ratios are 0.1826, 0.1613 and 0.1405, implying that hotel and tourism stocks outperform the market index. It is also apparent that the hotel and tourism stock performance significantly improves in terms of higher mean returns, lower risk and higher reward ratios. Specifically, the mean return of hotel and tourism stocks increases by 10.9049% and 9.2545% and risk is reduced by approximately 56% and 78%, respectively.

In addition, even when trading costs are considered, all results are not significantly different from those reported in Table 9 and consequently do not alter the comparisons presented above. For example, if round trip transaction costs of 0.01% are applied,³ the mean annualised hotel, tourism and market returns are 12.3106%, 16.7131% and 9.0570%, respectively. The corresponding standard deviations are 67.4396%, 103.5932% and 64.4772%. The reward ratios are 0.1825, 0.1613 and 0.1405, respectively. These results actually reflect the fact that trading based on the proposed market timing strategy is relatively infrequent. As shown in Table 3, there are only eight trades over the 14-year sample period and hence transaction costs do not play a significant factor in implementing this investment strategy, especially considering that not even one transaction is made in 1 year on an average.

Conclusions and future research

This paper examines the hospitality stock performance under two different monetary policy regimes in Hong Kong. In general, stocks of three of the four sectors of hospitality firms (six hotels, two restaurants and one tourism company) exhibit a higher mean return and lower standard deviation under an expansive monetary policy environment. The one exception is the airline sector. Especially the differences in means and standard deviations of hotel and tourism stock returns during expansive and restrictive monetary policy periods are statistically significant.

Regression results indicate a significantly negative coefficient of the dummy variable of changes in the discount rate on hotel and tourism stock returns and therefore support that changes in monetary policy environments have a strong influence on hotel and tourism stock performance. The significant effects of changes in monetary policy on hotel and tourism stock returns remain robust even after four macroeconomic factors and three non-macroeconomic event dummy variables are added into regression test equations. The findings in this study are also consistent with empirical evidence documented for the emerging Taiwanese hotel stocks (Chen, 2007a).

Furthermore, the Sharpe and Treynor indexes of hospitality stocks are positive and relatively high during expansive monetary months, but negative during restrictive monetary months. This implies that the risk-free assets outperform the hospitality stocks under the restrictive monetary policy condition. We hence explicitly provide hospitality stock investors a simple and useful market timing investment strategy based on changes in the discount rate in Hong Kong. This strategy suggests investing in hotel and tourism stocks during expansive monetary policy months and holding risk-free assets during restrictive monetary months. Hospitality stock investors following this market timing investment strategy can significantly improve the investment performance by achieving higher returns and lower risk.

Lastly, Hong Kong has been a special administrative region of the People's Republic of China since 1997. After the Closer Economic Partnership Arrangement (CEPA) was endorsed by the government of the Hong Kong special administrative region and the Central People's Government of the People's Republic of China in 2003,⁴ the travel restrictions between China and Hong Kong have been relaxed and the economic activities between the two regions have increased. We anticipate that more travellers from China will visit Hong Kong and more foreigners will use Hong Kong as the gateway to China. Hong Kong's tourism firms stand to benefit from the expansion of tourism. However, owing to its close link with the US dollars exchange rate mechanism, the People's Bank of China (PBC) does not change the discount rate very often.⁵ Thus, we find that changes in the discount rate of PBC have no significant impact on hospitality stock returns in Hong Kong.⁶ Future studies can examine whether changes in the PBC monetary policy have a significant effect on hospitality stocks in Hong Kong when the PBC conducts a more independent monetary policy.

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Notes

1. Industrial production (IP) is another popular economic variable generally used in the empirical research papers. However, monthly data of IP are not available for the case of Hong Kong. Data of economic variables were also taken from the *TEJ* database.
2. See China Travel International Investment Hong Kong Limited website: http://www.metroparkhotels.com/group_aboutus2.php.
3. See Hong Kong Stock Exchange website: <http://www.hkex.com.hk/tradinfo/trancost/trancost.htm>.
4. CEPA is an economic agreement between the government of the Hong Kong special administrative region and the Central People's Government of the People's Republic of China, signed on June 29, 2003 (<http://www.taiwantrade.com.tw/tpt/cepa/cepa.htm>).

5. From August 1998 to August 2006, the PBC changed the discount rate only four times: two increases and two decreases.
6. Over the sample period, no significant *t*-statistics was identified between the PBC monetary policy dummy variable and any of the four hospitality stock returns.

References

- Arndt, M., & Zellner, W. (2003, April 14). How to fix the airlines: The troubled industry needs a model that works. *Business Week*, 3828, 74–78.
- Asprem, M. (1989). Stock prices, asset portfolios and macroeconomic variables in ten European countries. *Journal of Banking and Finance*, 13(4–5), 589–612.
- Azeez, A.A., & Yonezawa, Y. (2006). Macroeconomic factors and the empirical content of arbitrage pricing theory in the Japanese stock market. *Japan and the World Economy*, 18(4), 568–591.
- Baker, H.K., & Meyer, J.M. (1980). Impact of discount rate-changes on treasury bills. *Journal of Economics and Business*, 33(3), 43–48.
- 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(2), 119–128.
- Brown, K.H. (1981). Effects of changes in the discount rate on the foreign exchange value of the dollar: 1973–1978. *Quarterly Journal of Economics*, 95(4), 551–558.
- Chen, M.H. (2007a). Hotel stock performance and monetary conditions. *International Journal of Hospitality Management*, 26(3), 588–602.
- Chen, M.H. (2007b). Interactions between business conditions and financial performance of tourism firms: Evidence from China and Taiwan. *Tourism Management*, 28(1), 188–203.
- Chen, M.H. (2007c). Macro and non-macro explanatory factors of Chinese hotel stock returns. *International Journal of Hospitality Management*, 26(4), 991–1005.
- Chen, M.H., Chen, S.J., & Kuo, Y.C. (2007a). Asset returns and monetary policy in the emerging Taiwan financial markets. *Advances in Investment Analysis and Portfolio Management*, 3, 39–63.
- Chen, M.H., Chen, S.J., & Kuo, Y.C. (2007b). The critical role of monetary policy in the link between business conditions and security returns in Taiwan. *Asia Pacific Management Review*, 12(1), 1–12.
- Chen, M.H., Chen, S.J., Liao, C.N., & Lin, C.M. (2008). Taiwanese mutual fund performance under different central bank of China monetary policy environments. *Emerging Markets Finance and Trade*, 44(2), 109–125.
- Chen, M.H., Kim, W.G., & Kim, H.J. (2005). The impact of macroeconomic and non-macroeconomic forces on hotel stock returns. *International Journal of Hospitality Management*, 24(2), 243–258.
- Chen, N., Roll, R., & Ross, S.A. (1986). Economic forces and the stock market. *Journal of Business*, 59(3), 383–403.
- Collier, P., & Gregory, A. (1995). Investment appraisal in service industries: A field study analysis of the UK hotels sector. *Management Accounting Research*, 6(1), 33–57.
- Conover, C.M., Jensen, G.R., & Johnson, R.R. (1999). Monetary environments and international stock returns. *Journal of Banking and Finance*, 23(9), 1357–1381.
- Cook, T., & Hahn, T. (1988). The information content of discount rate announcement and their effect on market interest rates. *Journal of Money, Credit, and Banking*, 20(2), 167–180.
- Hong Kong Tourism Board (2002). *Annual report on tourism*. Hong Kong: Author.
- Hong Kong Tourism Board (2003). *Annual report on tourism*. Hong Kong: Author.
- Hong Kong Tourism Board (2004). *Annual report on tourism*. Hong Kong: Author.
- Jensen, G.R., & Johnson, R.R. (1995). Discount rate-changes and security returns in the US: 1962–1991. *Journal of Banking and Finance*, 19(1), 79–96.
- Johnson, R.R., Buetow, G.W., & Jensen, G.R. (1999). International mutual funds and Federal Reserve policy. *Financial Services Review*, 8(3), 199–210.
- Johnson, R.R., Buetow, G.W., Jensen, G.R., & Reilly, F.K. (2003). Monetary policy and fixed income returns. *Quarterly Review of Economics and Finance*, 43(1), 133–146.
- Kaneko, T., & Lee, B.S. (1995). Relative importance of economic factors in the US and Japanese stock markets. *Journal of the Japanese and International Economies*, 9(3), 290–307.
- Lew, A.A., & Mckercher, B. (2002). Trip destinations, gateways and itineraries: The example of Hong Kong. *Tourism Management*, 23(6), 609–621.

- Mann, T., Atra, R.J., & Downen, R. (2004). US monetary policy indicators and international stock returns: 1970–2001. *International Review of Financial Analysis*, 13(4), 543–558.
- Neal, C., Roley, V.V., & Sellon, G.H. (1998). Monetary policy actions, intervention and exchange rates: A reexamination of the empirical relationships using federal funds rate target data. *Journal of Business*, 71(2), 147–177.
- Newey, W., & West, K. (1987). A simple positive, semi-definite, heteroskedasticity and autocorrelation consistent covariance matrix. *Econometrica*, 55(3), 703–708.
- Nowak, L.S. (1993). *Monetary policy and investment opportunities*. Westport, CT: Quorum Books.
- Shanken, J., & Weinstein, M.I. (2006). Economic forces and the stock market revisited. *Journal of Empirical Finance*, 13(2), 129–144.
- Sharpe, W.F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *Journal of Finance*, 19(3), 425–442.
- Singh, A.J., & Kwansa, F.A. (1999). Financing the lodging industry in the next millennium. *International Journal of Hospitality Management*, 18(4), 415–425.
- Skalpe, O. (2003). Hotel and restaurants – are the risks rewarded? Evidence from Norway. *Tourism Management*, 24(6), 623–634.
- Treynor, J.L. (1965). How to rate management investment funds. *Harvard Business Review*, 44(1), 63–75.
- World Federation of Exchanges (2006). *Monthly statistics*. Retrieved December 2006, from <http://www.world-exchanges.org/publications/EQU1106.XLS>
- World Tourism Organisation. (2006). *Tourism highlights 2006 edition*. Retrieved December 12, 2006, from http://www.unwto.org/facts/eng/pdf/highlights/highlights_06_eng_hr.pdf
- Zea, M. (2003). Is airline industry risk unmanageable? *Mercer on Travel and Transport*, 21, 21–26.

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