"Monday effect and institutional holdings on tourism stocks: the Taiwan Security Exchange Evidence"

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Monday effect and institutional holdings on tourism stocks: the Taiwan Security Exchange evidence

Abstract

This paper attempts to investigate the Monday effect, in which the average Monday returns are significantly negative, upon Agent Cost Theory and Efficient Market Theory. The total number of usable observations includes data from 20 tourism firms, and the data frequency is weekly. The empirical results report that the "traditional" Monday effect does not occur for tourism stocks on the Taiwan Security Exchange and further indicate that positive returns on the last weekly trading day (especially when it is a Friday) is one of the factors to result in positive Monday returns. Moreover, regression analyses uncover a finding that institutional holdings and Monday returns are not significantly correlated, which is inconsistent with most of the literature. In addition, Monday exchange rate movements and Monday returns – the relationship of which has been neglected in the literature – are negatively correlated, suggesting that positive Monday returns coincide with the appreciation of the New Taiwan Dollar. Based on the above findings, this paper argues that institutional holdings tend to purchase stocks on Monday after positive Friday returns, which may be the reason for Monday appreciation.

Keywords: exchange rate, monday effect, institutional holding, tourism stock.
JEL Classification: F23, G15, G20.

Introduction

Taiwan's central government has been gradually paying more attention to the tourism industry, one of the two most attractive industries of the 21st century. The Taiwan Institute of Economic Research, 2007 Taiwan Tourism Satellite Account 1999-2006, reports that the economic contribution of Taiwan's tourism industry was 4.18%, 4.32%, 5.10%, 4.87%, 3.93%, 4.54%, 4.25% and 4.44% of Gross Domestic Product (GDP) from 1999 to 2006, respectively. The share of employment was 5.47%, 5.99%, 5.36%, 5.11%, 5.07%, 5.15%, 4.35% and 5.07% of total employment in the corresponding year. The Ministry of Transportation and Communication, ROC, estimates that the proportion of tourism GDP increased to 8% of overall domestic GDP in 2008. Therefore, it is clear that the tourism industry will play a major role in Taiwanese economic development during this century.

The two-day weekend policy and the two-weekend-off-a-month policy had been implemented several years prior to 2001 in Taiwan. These policies had decreased the number of transaction days per week and every other week, respectively. The highlighted question that arose after these policies were implemented was whether the reduction in transaction days changed investment behavior. As a result, this is an important issue that is worth further exploration. Previous studies, such as those by Cross (1973), French (1980) and Jaffe & Westerfild (1985), have documented that negative Monday returns (called the Monday effect) existed not only in US stock markets but also in some foreign markets beyond the US. However, most of their papers explore this anomaly using the stock index or future index as a research sample, whereas adoption of a certain sector for research has been limited. Therefore, this paper uses tourism stocks (including those in the tourism, trading & consumers goods and airline sectors) as a research sample. Moreover, the literature focused on the Monday effect has not investigated the relationship between the Monday effect and Monday exchange rate movements; hence, this deficiency is another motivation for this paper. In addition, according to Agent Cost Theory, institutional holdings exhibit a positive relationship with stock returns, whereas some literature (Brooks & Kim, 1997; Wang, Li & Erickson, 1997; Brusa, Liu & Schulman, 2003; Chen and Hong, 2006) indicates that the weekday effect exists in stock markets because government or firms tend to announce bad news on the last weekly trading day after the market is closed. Therefore, the relationship of institutional holdings and Monday returns has evolved into an interesting issue.

In finance literature, the puzzling discovery of negative Monday returns has attracted a myriad of different and incompatible explanations. As mentioned in the above paragraph, the Monday effect exists in US, European and Asian markets, suggesting that this anomaly is a universal phenomenon. However, Chang, Pinegar & Ravichandran (1993), Dubois & Louvet (1996) and Yu, Chiou & Jordan-Wagner (2008) report that the Monday effect has gradually disappeared from the US stock market, despite the fact that it remains in foreign markets. Moreover, Brusa, Liu & Schulman (2003) document that the "reserve" Monday effect has existed in US markets since 1990, whereas in foreign markets, the "traditional" Monday effect persists. Due to the different findings in different countries and in different peri-

ods, whether the Monday effect exists for tourism stocks on the Taiwan Security Exchange (TSE) is of interest.

This paper reports that the Monday effect does not exist for tourism stocks on the TSE. Second, institutional holdings and Monday returns are negatively correlated. Third, Monday exchange rate movements and Monday returns move in the same direction. Furthermore, contrary to most of the literature, this paper focuses on an emerging market.

The paper is organized as follows. Section 1 provides a literature review and discussion. Section 2 first details the data source, collection and selection, followed by an illustration of the variable definitions and, finally, establishment of hypotheses and models. Section 3 presents and discusses the empirical findings with respect to the hypotheses made in Section 1. The final Section offers research conclusions.

1. Literature review and hypotheses

This paper begins with a literature review on the individual investors and the Monday effect. Miller (1988) concludes that individual investors usually process and analyze information and make investment strategies on weekends. He also finds that individual investors tend to increase trading activity (especially, sell transactions) when the market opens on Mondays, although the information that the individuals receive on weekends from the brokerage is biased towards buy recommendations (Groth, Lewellen, Schlarbaum & Lease, 1979; Diefenbach, 1972; Dimson & Paulo, 1986). In addition, Lakonishok & Maberly (1990) document that Monday is the day with the least trading volume relative to the other four weekdays. Second, transactions of individuals are the highest on Mondays relative to other transaction days; for institutions, they are the lowest. Third, individuals have a higher tendency to sell than to buy. Furthermore, Osborne (1962) reports that institutional investors are not eager to make transactions on Mondays because Monday tends to be the day for strategic planning. Because individual investors have a tendency towards sell transactions on Mondays relative to other weekdays, it is a reasonable to assume that a certain relationship exists between the trading patterns of individual investors and the Monday effect.

Might the returns on the last trading day of the week (especially Fridays) impact the following Monday's returns? There are several studies reporting returns from Fridays and the following Mondays are positively correlated. For example, Abraham & Ikenberry (1994) investigate the relationship between trading behavior of individual investors and the Monday effect and reports that when Friday returns are negative, nearly 80% of returns on the following Monday are also negative, with a mean return of -0.61%. When the Friday returns are positive, the subsequent Monday's average returns are positive. Furthermore, Brusa, Liu & Craig Schulman (2003) find that, in foreign markets, negative Monday returns tend to follow negative Friday returns; however, in the US market, positive Monday returns tend to follow positive Friday returns. As a result, it is a reasonable formulation that Friday returns impact the following Monday's returns; therefore, it can be predicted that Friday returns may be an influential factor in the Monday effect.

Recent finance studies examine the relationship between the levels of institutional and individual investors' holdings and the Monday effect. Chan, Leung & Wang (2004) find that institutional holdings in the US stock market significantly increased post-1990, and the anomaly also diminished from this point forward. Although there is a possibility that the decrease in the 1990s of the Monday effect might be attributed to the bull market during the period, they also find that stock portfolios with higher individual holdings experienced a stronger Monday effect than did stock portfolios with lower individual holdings. Moreover, Leung & Lee (2006) survey the relationship between institutional investors and the Monday effect on tourism stocks traded on the NYSE, AMEX and NSDAQ during 1981-1999 and indicate that the individual stocks with less institutional holdings were more likely to have negative Monday returns. In accordance with the above findings, this paper considers that the Monday effect is more likely to be experienced by institutional holdings of lower levels than higher levels. Might the movement of exchange rates be a factor causing the Monday effect? There is a large body of literature beginning to explore the relationship between stock returns and changes in foreign exchange rates in recent decades. However, the empirical findings from earlier studies reveal conflicting results. For example, Aggarwal (1981) finds that exchange rates have a positive correlation with stock returns, namely, as the US dollar depreciates, stock prices go down, and vice versa. Gian (1988) finds that the appreciation of New Taiwan Dollar (thereafter called NTD) will result in the edging up of the Weighted Price Index in the long run, but the opposite occurs in the short run. In addition, Morley (2002) demonstrates that there is a stable short-term relationship between exchange rates and stock returns for the UK countries. Due to the contradictory findings in previous literature and the lack of relative empirical research on this anomaly, this paper seeks to further explore the relationship. According to the above-mentioned literature, this paper makes the following hypotheses.

H₁: The Monday effect exists for TSE-traded tourism stocks.

H₂: The Monday effect results from the returns of the previous Friday.

H₃: The level of institutional holdings is negatively related to the Monday effect.

H₄: An exchange rate change is one of the variables to cause the Monday effect.

2. Data and method

2.1. Sample selection. This paper chooses tourism stocks as a research object. Stocks in this sample must meet two conditions. First, stocks must be listed on the TSE; Over The Counter (OTC) and Emerging Stock Market listings are disqualified. Second, stocks must have been listed on the TSE prior to February 1, 2011. In addition, the data collected are weekly data, and the research period is from January 1, 2001 to December 31, 2009, a total of nine years.

After defining the sample and research period, the data were collected. Data on individual tourism stocks were collected from the website of the Taiwan Stock Exchange Corporation. Then the necessary data were downloaded: (1) Daily returns of all individual tourism stocks, firms' market capitalization and the percentage of foreign and institutional holdings were collected from the Taiwan Economic Journal (TEJ); (2) The daily historical foreign exchange rates of the New Taiwan Dollar (NTD) against the United States Dollar (USD) were collected from the Taipei Foreign Exchange Market Development Foundation, and the daily exchange rate movement for each trading day was calculated. Finally, various data were merged into the same worksheet, and the days with insufficient data and the data of Tuesday through Friday were eliminated.

2.2. Method. The major objective of this paper is to investigate whether the Monday effect exists in tourism stocks. To examine this, a t-test and a multiple regression model are employed. In addition, this paper will use a robust test to confirm the empirical results of the analysis.

2.2.1. T-test. The commonly employed t-test, a One-Sample Test, will be carried out for examination of the Monday effect. This paper will use this approach to calculate the significance of Monday returns.

2.2.2. Multiple regression models. This paper will run a multiple regression model to directly investigate what factors cause the Monday effect. According to the hypotheses presented in Section 1, the models are as follows:

$$
\begin{aligned}
WeeklyMondayReturn = \beta_0 + \beta_1\, FIIHTSE + \\
+ \beta_2 log(cap) + \beta_3\, non\text{-}neg\, Friday\, ret + \\
+ \beta_4\, Tourism\, sector\, dummy + \\
+ \beta_5 Airline\, sector\, dummy + \beta_6 Delta + U,
\end{aligned} \tag{1}
$$

where *Weekly Monday Returns* is the dependent variable, meaning the weekly Monday returns of each stock; *FIIHTSE* are the shares held by foreign and institutional investors divided by outstanding shares; *log (cap)* means the natural logarithm of market capitalization (price multiplied by outstanding shares), which is a proxy of firm size. This study uses a natural logarithm to ensure all variables have a compatible order of magnitude: *non-neg Friday ret* is a dummy variable and equals 1 if individual stock returns on the previous Friday are non-negative, and 0 otherwise; *Tourism sector dummy* is a dummy variable and equals 1 is the stock belongs to the tourism sector, and 0 otherwise; *Airline sector dummy* is a dummy variable and equals 1 if the stock belongs to the airline sector; *Delta* equals the change in the volume of institutional holdings; *U* is an error term, β_0 is the intercept, and β_1 to β_6 are coefficients.

In equation (1), this paper uses the trading & consumer goods sector as the base case, so only two tourism stock dummy variables are necessary. This paper further distinguishes tourism stocks into two groups. One group has non-negative Friday stock returns; the other group has negative Friday returns. Equation (1) becomes:

$$
\begin{aligned}
WeeklyMondayReturn = \beta_0 + \beta_1\, FIIHTSE + \\
+ \beta_2 log(cap) + \beta_3\, Tourism\, sector\, dummy + \\
+ \beta_4 Airline\, sector\, dummy + \beta_5 Delta + U.
\end{aligned} \tag{2}
$$

In addition, for the purpose of examining whether the movement of exchange rate is one of the factors causing the Monday effect, equation (1) becomes the following:

$$
\begin{aligned}
WeeklyMondayReturn = \beta_0 + \beta_1\, FIIHTSE + \\
+ \beta_2 log(cap) + \beta_3\, non\text{-}neg\, Friday\, ret + \\
+ \beta_4\, Tourism\, sector\, dummy + \\
+ \beta_5 Airline\, sector\, dummy + \beta_6 Delta + \\
+ \beta_7 ex\text{-}rate + U,
\end{aligned} \tag{3}
$$

where *ex-rate* is the change of the exchange rate of the New Taiwan Dollar (NTD) against the United States Dollar (USD); other variables are the same as in equation (1).

In equation (1), in accordance with the empirical findings in the previous literature, in recent years,

institutional holdings have had an increasingly and significantly positive impact on market index; hence, this paper expects the coefficient β_1 to be positive. The previous Friday variable is a good indicator of whether the investor mood on the previous Friday will flow over to the following Monday, in particular, a bad announcement start spreading on Fridays. In addition, the literature indicates that positive Friday returns result in positive returns on the following Mondays, and vice versa; therefore, it is possible that the coefficient β_3 is either positive or negative, depending on the sign of the dependent variable.

3. Empirical results

This section will present the results of the T-test and the multiple regressions established in Section 2 and will add a robustness test to investigate the robustness of previous results.

3.1. The results with respect to descriptive statistics. Table 1 presents the composition of tourism stocks and their return characteristics. Panel A indicates that the number of available observations in each sample year is 19, except for in 2009, when the number is 20. Panel B displays the number of stocks in each category held by foreign and institutional investors. Panel C shows the return characteristics from 2001 to 2009. The annual return is the average daily return. The "No. of observation" is the number of years this paper observes. Max and Min denote the maximum and minimum returns over the period, while Mean denotes the average annual returns in each period. Panel C clearly indicates that the tourism sector has a higher risk than the trading & consumers goods and airline sectors. However, the mean return of 0.1007 for the trading & consumers goods sector is higher than those of the tourism and airline sectors, which are 0.0818 and 0.0538, respectively. As a result, Panel C reveals that the tourism

sector has the highest risk, while the trading & consumers goods sector has the highest mean annual returns. Both risk and mean annual returns are lowest for the airline sector. Figure 1 exhibits the fluctuation of annual returns in each sector.
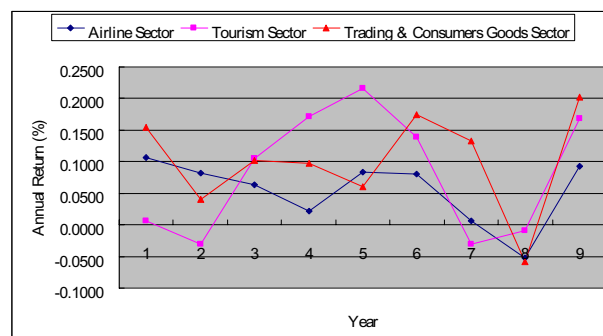

Fig. 1. Annual return of each sector

In Table 2, this paper presents summary statistics on the distribution of foreign and institutional investor holdings of tourism stocks. In panel A, the foreign and institutional holding is 7.7494 in 2001 and 16.3467 in 2007. For the years shown, the percentage of foreign and institutional holdings is monotonically increasing during the whole period, except a slight slide that occurs in 2009. This implies that foreign and institutional investors assume the tourism industry is booming in the 21st century in Taiwan. Panel B exhibits the foreign and institutional holdings in each sector. Foreign and institutional investor holdings in each sector roughly exhibit a positive slope prior to 2007 and maintain a stable volume in 2008 and 2009. According to the literature, foreign and institutional investors not only fund companies' operations and expansion but also actively supervise companies in management activity to reduce agent costs. As a result, increasing foreign and institutional holdings will contribute to reducing agent costs and increasing company values.

Table 1. Sample composition and stock return characteristics

	Year								
	2001	2002	2003	2004	2005	2006	2007	2008	2009
Panel A: A collection of tourism stocks									
No. of stocks with institutional investors	17	16	17	18	19	19	19	19	20
No. of stocks without institutional investors	2	3	2	1	0	0	0	0	o
% of stocks with institutional investors	89.47	84.21	89.47	94.74	100	100	100	100	100
No. of available observations	19	19	19	19	19	19	19	19	20
Panel B: No. of stocks in each category held by foreign investment									
Tourism sector	5	5	5	6	6	6	6	6	7
Trading & consumers goods sector	10	9	10	10	10	10	10	10	10
Airline sector	2	2	2	2	3	3	3	3	3

Table 1 (cont.). Sample composition and stock return characteristics

Panel C: Annual returns of tourism stocks on TSE from 2001 to 2009 (%)					
Sector	No. of observation	Max	Min	Mean	Standard deviation
Tourism sector	9	0.2159	-0.0312	0.0818	0.0978
Trading & consumers goods sector	9	0.2028	-0.0583	0.1007	0.0793
Airline sector	9	0.1064	-0.0519	0.0538	0.0515

Source: No. of stocks traded in the TSE supplied by the Taiwan Security Exchange.

Table 2. Foreign and institutional investor holdings by year (%)

	Year				
	2001	2002	2003	2004	2005
Panel A: Foreign and institutional investor holdings for tourism stocks					
	7.7494	9.0872	9.7091	11.8609	13.2564
	Year				
	2006	2007	2008	2009	
	15.2474	16.3467	17.9555	16.1473	
Panel B: Foreign and institutional investor holdings in each sector					
	Year				
	2001	2002	2003	2004	2005
Tourism sector	10.4169	10.7796	12.3095	15.4935	17.0763
	Year				
	2006	2007	2008	2009	
	18.2823	20.1642	18.8929	17.4257	
	Year				
	2001	2002	2003	2004	2005
Trading & consumers goods sector	8.1485	9.4876	9.132	10.698	11.8001
	Year				
	2006	2007	2008	2009	
	14.6914	15.3406	17.9130	16.5958	
	Year				
	2001	2002	2003	2004	2005
Trading & consumers goods sector	1.0839	4.3683	6.4322	8.4717	10.4712
	Year				
	2006	2007	2008	2009	
	11.0304	12.0652	11.1798	11.6695	

3.2. The T-test results. Table 3 exhibits the equally weighted Monday returns by year. This table shows that none of the average Monday returns are significantly negative, but they are significantly positive in 2003 and 2005. During the whole period, the average Monday returns are significantly positive. Therefore, it is clear that the Monday effect does not exist in any of the sample years or in the period as a whole. The reasons for significantly positive Monday returns in 2003 and 2005 may be the ambitious tourism policies implemented by the Tourism Bureau Ministry of Transportation and Communication, Republic of China (Taiwan) in these years. For example, in 2003, this organization declared a goal of attracting 5 million visitors to Taiwan in 2008 and completed the "Doubling Tourist Arrivals Plan" in 2005. The number of policies implemented by this organization in 2003 and 2005 are 12 and 6, respectively. Because the policies announced in these two years were the most important policies impacting the development of tourism, they caused the Monday effect to not exist in 2003 and 2005.

The results in Table 3 are inconsistent with the findings from most of the literature that Monday returns are significantly negative but are similar to the finding of a reserve weekend effect in the US market after 1990, discovered by Brusa, Liu & Schulman (2003). Therefore, Hypothesis 1 is rejected.

Table 3. Equally weighted Monday returns by year

Year				
2001	2002	2003	2004	2005
-0.0285 (-0.284)	-0.0259 (-0.270)	0.4525 (5.195)***	-0.0109 (-0.116)	0.3177 (3.684)***
Year				
2006	2007	2008	2009	2001-2009
0.0346 (0.402)	0.0426 (0.486)	0.4835 (3.687)***	-0.0179 (-0.190)	0.1244 (3.832)***

Note: *, **,*** significant at 10%, 5% and 1% levels for a one-sample t-test.

Although Table 3 indicates that a "reverse" Monday effect appears in 2003 and 2005, it does not clearly show when the Monday effect disappears during the sample period. Table 4 addresses this issue by cutting the mean Monday returns into all possible intervals from 2001 to 2009. In other words, this paper presents the average Monday returns beginning in any year during the 2001-2009 period and ending in any year that is the same or later than the starting year. The year record in the first row of Table 4 indicates the starting year, and the first column specifies the ending year of the interval. For example, the mean Monday returns during the period of 2002-2006 is 0.1527% with a t-value of 3.902.

In Table 4, it is obvious that mean Monday returns are insignificantly negative for the intervals ending in 2002. This pattern does not agree with the intervals beginning from 2003 to 2005. Mean Monday returns are positive and significant for all intervals starting from 2003 and 2005. This conclusion holds for all intervals starting from 2004, except for 2004-2004. In addition, the intervals ending in 2008 exhibit significantly positive Monday returns regardless of the starting year. Although it is possible to arrive at different conclusions based on different intervals, it seems that the well-known Monday effect does not appear for any period beginning after 2001.

According to Table 2 (Panel A) the mean holding for tourism stocks by foreign and institutional investors nearly increase year by year. From Tables 2 and 4, it can be deduced that Hypothesis 3 does not hold. To reconfirm that H_3 does not hold, this section of the paper will divide the tourism stocks into three

portfolios, according to the percentage of institutional holdings for each stock. The mean portfolio returns in each period are presented in Table 5. In this table, a "high" portfolio is the one with the highest mean institutional holding, whereas a "low" portfolio is the one with the lowest mean institutional holding. Two clear patterns can be observed from Panel A. First, five out of nine years with "high" institutional holdings have average positive returns but are only significant in 2008, whereas two-thirds of the sample years with "low" institutional holdings have mean positive returns, and three out of six are significant. The "median" institutional holding has similar conditions as the "low" institutional holding. Second, compared with Table 3, average Monday returns are significantly positive in 2003, 2005 and 2008. However, Table 5 (Panel A) shows the returns with "median" and "low" institutional holdings in 2003 and 2005 are more significant than those with "high" institutional holdings. Comparing the "median" and "high" groups, "median" institutional holdings have more positive returns than "high" for six out of nine years. For the whole period, the "high" group has more significantly positive returns than the other groups. If institutions are divided into foreign investors, security investment trusts and dealers, the "low" groups all have more significant Monday return than the "high" groups for the whole period. From the above contradictory findings, it cannot be concluded that mean Monday returns have a negative relationship with the level of institutional holdings; therefore, regressions are employed for further examination.

Table 4. Average Monday returns for all intervals from 2001 to 2007

	Starting year								
	2001	2002	2003	2004	2005	2006	2007	2008	2009
Ending year									
2001	-0.0285 (-0.284)								
2002	-0.0271 (-0.392)	-0.0259 (-0.270)							
2003	0.1392 (2.552)**	0.2174 (3.355)***	0.4525 (5.195)***						
2004	0.1014 (2.150)*	0.1420 (2.659)**	0.2250 (3.492)***	-0.0109 (-0.116)					
2005	0.1436 (3.456)***	0.1844 (4.047)***	0.2548 (4.924)***	0.1503 (2.347)**	0.3177 (3.684)***				
2006	0.1276 (3.407)***	0.1572 (3.902)***	0.2031 (4.580)***	0.1159 (2.258)**	0.1805 (2.967)***	0.0346 (0.402)			
2007	0.1152 (3.344)***	0.1378 (3.765)***	0.1706 (4.310)***	0.0973 (2.195)*	0.1336 (2.671)**	0.0386 (0.629)	0.0426 (0.486)		
2008	0.1440 (4.166)***	0.1702 (4.628)***	0.2063 (5.189)***	0.1567 (3.540)***	0.2066 (4.122)***	0.1875 (3.129)***	0.2615 (3.316)***	0.4835 (3.687)***	
2009	0.1244 (3.832)***	0.1446 (4.222)***	0.1715 (4.682)***	0.1251 (3.123)**	0.1578 (3.566)***	0.1326 (2.619)**	0.1628 (2.672)**	0.2210 (2.770)**	-0.0179 (-0.190)

Note: *, **,*** significant at 10%, 5% and 1% levels for a one-sample t-test.

Table 5. The impact of institutional holdings on Monday returns of portfolios

	Year									
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2001-2009
Panel A: Overall in TSE										
High	-0.0376 (-0.218)	-0.0051 (-0.034)	0.2019 (1.495)	0.1050 (0.718)	0.2304 (1.652)	-0.0770 (-0.586)	0.2234 (1.509)	0.5663 (5.701)***	-0.0053 (-0.045)	0.1775 (3.957)***
Medium	0.0401 (0.227)	-0.0728 (-0.473)	0.7069 (4.615)***	-0.0857 (-0.534)	0.3309 (2.373)**	0.0271 (0.173)	0.0535 (0.394)	0.5012 (5.947)***	-0.0763 (-0.492)	0.1392 (2.267)*
Low	-0.1109 (-0.688)	0.0159 (0.081)	0.4371 (2.587)**	-0.0099 (-0.055)	0.3963 (2.303)**	0.1676 (1.097)	-0.1587 (-0.909)	0.3533 (2,591)*	0.1152 (0.695)	0.1176 (2.577)**
Panel B: Foreign investors on the TSE										
High	-0.0464 (-0.267)	0.0080 (0.053)	0.2032 (1.495)	0.1067 (0.723)	0.1958 (1.450)	-0.1107 (-0.825)	0.0415 (0.247)	0.5663 (5.701)***	0.1486 (1.744)	-0.0120 (-0.321)
Medium	0.0967 (0.619)	-0.0919 (-0.596)	0.7112 (4.616)***	-0.0860 (-0.534)	0.4070 (2.658)**	0.0266 (0.169)	0.1769 (1.145)	0.5012 (5.947)***	-0.1970 (-1.286)*	0.1158 (2.435)**
Low	-0.0013 (-0.633)	0.0137 (0.067)	0.4387 (2.587)**	-0.0099 (-0.055)	0.3616 (2.262)**	0.1990 (1.239)	-0.1382 (-0.785)	0.3738 (2.591)*	0.1512 (0.922)	0.1861 (3.489)**
Panel C: Security investment trusts on the TSE										
High	0.0435 (0.222)	-0.1053 (-0.748)	0.3579 (2.380)**	0.0066 (0.044)	0.2531 (1.966)	0.0865 (0.561)	0.2420 (1.500)	0.4977 (3.684)**	0.0809 (0.516)	0.1410 (2.704)**
Medium	-0.0162 (-0.093)	NA	NA	-0.0597 (-0.377)	0.2553 (1.893)	0.0243 (0.216)	0.0500 (0.433)	0.4134 (3.591)**	-0.1490 (-1.589)	0.1158 (2.435)**
Low	-0.0918 (-0.638)	NA	NA	0.0525 (0.275)	0.3438 (1.938)	0.0257 (0.149)	-0.1875 (-1.032)	0.5549 (7.032)***	-0.0034 (-0.017)	0.1674 (3.065)***
Panel D: Dealers on the TSE										
High	0.0264 (0.153)	0.0336 (0.211)	0.6376 (4.448)***	-0.0387 (-0.280)	0.1663 (1.244)	0.0646 (0.454)	0.2693 (1.780)	0.3497 (3.816)**	0.770 (0.470)	0.1410 (2.704)**
Medium	-0.0879 (-0.538)	-0.0799 (-0.493)	0.3011 (2.209)*	-0.0482 (-0.290)	0.2423 (1.690)	-0.0879 (-0.676)	0.0633 (0.416)	0.6079 (5.330)***	-0.1119 (-1.159)	0.1158 (2.435)**
Low	-0.0118 (-0.063)	0.0011 (0.006)	0.4190 (2.373)**	0.0524 (0.277)	0.5397 (3.213)***	0.1479 (0.808)	-0.2079 (-1.338)	0.4659 (4. 525)**	-0.1332 (-0.730)	0.1640 (2.976)***

Note: *, **, *** significant at 10%, 5% and 1% levels for a two-tailed one-sample t-test. NA – not available.

3.3. Regression analysis. In this section, this paper uses a multiple regression model to investigate whether there is any direct and causal relationship between Monday returns and variables. The discussion in the above sections shows a conflicting relationship between Monday returns and foreign institutional holding, while the coefficient for this variable (FIHTSE) is negative but insignificant. This may be because the level of foreign and institutional holdings of tourism stocks in each sample year are not as much as holdings in the general market or in other sectors, such as the electronic sector, suggesting institutions do influence the prices of tourism stocks as much as the general market index or other sectors. Because of the inexistence of the Monday effect, Hypothesis 2 is rejected, but the returns on Fridays are significantly and positively correlated to the following Mondays' returns. The coefficient of non-neg Friday ret is significantly positive, which indicates that positive returns on Fridays will lead to positive returns on the following Mondays, whereas negative Friday returns will lead to negative returns on the following Monday. The Delta coefficient is also significantly positive, suggesting institutions have higher holdings on Mondays than on the previous Fridays. Combining the significant positive coefficients of non-neg Friday ret and Delta, institutions tend to purchase stocks on Mondays when the returns on previous Fridays are positive. The dummy variables for the tourism and airline sectors are negative but are only significant for the airline sector. This shows that the airline sector has a significant impact on Monday returns.

Table 6. Regression analyses of established models on selected variables

Panel A: Regression results with weekly Monday return for tourism stocks (equation (1))							
Period	Intercept	FIIHTSE	Delta	Log (cap)	Non-neg Friday ret	Tourism dummy	Airline dummy	Adjusted R^2
2001-2009	-0.720 (-0.962)	-0.0007 (-0.261)	0.0003 (13.637)***	0.0708 (0.913)	0.373 (5.757)***	-0.0604 (-0.816)	-0.291 (-2.888)***	0.028

Panel B: Regression results with weekly Monday returns for all-inclusive tourism stocks (equation (2))							
Period	Intercept	FIIHTSE	Delta	Log (cap)	Tourism dummy	Airline dummy	Adjusted R^2	
As return on previous Friday before Monday > 0								
2001-2009	0.899 (0.885)	-0.0028 (-0.758)	0.0003 (11.821)***	-0.0524 (-0.498)	-0.0381 (-0.387)	-0.443 (-3.237)***	0.030	

Table 6 (cont.). Regression analyses of established models on selected variables

Panel B: Regression results with weekly Monday returns for all-inclusive tourism stocks (equation (2))							
As return on previous Friday before Monday < 0							
Period	Intercept	FIIHTSE	Delta	Log (cap)	Tourism dummy	Airline dummy	Adjusted R^2
2001-2009	-2.029 (-1.833)	0.0021 (-0.526)	0.0002 (7.568)***	0.198 (1.728)	-0.0942 (-0.840)	-0.146 (-0.986)	0.016

Note: *, **, *** significant at 10%, 5% and 1% levels for a two-tailed one-sample t-test.

3.4. Robust test. This section presents the results of equation (3) to investigate the relationship between the movement of exchange rates and the Monday effect. In this test, the coefficient of non-neg Friday ret is significantly positive and the Delta coefficient is also significantly positive, whereas the dummy variable for the airline sector is still significantly negative, which confirms the results of regression analyses. Because of the inexistence of a Monday effect, Hypothesis 4 is rejected, but the coefficient of the exchange-rate variable is significantly negative, implying that the increase in Monday returns coincides with the appreciation of the New Taiwan Dollar (NTD) and vice versa, following the findings of Mok (1993) and Su (1998).

Table 3 reveals that the returns on Monday are significantly positive, suggesting that the Monday effect does not exist. However, the regression analyses present positive Monday returns, which may be caused by the previous Fridays' positive returns and institutions tend to buy stocks on Monday. Due to the positive sign of the exchange-rate variable, it can be estimated that positive return on Monday may be result of the appreciation of NTD on Monday.

Table 7. The results of robust testing

Panel A: Robust test for regression 1									
Period	Intercept	FIIHTSE	Delta	Log (cap)	Non-neg Friday ret	Tourism dummy	Airline dummy	Ex-rate movement	Adjusted R^2
2001-2009	-0.652 (-0.887)	-0.0012 (-0.436)	0.0003 (13.078)***	0.0686 (0.901)	0.351 (5.509)***	-0.0645 (-0.886)	-0.290 (-2.931)***	-5.387 (-17.127)***	0.062
Panel B: Robust test for regression 2									
Period	Intercept	FIIHTSE	Delta	Log (cap)	Tourism dummy	Airline dummy	Ex-rate movement	Adjusted R^2	
As return on previous Friday before Monday > 0									
2001-2009	0.897 (0.899)	-0.0032 (-0.885)	0.0003 (11.193)***	-0.0495 (-0.478)	-0.0518 (-0.535)	-0.422 (-3.275)***	-5.396 (-12.330)***	0.061	
As return on previous Friday before Monday < 0									
Period	Intercept	FIIHTSE	Delta	Log (cap)	Tourism dummy	Airline dummy	Ex-rate movement	Adjusted R^2	
2001-2009	-1.932 (-1.780)	0.0016 (0.404)	0.0002 (7.430)***	0.352 (1.243)	-0.0857 (-0.779)	-0.143 (-0.980)	-5.334 (-11.851)***	0.054	

Note: *, **, *** significant at 10%, 5% and 1% levels for a two-tailed one-sample t-test.

Conclusion

The Monday effect is an interesting and puzzling anomaly in finance literature, and the puzzling discovery of persistent negative daily returns on Mondays draws numerous and sometimes conflicting explanations. However, the implementation of a two-day weekend policy in 2001 shortened the number of weekly transaction days; therefore, whether the Monday effect exists for tourism stocks has become an interesting issue. In addition, previous studies have seldom explored the relationship between Monday returns and the Monday exchange rate movements; thus, regarding exchange rate movement as a variable is the most distinguishing feature of this paper.

The empirical results report that the Monday effect does not exist for tourism stocks, which is contrary to most literature and supports the finding that a "reverse" Monday effect exists in the US market after 1990 (Brusa, Liu & Schulman, 2003). Thus, Hypothesis 1 is rejected. Second, the regression analysis shows the levels of institutional holdings and Monday returns are insignificantly negative, which is different from previous literature findings that institutions with higher holdings are weaker, resulting in a Monday effect. Third, the returns on the last trading day of the week (especially when it is a Friday) show a significantly positive relationship with Monday returns, supporting the finding that positive returns on Fridays lead to positive returns on the following Mondays, and vice versa (Ikenberry, 1994). Fourth, the Delta coefficient is also positive, suggesting that institutions tend to buy stocks on Monday. In addition, the empirical analysis indicates that only the airline sector has a significant impact on Monday returns. Moreover, the ro-

bustness test reveals that positive Monday returns coincide with the appreciation of New Taiwan Dollar (NTD), similar to the findings of Mok (1993) and Su (1998). It is known that Monday returns are positive in the whole period; as a result, it is a reasonable prediction that the returns on previous Fridays and the appreciation of the exchange rate on Mondays are factors causing Monday returns to be positive. From a management perspective, this paper does not support Agent Cost Theory, because insti-

tutional holdings and Monday returns present a negative correlation. Moreover, Friday and Monday returns are positively correlated, implying that, when Friday returns are positive, investors can make excess returns by purchasing tourism stocks on Fridays; or, when Friday returns are negative, investors can short tourism stocks on Friday to earn excess returns. In sum, as long as the investment strategy-making follows the information announcement from government, investors can easily earn excess returns.

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