

Negative Sentiment and the Lunar Moon Festival Effect!

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Abstract

We propose a new seasonal anomaly associated with the Lunar Moon Festival (LMF) and caused by negative sentiment. This effect not only reduces share turnover but also lowers return volatility and stock returns. It is strongest for China, Taiwan and South Korea where the LMF is a public or cultural holiday. Our results show that this effect is separated from the Gone Fishin' effect and cannot be explained by the Moon Phases effect. Moreover, it affects stock markets where overseas Chinese investors possess significant resources and persists in the subperiod – from January 1998 to June 2006.

Key Words: Seasonality, anomaly, moon phases, share turnover.

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1. Introduction

Several anomalies relating to holidays have been discovered in stock markets such as the holiday effect (e.g., Ariel (1990), Kim and Park (1994) and Brockman and Michayluk (1998)), the Abadir and Spierdijk (2005) festivity effect and the Hong and Yu (2006) Gone Fishin' (GF) effect. The studies indicate that pre-holiday stock returns are abnormally high. In addition, the holiday anomaly is an international effect as the results show that it exists in a number of equity markets including the US, New Zealand, Australia, the UK and Asian markets (e.g., Vos, Cheung and Bishop (1993), Mills and Coutts (1995), Easton (1990), Agrawal and Tandon (1994)). In particular, this holiday effect is a local phenomenon and independent of the US stock market (Cadsby and Ratner (1992), Kim and Park (1994), and Lucey (2005)).

Using a liquidity constraint approach, Abadir and Spierdijk (2005) report that, in the weeks preceding festivities, both trading volumes and stock returns are lower than in the rest of the year and then reverse after the festivities. Using 51 stock markets data, Hong and Yu (2006) introduce the GF effect. Trading activity, return volatility and stock returns are lowest in the summer since investors go on holidays. However, the evidence of this effect is scant in tropical markets although it is evident in many non-tropical markets. Different from these seasonal effects, a series of studies in behavioural finance have identified that the fluctuation in investors' mood induces changes in equity prices, and the recently discovered factors causing this fluctuation in mood can be categorized into (1) weather (2) biorhythms and (3) social events (Lucey and Dowling (2005)). The new effect discussed in this paper mainly results from social feelings relating to the uncertainty of future harvest and historical negative associations.

The most important cultural event for Chinese people is the Chinese Lunar New Year. The next most important one is the Lunar Moon Festival (LMF) which takes place

on the 15th August in the Chinese lunar calendar.¹ Chan, Khanthavit and Thomas (1996) indicate that cultural holidays exhibit a stronger impact than public holidays on stock markets. In this vein, several studies investigate stock market patterns around the Chinese New Year (Wong et al. (1990), Tong (1992) and Abadir and Spierdijk (2005)), so it may be of interest to test the LMF hypothesis since this cultural festival falls at a completely different time of the year in the western calendar.

The LMF may significantly influence stock market patterns since it is the second most meaningful festival in terms of culture, economics, and weather for the Chinese. The first contribution of this paper is that it proposes a novel seasonality that is distinct from existing ones since it encompasses two contradictory effects. On one hand, Chinese people are accustomed to spending a considerable amount of time visiting their family and friends and buying gifts for them around the LMF. The upshot is that Chinese investors may sharply reduce their trading activities on the stock markets. In this respect the LMF effect resembles the festivity or GF effects.

On the other hand, the LMF is associated with high uncertainty about future prospects and with negative connotations. Agriculture is the most important industry in China and accounted for 45% of the labor force in 2005 according to the CIA Factbook. The vegetables, grain and fruit planted during the previous year will have been harvested before the festival. A mood of uncertainty arises as no one knows the harvest outcome for the following year, thus leading to an increase in risk aversion. Since farmers are paid only after the produce is harvested and sold, creditors seek for the settlement of farmers' outstanding accounts or debts around the LMF. This causes negative associations around the time of the LMF, especially when the harvest is poor.

¹ The Lunar Moon Festival is also called as the Mid-Autumn Festival. Because the date of the Moon festival is based on the Chinese lunar calendar, the date of the festival in Western calendar time varies from year to year. In the latter framework, the festival usually takes place between the second week of September and the second week of October.

Finally, throughout Chinese history, capital punishment was generally scheduled between the middle of Autumn and Winter. Since the time of the Ching (Manchu) Dynasty, the review of the final trials in the local provinces was scheduled around the middle of lunar August or the date of the Lunar Moon Festival. This was followed by the execution of the sentences including capital punishment. The latter further exacerbates the pervasive negative feelings and sentiment around the time of the LMF. In this respect the public feeling of uncertainty and negative social atmosphere is what differentiates the LMF effect from both the festivity and GF effects. The impact on share turnover may be further exacerbated by spending time on visiting family and friends around the LMF.

Both psychological and economic studies have documented that mood or feeling has an impact on human evaluation, judgment and decision-making (Isen et al (1978), Zajonc (1980), Schwarz and Clore (1983), Schwarz (1990), Bechara et al (1997), Luce et al (1999) and Loewenstein et al (2001)). In particular, Frogas (1995) claims that feelings have greater influence on the more complex decisions. In the finance literature, a number of mood-induced phenomena have been documented such as the weather (the level of cloud cover or the times of heightened geomagnetic storms) effect by Saunders (1993), Hirshleifer and Shumway (2003) and Krivelyova and Robotti (2003), Kamstra et al (2000) winter blues effect and Kamstra et al (2003) daylight saving effect. They provide evidence that numerous factors cause bad mood and in turn higher risk aversion and lower stock returns. Specifically, Lucey and Dowling (2005) address that 'irrelevant' emotion is evidenced to influence decision-making. The upshot of all this is that Chinese investors may become more risk averse around the LMF due to the negative public feeling and social atmosphere. Consequently, share trading volume is expected to fall which in turn induces lower return volatility and stock returns. Analogously, Boyle and Walter (2003) find that there is a positive correlation between the results of the New Zealand national rugby team and the market index return. Nofsinger (2003) also

concludes that higher (lower) stock returns may be caused by the positive (negative) public emotion.

The second contribution of this paper is that we test for the LMF effect on stock market patterns in two groups of economies. More specifically, we test the hypothesis that share turnover, return volatility and stock returns decline in the two weeks around the LMF. We expect to find stronger effect in those economies such as China, South Korea, Taiwan and Hong-Kong in which the LMF is celebrated as a public festival.² Lin and Liu (2002) examine the impact of three main Chinese (lunar) festivals, the Dragon-boat Festival, Mid-Autumn festival and Chinese New Year, on the Taiwan market using the holiday repressor approach proposed by Bell and Hillmer (1983). In contrast to our findings, they found no evidence of the LMF effect for the TAIEX index. This could result from the failure of monthly data to reveal the pattern of the effect. We also predict a weaker LMF effect in those economies such as Malaysia, Indonesia and Singapore where overseas Chinese investors play a significant role in the stock markets. Our results indicate that the LMF effect is particularly striking in those economies where it is a public or cultural festival.

The LMF effect is a new seasonal effect. It is neither a holiday nor a festivity effect since a particular social atmosphere pervades this anomaly. Compared with the (one-day) public or bank holiday effect (also see Fosback (1976) and Lakonishok and Smidt (1988)), the LMF effect has an impact on the markets for two weeks which is much longer than the influence of the holiday effect although it is a one-day festival. In particular, the holiday effect displays abnormally high stock returns on the day preceding the holidays, but the LMF effect shows lower stock returns for two weeks – the week including the festival and the following week. More importantly, the holiday effect only

² Although the LMF is not an official public holiday in China, China is included in the group where the LMF is a public holiday as it is a cultural holiday for the Chinese and thus may have a strong impact.

prevails around market closure, but the LMF effect exists even when the equity markets are open such as China, Indonesia, Singapore and Malaysia.

The LMF effect is also quite distinct from the festivity effect uncovered by Abadir and Spierdijk (2005) in several dimensions. First, the official durations of the festivities considered by Abadir and Spierdijk (2005) are much longer than that of the LMF. They examined the Muslim Ramadan and Chinese New Year festivities that are celebrated for one month and two weeks respectively while the LMF is simply a one-day festival. Second, while the festivity effect is found to exhibit distinct dynamic patterns before, during and after festivities, the LMF effect displays consistently static features around the festival.

Third, the festivity effect statistically persists only in those markets in which the festival is a public holiday or celebrated by the majority. By contrast, the LMF effect manifests itself not only in those markets where the festival is a public holiday but also in the markets where it is not celebrated and the Chinese only account for a small percentage of population. Finally, the festivity effect is driven mainly by the liquidity constraint but the LMF effect is more complex. It is strongly influenced by uncertainty about future harvests and historical negative associations. It is worth noting that most market participants feel positive prospects (good mood) about future investment around Chinese New Year (CNY), so existing studies have widely documented that stock returns are higher on the days before and after CNY (Wong et al (1990), Tong (1992) and Abadir and Spierdijk (2005)).³ Therefore, different social moods around CNY and LMF cause different patterns in stock prices although the expenditure around CNY may be much higher than that around LMF.

³ Tong (1992) argues that the patterns of stock returns around Chinese New Year may partially result from the payment of bonus before Chinese lunar calendar year-end. However, companies in Taiwan also used to pay bonus before the LMF, but the pattern of the LMF effect is distinct from that of the Chinese New Year effect.

The Lunar Moon Festival is tied to the 15th of August in Chinese lunar calendar, so one may wonder if the LMF effect is a derivative of the moon phases (MP) effect. Recently, employing stock index returns of 48 markets, Yuan et al (2006) document a global phenomenon associated with the moon phases that stock returns around a full moon are significantly smaller than around a new moon. This is consistent with the results in Dichev and Janes (2003). However, they further indicate that this phenomenon is not related to trading volumes and return volatility that is contrary to the pattern of our LMF effect. In addition, according to their results of testing the effect for individual markets, there is no statistically significant difference between the stock returns around the full and new moon in Hong-Kong, China, Taiwan, South Korea, Malaysia and Thailand, where the LMF effect prevails. Consequently, the LMF effect in East Asian markets cannot be explained by the influence of the moon cycles, and this is also supported by our regression results when controlling for the MP effect.

Our results also indicate that the LMF effect is separated from the GF effect although the LMF falls during the summer period defined for the GF effect. Moreover, the LMF effect still prevails after 1998 when the agriculture becomes less important, and regret theory can provide a plausible explanation. Finally, the effect remains significant when the impact of Asian financial crisis is taken into account.

This paper is organized as follows. Section 2 describes the data and methodology for testing. Section 3 discusses the empirical results, and last section concludes.

2. Data and Methodology

We test the LMF effect for 8 East Asian markets. First, the LMF is an important public holiday in Hong-Kong, Taiwan and South Korea and the second most important festival in China. Therefore, we predict a strong LMF effect for these markets. Second, the East Asia Analytical Unit (1995) reports that the overseas Chinese control more than 60% of

share capital in a further group of four economies: Indonesia, Singapore, Malaysia and Thailand. This is despite the fact that they only account for 3.5%, 10% and 29% of population in Indonesia, Thailand and Malaysia respectively (East Asia Analytical Unit (1995)). Since the LMF is not a public holiday in these economies, we would not expect the evidence to be as strong as for above group.

In addition, another two markets, Philippines and Japan, are used as benchmark economies since they neither celebrate the LMF nor can they boast of a significant overseas Chinese population. The overseas Chinese only accounts for 2% and less than 1% of the population in Philippines and Japan, respectively, according to East Asia Analytical Unit (1995) and the CIA World Factbook. More importantly, the overseas Chinese in Philippines and Japan have very little impact on the share capital. These two economies are also used to distinguish between the LMF and the Gone Fishin' (GF) effects. The dates of the GF and LMF effects partly overlap⁴, and Hong and Yu (2006) find evidence of the GF effect in Japan and Philippines.

[Table 1 around here]

The data on latitude angles are collected from the CIA Factbook, and weekly financial data are downloaded from Datastream. Table 1 reports the summary statistics. The starting dates of the financial data vary as the availability of the variables for these markets differs in Datastream. The longest data span commences from January 1973 for Singapore, Hong-Kong and Japan and the shortest from January 1991 are for China. The number of firms shown in Table 1 is the time series average of stocks for each market from the start date up to 30 June 2006. To circumvent survival bias, the list of stocks for each market is generated by compiling the stocks in the active and dead files of the

⁴ The pattern of the Gone Fishin' effect is that share turnover, stock return and return volatility are lower in the summer than those in the remaining of a year as investors go on holidays. Summer is defined as the time in July, August and September for markets in the Northern Hemisphere but in January, February and March for those in the Southern Hemisphere.

Datastream. Generally speaking, the sample size employed in the paper is large by the standards of existing studies. Daily share turnover is the value of traded shares divided by the number of shares in issue. Average daily share turnover is calculated for a given week to avoid the different number of trading days in a week due to public holidays. Weekly stock returns are generated by the closing stock prices on Wednesdays, and weekly return volatility is the standard deviation of the daily stock returns in a given week.

Share turnover, return volatility and stock returns are employed as the dependent variable in the following panel regression model:

$$Dep_{i,t} = \beta * LMF_t + \lambda_i + v_t + \varepsilon_{i,t} \quad (1)$$

where $Dep_{i,t}$ is the dependent variable; LMF is set to 1 for the weeks including and following the LMF. The dummies, v_t , capture particular yearly trends, and λ_i is the firm-specific intercept. In order to control the impact of the January effect, the *Jan* dummy variable is included in the return regression, and *Jan* is set to unity for the months of January.

3. Empirical results

Table 2 reports the results from estimating our regression equations for share turnover, return volatility and stock returns:

[Table 2 around here]

The LMF hypothesis is strongly supported by the results. The coefficients on LMF are all both statistically and economically significant in virtually all regressions for these markets (Hong-Kong, China, Taiwan and South Korea) where the festival is a public or cultural holiday. For instance, share turnover falls by 37% in Taiwan and by an average of some 20% in all four economies during the festival weeks. Similarly, return volatility and returns are reduced by an average of 10% and 1%, respectively. It is noteworthy that

the absolute values of the LMF coefficients for Hong-Kong are smaller than those for the other markets, which may reflect the lack of importance of agriculture⁵ in Hong-Kong and its status as a British colony for the 150 years up to 1997.

Panel B in Table 2 shows significant but weaker evidence of the LMF effect in the four economies where overseas Chinese dominate the stock markets. The strongest effects are a 14% average reduction in share turnover and a 0.6% average fall in stock returns for Indonesia, Malaysia and Singapore. Thailand is an exception with a perversely positive impact on both stock volatility and returns and no impact on share turnover. The coefficient on return volatility is also positive for Indonesia and insignificant for the others. Finally, we test for the LMF effect in the Philippines and Japan where overseas Chinese are much fewer and do not dominate the stock markets and the LMF is not celebrated. The results in Panel C show scant evidence of the LMF effect in these two markets.

Equation (1) is re-estimated by controlling for the impact of the Asian financial crisis in 1997 to exam whether this effect is related to the financial shock. In addition, the data sets are limited from January 1998 to June 2006 to investigate whether its impact still prevails in the past 8 years. The results show that the 1997 Asian financial shock has little explanatory power, and the LMF coefficients in the share turnover, return volatility and stock return are still significantly negative except for Hong-Kong and Singapore between January 1998 and June 2006.⁶ Again, the disappearance of the effect in these two markets after 1998 could be because of the lack of importance of agriculture. It is interesting that the LMF effect in two markets, China and Taiwan, are even stronger after 1998. These imply that the LMF anomaly remains active in the past 8 years even when

⁵ The Census and Statistics Department (2007) reports that agriculture in Hong-Kong accounts for less than 0.5% of total employment.

⁶ We also test the LMF effect from January 1991 to June 2006 after controlling for the impact of the 1997 Asian financial shock, and the results also indicate that the effect prevails in the past 15 years except for Hong-Kong. For brevity, the detailed results are not reported but are available upon request.

agriculture is becoming less important and a modern legal system is growing in emerging markets.

A plausible explanation for this phenomenon is the application of the regret theory. The regret theory is documented in both psychology (see Kahneman and Tversky (1982), Landman (1987), Gleicher et al (1990), Gilovich and Medvec (1995)) and finance literature (Bell (1981, 1982, 1983, 1985) and Loomes and Sugden (1982, 1987a, 1987b)). Dodonova and Khoroshilov (2005) incorporate this theory into an asset pricing model and then successfully explain a couple of pricing puzzles in the pure rational representative framework. The main interpretation of this theory in finance is that people may experience regret if their decisions induce negative outcomes, and the regret-averse investors consequently will adjust their investment strategy to insure themselves against previous bad performance. In terms of the LMF effect, regret-averse investors tend to reduce their positions around the Lunar Moon Festival to avoid loss when they previously experienced negative returns due to the LMF effect. That may be why the effect still exists when agriculture is less important and law system is changing, and this is further supported by the finding that the LMF effect even becomes stronger in China and Taiwan markets in post-1998 period.

4. Robustness Checks

4.1 LMF vs. GF effects

One might argue that the LMF effect is driven by the GF effect for the markets in Panels A and B of Table 2. To distinguish the LMF and GF effects further, another six panel regression models are estimated for the ten East Asian markets and take the following two formats with three dependant variables

$$Dep_{i,t} = \beta * Summer_t + \lambda_i + \nu_t + \varepsilon_{i,t} \quad (2)$$

$$Dep_{i,t} = \beta_1 * Spring_t + \beta_2 * Fall_t + \beta_3 * Winter_t + \lambda_i + \nu_t + \varepsilon_{i,t} \quad (3)$$

where $Dep_{i,t}$ represents the dependent variables, log share turnover, log return volatility and stock return for the regression models; *Spring*, *Summer*, *Fall* and *Winter* are seasonal dummies⁷ and the dummy variable, *Jan*, is also included in the return regression to control for the influence of the January effect on stock returns.

[Table 3 and 4 around here]

According to the GF hypothesis, we expect a significantly negative *Summer* coefficient and significantly positive coefficients on the *Spring*, *Fall* and *Winter*. Interestingly, our results in Table 3 and 4 indicate that the LMF effect is not driven by the GF effect as we can find evidence of the LMF effect for Indonesia, Singapore and Malaysia where there is scant evidence of the GF effect. Again, there is no support for the LMF effect for the Philippines and Japan where the GF effect is significant.⁸

Since both the LMF and GF effects impact in Hong-Kong, Taiwan, China and South Korea, we investigate whether the LMF effect is a part of the more general GF effect for these markets. To test this, the following three panel regressions are estimated:

$$\log st_{i,t} = \beta_1 * LMF_{i,t} + \beta_2 * GFX_{i,t} + \lambda_i + \nu_t + \varepsilon_{i,t} \quad (4)$$

$$\log Vol_{i,t} = \beta_1 * LMF_{i,t} + \beta_2 * GFX_{i,t} + \lambda_i + \nu_t + \varepsilon_{i,t} \quad (5)$$

$$Ret_{i,t} = \beta_1 * LMF_{i,t} + \beta_2 * GFX + \beta_3 * Jan + \lambda_i + \nu_t + \varepsilon_{i,t} \quad (6)$$

where *GFX* is set to one during all the summer weeks excluding the two LMF weeks.

Moreover, we test the hypothesis that the *LMF* and *GFX* coefficients are the same. Table

⁷ The setting of the seasonal dummies follows the definition in Hong and Yu (2006). (1) the *spring* dummy is equal to one when the time is April, May and June; (2) the *summer* dummy is equal to one when the time is July, August and September; (3) the *fall* dummy is equal to one when the time is October, November and December; (4) the *winter* dummy is equal to one when the time is January, February and March. However, Indonesia is in the Southern Hemisphere. Therefore, the seasons for Indonesia are defined as follows: (1) Spring is in October, November and December; (2) Summer is in January, February and March; (3) Fall is in April, May and June; (4) Winter is in July, August and September.

⁸ There is no evidence of both LMF and GF effects for Thailand.

5 presents the results.

[Table 5 around here]

It shows that the absolute value of the *LMF* coefficient is consistently and statistically larger than the *GFX* coefficient for all markets except Hong-Kong. The average *LMF* impact on share turnover is some 23.2% as compared with 15.65% for the *GF* effect. Moreover, the average *LMF* coefficient is more than three times larger than the *GFX* coefficient in the return volatility and stock return regressions. These imply that the *LMF* effect is a new seasonality effect which is distinct from and stronger than the *GF* effect in those economies in which it is celebrated as a public or cultural holiday in lunar August.

4.2 *LMF* vs. *MP* effects

Motivated by the biological and psychological findings that human mood and behaviour can be influenced by the lunar cycles (e.g., Criss and Marcum (1981), Hicks-Caskey and Potter (1991), Sands and Miller (1991), de Castro and Pearcey (1995)), Dichev and Janes (2003) and Yuan et al (2006) investigate the impact of moon cycles on market index returns. They found a moon phases (*MP*) effect that the difference between the stock returns on the new moon dates and those on the full moon dates is statistically significant. In addition, Figure 2 in Yuan et al (2006) clearly shows that the index returns on the days close to a full moon reaches a minimum while those on the days close to a new moon increase to the peak. The Chinese lunar calendar is also scheduled on the basis of the moon phases, and thus it is of interest to have an insight into whether the *LMF* effect is a derivative of the *MP* effect.

To implement this robust test for the *LMF* effect, we re-estimate the Equations (4), (5) and (6) by replacing the dummy of *GFX* with *MP*. Following the methodology suggested by Dichev and Janes (2003), the dummy variable, *MP*, is set to be unity when

the week includes a full moon and zero otherwise⁹. Here, in order to have comparable results, the full moon dates are also employed from the United States Naval Observatory (USNO) website, which is consistent with the data in Yuan et al (2006).

[Table 6 around here]

According to Table 6, the results of testing the MP effect are in support of those in Dichev and Janes (2003) and Yuan et al (2006). Firstly, most of the MP coefficients in the share turnover and return volatility regressions are positive and statistically or economically insignificant, showing that the MP effect is not associated with trading volume and return volatility. This is in contrast to the patterns of the LMF effect as the LMF effect has strong impact on the share turnover and return volatility. Secondly, the MP effect does not prevail in these East Asian markets except South Korea and Indonesia as the MP coefficients in the stock return regressions are statistically or economically insignificant except Indonesia and South Korea.¹⁰ However, the LMF coefficients remain statistically and economically significantly negative. Moreover, the magnitudes of panel coefficients on LMF in Table 6 do not decrease at all if those in Tables 2 are compared. These imply that the impact of the LMF effect does not weaken after controlling the influence of the MP effect. Therefore, the LMF effect in these East Asian stock markets cannot be explained by the MP effect.

5. Conclusions

In line with the findings in the finance literature that the fluctuation in social mood can play an important role in stock markets, we propose a new seasonal anomaly associated with the Lunar Moon Festival (LMF) around. Both the increased expenditure and

⁹ Dichev and Janes (2003) use the method to test the MP effect in terms of the interest rate.

¹⁰ Dichev and Janes (2003) find no statistically significant evidence of the MP effect in Thailand, Hong-Kong, Malaysia, South Korea and Taiwan. Similarly, the results in Yuan et al (2006) also show that the MP effect do not prevail in China, South Korea and Malaysia. Moreover, both of their results show that the MP effect exists in Indonesia, which is supported by our empirical findings.

pervasive negative mood and sentiment around this festival have the effect of reducing share turnover primarily but they also lower return volatility and stock returns. Our empirical results using the longest available data spans indicate that the effect is strongest for China, Taiwan and South Korea where the LMF is a public or cultural holiday.

Moreover, it is significantly separated from the Hong and Yu (2006) Gone Fishin' effect in these markets, and our results show that it is not the derivative of the Moon Phases effect. More importantly, this mood-induced phenomenon persists in the past decade when agriculture is less important in these markets, and it has an even greater impact on the Chinese and Taiwanese markets. This may be because regret-averse investors attempt to reduce their positions and trading activities to avoid bad investment performance which they have experienced previously around the LMF. Finally, the LMF effect also impacts on neighbouring stocks markets where overseas Chinese investors possess significant economic resources.

References

Abadir, K.M. and L. Spierdijk, 2005, Liquidity constraints and the demand for assets: An application to the festivity effect, SSRN Working Paper Series.

Agrawal, A. and K Tandon (1994), Anomalies or Illusions? Evidence from Stock Markets in Eighteen Countries, *Journal of International Money and Finance* 13, 83-106.

Ariel, R.A., 1990, High stock returns before holidays: Existence and evidence on possible causes, *Journal of Finance* 45, 1611-1626.

Bechara, A., A. Damasio, D. Tranel and A.R. Damasio (1997), Deciding advantageously before knowing the advantageous strategy, *Science* 275, 1293-1295.

Bell, D.E. (1981), Explaining utility theory paradoxes by decision regret, in J. Morse (Edition), *Proceedings of the Fourth International Conference on Multiple Criteria Decision Making*, 28-29, New York: Springer.

Bell, D.E. (1982), Regret in decision making under uncertainty. *Operations Research*, 30, 961-981.

Bell, D.E. (1983), Risk premiums for decision regret. *Management Science* 29, 1156-1166.

Bell, D.E. (1985), Putting a premium on regret, *Management Science* 31, 117-120.

Bell, W.R. and S.C. Hillmer, 1983, Modeling Time Series with Calendar Variation, *Journal of the American Statistical Association*, 78, 526-534.

Boyle, G. and B. Walter (2003), Reflected glory and failure: International sporting success and the stock market, *Applied Financial Economics* 13, 225-235.

Brockman, P. and D. Michayluk, 1998, The persistent holiday effect: Additional evidence, *Applied Economics Letters* 5, 205-209.

Cadsby, C. B. and Ratner M. (1992), Turn-of-month and Pre-holiday Effects on Stock Returns: Some International Evidence, *Journal of Banking and Finance* 16, 497-509.

Census and Statistics Department, 2007, Hong-Kong in Figures. (Census and Statistics Department, Hong Kong Special Administrative Region).

Chan, M., A. Khanthavit and H. Thomas, 1996, Seasonality and cultural influences on four Asian stock markets, *Asia Pacific Journal of Management* 13, Vol. 2 1-24.

Criss, T.B. and J.P. Marcum, 1981, A Lunar effect on fertility, *Social Biology* 28, 75-80.

Dodonova, A. and Y. Khoroshilov (2005), Applications of Regret Theory to Asset Pricing, University of Ottawa and University of Michigan, Working paper.

De Castro, J.M. and S.M. Pearcey, 1995, Lunar rhythms of the mean and alcohol intake of humans, *Physiology and Behaviour* 57, 439-444.

Dichev, I.D. and T.D. Janes, 2003, Lunar Cycle Effects in Stock Returns, *Journal of Private Equity* 6, 8-29.

East Asia Analytical Unit, 1995, Overseas Chinese Business Networks in Asia. (Department of Foreign Affairs and Trade, Australia).

Easton, S. (1990), Returns to Equity before and after Holidays: Australian Evidence and Tests of Plausible Hypotheses, *Australian Journal of Management* 15 (2), 281- 296.

Fosback, N. (1976), 'Stock Market Logic', Institute for Econometric Research, Fort Lauderdale, p156.

Gleicher, F., K.A. Kost, S.M. Baker, A.J. Strathman, S.A. Richman and S.J. Sherman (1990), The role of counterfactual thinking in judgments of affect, *Personality and Social Psychology Bulletin* 16, 284-295.

Gilovich, T. and V.H. Medvec (1995), The experience of regret: What, When and Why, *Psychological Review* 102, 379-395.

Hicks-Caskey, W.E. and D.R. Potter, 1991, Weekends and holidays and action-out behaviour of developmentally delayed women: A reply to Dr. Mark Flynn, *Perceptual and Motor Skills* 74, 1375-1380.

Hirshleifer, D. and T. Shumway, 2003, Good day sunshine: Stock returns and the weather, *Journal of Finance* 58, Vol. 3 1009-1032.

Hong, H.G. and J. Yu, 2006, Gone Fishin'? Seasonality in trading activity and asset prices, SSRN Working Paper Series.

Isen, A.M., T.E. Shalke, M. Clark and L. Karp (1978), Affect, accessibility of material in money, and behaviour: A cognitive loop?, *Journal of Personality and Social Psychology* 36: 1-2.

Kahneman, D. and A. Tversky (1982), The psychology of preferences, *Scientific American* 246, 160-173.

Kamstra, M.J., L.A. Kramer and M.D. Levi, 2000, Losing sleep at the market: The daylight saving anomaly, *American Economic Review* 90 (4), 1005-1011.

Kamstra, M.J., L.A. Kramer and M.D. Levi, 2003, Winter blues: A SAD stock market cycle, *American Economic Review* 93 (1), 324-343.

Kim, C.W. and J. Park, 1994, Holiday effects and stock returns: Further evidence, *Journal of Financial and Quantitative Analysis* 29, Vol. 1 145-157.

Krivelyova, A. and C. Robotti (2003), Playing the field: Geomagnetic storms and international stock markets, SSRN working paper series.

Lakonishok, J. and S. Smidt (1988), 'Are seasonal anomalies real? A ninety-year perspective', *Review of Financial Studies*, 1: 403-425.

Landman, J. (1982), Regret: A theoretical and conceptual analysis, *Journal for the Theory of Social Behaviour* 17, 135-160.

Lin, J. and T. Liu (2002), Modeling Lunar Calendar Holiday Effects in Taiwan, Working paper, Academia Sinica and Executive Yuan, R.O.C

Loewenstein, G., E.U. Weber, C.K. Hsee and N. Welch (2001), Risk as feelings, *Psychological Bulletin* 127, 267-286.

Loomes, G. and R. Sugden (1982), Regret theory: An alternative theory of rational choice under uncertainty, *Economic Journal* 92, 805-824.

Loomes, G. and R. Sugden (1987a), Some implications of a more general form of regret theory, *Journal of Economic Theory*, 41, 270-287.

Loomes, G. and R. Sugden (1987b), Testing for regret and disappointment in choice under uncertainty, *Economic Journal* 97, 118-129.

Luce, M.F., J.W. Payne and J.R. Bettman (1999), Emotional trade-off difficulty and choice, *Journal of Marketing Research* 36, 143-159.

Lucey, B. M. (2005), Are Local or International Influences Responsible for the Pre-holiday Behavior of Irish Equities?, School of Business Studies and Institute for International Integration Studies Discussion Paper, University of Dublin.

Lucey, B. M. and M. Dowling (2005), The role of feelings in investor decision-making, *Journal of Economic Surveys* 19, 211-237.

Mills, T. and J. A. Coutts (1995), Calendar Effects in the London Stock Exchange FT-SE Indices, *European Journal of Finance* 1, 79-93.

Nofsinger, J.R. (2003), Social mood and financial economics, Washington State University working paper.

Sands, J.M. and L.E. Miller, 1991, Effects of moon phase and other temporal variables on absenteeism, *Psychological Reports* 69, 959-962.

Schwarz, N. (1990), Feelings as information: Informational and motivational functions of affective states, In E.T. Higgins (edited), *Handbook of Motivation and Cognition*, New York: Guildford Press.

Schwarz, N. and G.L. Clore (198), Mood, misattribution, and judgments of well-being: Informative and directive functions of affective states, *Journal of Personality and Social Psychology* 45, 513-523.

Sounders, E.M. (1993), Stock prices and wall street weather, *American Economic Review* 83, 1337-1345.

Tong, W., 1992, An analysis of the January effect of the United States, Taiwan and South Korean stock returns, *Asia Pacific Journal of Management* 9, 189-207.

Vos, E., J. Cheung and D. Bishop (1993), Pre-Holiday Returns in the New Zealand Share Market, *Accounting Research Journal* 7, 21-26.

Wong, P.L., S.K. Neoh, K.H. Lee and T.S. Thong, 1990, Seasonality in the Malaysian stock market, *Asia Pacific Journal of Management* 7, 43-62.

Yuan, K., L. Zheng and Q. Zhu, 2006, Are Investors Moonstruck? Lunar Phases and Stock Returns, *Journal of Empirical Finance*, 13 (1), 1-23.

Zajonc, R.B. (1980), Feeling and thinking: Preferences need no inferences, *American Psychologist* 35, 151-175.

Table 1: Descriptive Statistics

Market	Latitude	Starting date	NO. of Firms	Share turnover	Return	Return volatility
Indonesia	-5	1990/04	251	0.018 (0.553)	0.007 (0.117)	0.036 (0.051)
Singapore	1.22	1973/01	262	0.014 (0.676)	0.003 (0.075)	0.025 (0.031)
Malaysia	2.3	1984/12	499	0.010 (0.509)	0.002 (0.086)	0.026 (0.028)
Philippines	13	1984/12	174	0.047 (0.671)	0.007 (0.107)	0.028 (0.043)
Thailand	15	1987/02	538	0.022 (0.203)	0.003 (0.090)	0.026 (0.033)
Hong-Kong	22.15	1973/01	373	0.004 (0.034)	0.004 (0.091)	0.028 (0.032)
Taiwan	23.3	1987/09	609	0.035 (1.000)	0.001 (0.075)	0.024 (0.016)
China	35	1991/01	673	0.022 (0.591)	0.001 (0.063)	0.023 (0.016)
Japan	36	1973/01	2072	0.035 (1.236)	0.003 (0.066)	0.021 (0.023)
South Korea	37	1980/01	815	0.041 (0.484)	0.004 (0.103)	0.032 (0.026)

Note: The number of firms is the time series average of stocks for each market from the start date up to 30 June 2006. Daily share turnover is the value of traded shares divided by number of shares in issue. Average daily share turnover is calculated for a given week to avoid the different number of trading days in a week due to public holidays. Weekly stock returns are generated by the closing stock prices on Wednesdays, and weekly return volatility is the standard deviation of the daily stock returns in a given week. The average of the share turnover, stock return and return volatility in a given week are reported in the table, and their standard deviations are given in the parentheses.

Table 2. Lunar Moon Festival Effects

Panel A: LMF Celebrated Markets (Group one)

Market	Share Turnover	Return Volatility	Stock Return	
	LMF	LMF	LMF	Jan
Hong-Kong (22.15)	-0.049** (0.011)	-0.019** (0.006)	0.000 (0.001)	0.003** (0.001)
Taiwan (23.3)	-0.370** (0.009)	-0.091** (0.005)	-0.016** (0.000)	0.017** (0.000)
China (35)	-0.230** (0.007)	-0.084** 0.005	-0.018** (0.000)	0.001** (0.000)
South Korea (37)	-0.195** (0.007)	-0.152** (0.004)	-0.007** (0.001)	0.010** (0.000)
Panel Coef.	-0.195** (0.004)	-0.095** (0.003)	-0.009** (0.000)	0.008** (0.000)

Panel B: Overseas Chinese dominated Markets (Group two)

Market	Share Turnover	Return Volatility	Stock Return	
	LMF	LMF	LMF	Jan
Indonesia (-5)	-0.153** (0.024)	0.054** (0.014)	-0.014** (0.002)	0.008** (0.001)
Malaysia (2.3)	-0.195** (0.010)	-0.001 (0.006)	-0.006** (0.001)	0.009** (0.000)
Singapore (1.22)	-0.056** (0.012)	0.004 (0.007)	-0.003** (0.000)	0.004** (0.001)
Thailand (15)	0.015 (0.014)	0.047** (0.008)	0.009** (0.001)	0.012** (0.001)
Panel Coef.	-0.097** (0.007)	0.016** (0.004)	-0.002** (0.000)	0.008** (0.000)
Panel Coef. Excluding Thailand	-0.138** (0.008)	0.007 (0.004)	-0.006** (0.000)	0.007** (0.000)

Panel C: LMF non-celebrated and Non-Chinese-dominated markets (Group 3)

Market	Share Turnover	Return Volatility	Stock Return	
	LMF	LMF	LMF	Jan
Philippines (13)	-0.044* (0.026)	0.015 (0.015)	-0.002 (0.002)	0.009** (0.001)
Japan (36)	0.008** (0.003)	0.005** (0.002)	-0.002** (0.000)	0.010** (0.001)
Panel Coef.	0.006* (0.004)	0.005** (0.002)	-0.002** (0.000)	0.010** (0.000)

Note: We estimate the following panel regression model with share turnover, return volatility and stock returns used as the dependent variable: $Dep_{i,t} = \beta * LMF_t + \lambda_i + v_t + \varepsilon_{i,t}$ where $Dep_{i,t}$ is the dependent variable; LMF is set to 1 for the weeks including and following the LMF. The dummies, v_t , capture particular yearly trends, and λ_i is the firm-specific intercept. For the return regression, the *Jan* dummy is included to control the January effect. Panel Coef. is the coefficient in the regression estimated using the data set including all the markets in a group.
* Indicate significance at 10% levels; ** Indicate significance at 5% levels.

Table 3. The Gone Fishin' Effect (1)

Market	Share Turnover	Return Volatility	Stock Return	
	Summer	Summer	Summer	Jan
Indonesia (-5)	0.103** (0.011)	0.001 (0.006)	0.003** (0.001)	0.006** (0.002)
Singapore (1.22)	0.011** (0.005)	0.003 (0.003)	-0.007** (0.000)	0.003** (0.001)
Malaysia (2.3)	-0.049** (0.004)	-0.005* (0.003)	0.000 (0.000)	0.009** (0.001)
Philippines (13)	-0.055** (0.011)	-0.027** (0.007)	-0.007** (0.001)	0.007** (0.001)
Thailand (15)	0.013** (0.006)	-0.013** (0.004)	-0.001 (0.000)	0.012** (0.001)
Hong-Kong (22.15)	-0.044** (0.005)	-0.017** (0.003)	-0.003** (0.000)	0.002** (0.000)
Taiwan (23.3)	-0.273** (0.004)	-0.010** (0.002)	-0.009** (0.000)	0.015** (0.000)
China (35)	-0.146** (0.003)	-0.059** (0.002)	-0.002** (0.000)	0.001** (0.000)
Japan (36)	-0.055** (0.002)	-0.041** (0.001)	-0.005** (0.000)	0.008** (0.000)
South Korea (37)	-0.192** (0.003)	-0.052** (0.002)	-0.005** (0.000)	0.009** (0.000)

Note: We estimate the following panel regression model with share turnover, return volatility and stock returns used as the dependent variable: $Dep_{i,t} = \beta * Summer_{i,t} + \lambda_i + v_t + \varepsilon_{i,t}$ where $Dep_{i,t}$ is the dependent variable; The closing stock prices on Wednesdays are taken to generate the weekly stock return, Ret . The daily share turnover is defined as trading shares divided by number of shares in issue. The weekly average share turnover, st , is calculated for a given week to avoid the different number of trading days in a week caused by the public holidays. The weekly return volatility is the standard deviation of the daily stock returns in a given week generated by the daily closing stock price. The dummies, v_t , capture particular yearly trends, and λ_i is the firm-specific intercept. For the return regression, the *Jan* dummy is included to control the January effect. Summer is a seasonal dummy variable which is set to be unity when the time is in the summer and zero otherwise; standard errors are given in the parentheses. * Indicate significance at 10% levels; ** Indicate significance at 5% levels.

Table 4. The Gone Fishin' Effect (2)

Market	Share Turnover $\log st_{i,t} = \beta_1 * Spring_{i,t} + \beta_2 * Fall_{i,t} + \beta_3 * Winter_{i,t} + \lambda_i + \nu_t + \varepsilon_{i,t}$			Return Volatility $\log Vol_{i,t} = \beta_1 * Spring_{i,t} + \beta_2 * Fall_{i,t} + \beta_3 * Winter_{i,t} + \lambda_i + \nu_t + \varepsilon_{i,t}$			Stock Return $Ret_{i,t} = \beta_1 * Spring_{i,t} + \beta_2 * Fall_{i,t} + \beta_3 * Winter_{i,t} + \beta_4 * Jan_{i,t} + \lambda_i + \nu_t + \varepsilon_{i,t}$			
	Spring	Fall	Winter	Spring	Fall	Winter	Spring	Fall	Winter	January
Indonesia (-5)	-0.267** (0.013)	0.072** (0.013)	-0.147** (0.013)	0.022** (0.008)	0.004 (0.008)	-0.029** (0.008)	-0.004** (0.001)	0.005** (0.001)	-0.012** (0.001)	0.006** (0.002)
Singapore (1.22)	0.000 (0.006)	-0.135** (0.007)	0.108** (0.007)	-0.035** (0.004)	0.014** (0.004)	0.012** (0.004)	0.007** (0.000)	0.006** (0.000)	0.008** (0.000)	0.001** (0.001)
Malaysia (2.3)	0.038** (0.005)	-0.085** (0.005)	0.207** (0.005)	-0.020** (0.003)	-0.004** (0.003)	0.042** (0.003)	-0.003** (0.000)	-0.000 (0.000)	0.004** (0.000)	0.005** (0.001)
Philippines (13)	0.050** (0.014)	-0.008 (0.014)	0.124** (0.014)	0.004 (0.008)	0.020** (0.008)	0.057** (0.008)	0.004** (0.001)	0.005** (0.001)	0.013** (0.001)	0.001 (0.002)
Thailand (15)	-0.008 (0.008)	-0.143** (0.008)	0.119** (0.008)	-0.014** (0.005)	-0.000 (0.005)	0.053** (0.005)	0.001 (0.001)	0.001 (0.001)	0.000 (0.001)	0.012** (0.001)
Hong-Kong (22.15)	0.093** (0.006)	-0.046** (0.006)	0.093** (0.006)	0.003 (0.003)	-0.000 (0.003)	0.052** (0.003)	0.002** (0.000)	0.002** (0.000)	0.007** (0.000)	-0.002** (0.001)
Taiwan (23.3)	0.339** (0.005)	0.002 (0.005)	0.522** (0.005)	0.032** (0.003)	-0.051** (0.003)	0.058** (0.003)	0.002** (0.000)	0.010** (0.000)	0.017** (0.000)	0.007** (0.000)
China (35)	0.387** (0.004)	-0.105** (0.004)	0.183** (0.004)	0.154** (0.002)	-0.012** (0.002)	0.063** (0.002)	0.006** (0.000)	-0.003** (0.000)	0.006** (0.000)	-0.003** (0.000)
Japan (36)	0.083** (0.002)	0.006** (0.002)	0.078** (0.002)	0.030** (0.001)	0.037** (0.001)	0.056** (0.001)	0.007** (0.000)	-0.000* (0.000)	0.008** (0.000)	0.005** (0.000)
South Korea (37)	0.146** (0.004)	0.175** (0.004)	0.258** (0.004)	0.023** (0.002)	0.049** (0.002)	0.086** (0.002)	0.002** (0.000)	0.006** (0.000)	0.006** (0.000)	0.007** (0.000)

Note: The closing stock prices on Wednesdays are taken to generate the weekly stock return, *Ret*. The daily share turnover is defined as trading shares divided by number of shares in issue. The weekly average share turnover, *st*, is calculated for a given week to avoid the different number of trading days in a week caused by the public holidays. The weekly return volatility is the standard deviation of the daily stock returns in a given week generated by the daily closing stock price. The dummies, ν_t , capture particular yearly trends, and λ_i is the firm-specific intercept. Spring, Fall and Winter are seasonal dummy variables which are set to be unity when the time is in the spring, all and winter respectively and zero otherwise. For the return regression, the *Jan* dummy is included to control the January effect; standard errors are given in the parentheses.

* Indicate significance at 10% levels; ** Indicate significance at 5% levels.

Table 5. Lunar Moon Festival Effect vs. Gong Fishin' Effect

Market	Share Turnover $\log st_{i,t} = \beta_1 * LMF_{i,t} + \beta_2 * GFX_{i,t} + \lambda_i + v_t + \varepsilon_{i,t}$			Return Volatility $\log Vol_{i,t} = \beta_1 * LMF_{i,t} + \beta_2 * GFX_{i,t} + \lambda_i + v_t + \varepsilon_{i,t}$			Stock Return $Ret_{i,t} = \beta_1 * LMF_{i,t} + \beta_2 * GFX + \beta_3 * Jan + \lambda_i + v_t + \varepsilon_{i,t}$			
	LMF	GFX	Equality test (H0: $\beta_1=\beta_2$)	LMF	GFX	Equality test (H0: $\beta_1=\beta_2$)	LMF	GFX	Jan	Equality test (H0: $\beta_1=\beta_2$)
Hong-Kong (22.15)	-0.061** (0.011)	-0.047** (0.005)	1.37 (0.242)	-0.022** (0.006)	-0.014** (0.003)	1.99 (0.159)	-0.000 (0.001)	-0.002** (0.000)	0.002** (0.001)	4.38 (0.036)
Taiwan (23.3)	-0.432** (0.009)	-0.256** (0.004)	368.73 (0.000)	-0.092** (0.005)	-0.005** (0.002)	248.28 (0.000)	-0.017** (0.001)	-0.007** (0.000)	0.016** (0.000)	282.67 (0.000)
China (35)	-0.263** (0.007)	-0.133** (0.003)	302.54 (0.000)	-0.095** 0.005	-0.045** (0.002)	108.79 (0.000)	-0.018** (0.000)	-0.000 (0.000)	0.001** (0.000)	1179.84 (0.000)
South Korea (37)	-0.240** (0.007)	-0.187** (0.003)	45.19 (0.000)	-0.163** (0.004)	-0.044** (0.002)	690.12 (0.000)	-0.008** (0.001)	-0.004** (0.000)	0.009** (0.004)	35.54 (0.000)
Panel Coef.	-0.232** (0.005)	-0.156** (0.002)	260.79 (0.000)	-0.102** (0.003)	-0.030** (0.001)	726.41 (0.000)	-0.010** (0.000)	-0.003** (0.000)	0.007** (0.000)	403.69 (0.000)

Note: The closing stock prices on Wednesdays are taken to generate the weekly stock return, *Ret*. The daily share turnover is defined as trading shares divided by number of shares in issue. The weekly average share turnover, *st*, is calculated for a given week to avoid the different number of trading days in a week caused by the public holidays. The weekly return volatility is the standard deviation of the daily stock returns in a given week generated by the daily closing stock price. The dummies, v_t , capture particular yearly trends, and λ_i is the firm-specific intercept; *LMF* is set to 1 for the two weeks including and following the LMF; *GFX* is set to one during all the summer weeks excluding the two LMF weeks. For the return regression, the *Jan* dummy is included to control the January effect. The values in the parentheses are the standard errors for the coefficients; * Indicate significance at 10% levels; ** Indicate significance at 5% levels; For the equality test, we report the F statistics and P value in the parentheses.

Table 6. Lunar Moon Festival Effect vs. Moon Phases Effect

Panel A: LMF Celebrated Markets (Group one)

Market	Share Turnover		Return Volatility		Stock Return		
	LMF	MP	LMF	MP	LMF	MP	Jan
Hong-Kong (22.15)	-0.051** (0.011)	0.008* (0.005)	-0.018** (0.006)	-0.005* (0.003)	0.001 (0.001)	-0.001** (0.000)	0.003** (0.001)
Taiwan (23.3)	-0.378** (0.009)	0.037** (0.004)	-0.097** (0.005)	0.036** (0.002)	-0.016** (0.001)	0.002** (0.000)	0.017** (0.000)
China (35)	-0.236** (0.007)	0.032** (0.003)	-0.090** 0.005	0.029** (0.002)	-0.018** (0.000)	-0.001** (0.000)	0.001** (0.000)
South Korea (37)	-0.197** (0.007)	0.009** (0.003)	-0.153** (0.004)	0.013** (0.002)	-0.007** (0.000)	-0.007** (0.000)	0.010** (0.000)
Panel Coef.	-0.199** (0.005)	0.018** (0.002)	-0.098** (0.003)	0.018** (0.001)	-0.009** (0.000)	-0.003** (0.000)	0.008** (0.000)

Panel B: Overseas Chinese dominated Markets (Group two) excluding Thailand

Market	Share Turnover		Return Volatility		Stock Return		
	LMF	MP	LMF	MP	LMF	MP	Jan
Indonesia (-5)	-0.156** (0.024)	0.015 (0.011)	0.059** (0.014)	-0.018** (0.006)	-0.013** (0.002)	-0.004** (0.001)	0.009** (0.001)
Malaysia (2.3)	-0.205** (0.010)	0.049** (0.004)	-0.000 (0.006)	-0.004 (0.003)	-0.008** (0.001)	0.008 (0.000)	0.008** (0.000)
Singapore (1.22)	-0.061** (0.012)	0.027** (0.005)	0.002 (0.007)	0.009 (0.003)	-0.003** (0.001)	0.001** (0.000)	0.004** (0.001)
Panel Coef.	-0.146** (0.008)	0.037** (0.003)	0.007 (0.109)	-0.001 (0.002)	-0.007** (0.000)	0.004** (0.000)	0.007** (0.000)

Note: We estimate the following panel regression model with share turnover, return volatility and stock returns used as the dependent variable: $Dep_{i,t} = \beta_1 * LMF_t + \beta_2 * MP_t + \lambda_i + \nu_t + \varepsilon_{i,t}$, where $Dep_{i,t}$ is the dependent variable;

LMF is set to 1 for the two weeks including and following the LMF; MP is set to be unity when the week includes a full moon and zero otherwise. The dummies, ν_t , capture particular yearly trends, and λ_i is the firm-specific intercept. For the return regression, the Jan dummy is included to control the January effect.

* Indicate significance at 10% levels; ** Indicate significance at 5% levels.