NEW EVIDENCE ON DAY OF THE WEEK EFFECT IN THE MALAYSIAN STOCK MARKET

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ABSTRACT

In this paper, we examine the day-of-the week effect using the daily closing prices of the Kuala Lumpur Stock Exchange Composite Index from January 1980 to December 1996. Our findings suggest that the day-of-the-week effects persist over time. The pattern of the effect is similar to that found in other countries with significant negative Monday returns and positive Friday returns. We also find evidence in the early periods that the Tuesday returns are more negative and Thursday returns are more positive. Secondly, the stock market crash of 1987 seems to result in empirical irregularity in the daily returns. Lastly, the negative Monday returns are consistently found when the market had declined the previous week.

INTRODUCTION

A considerable number of research has documented the existence of calendar or seasonal patterns in stock returns. In particular, it has been regularly observed that the early trading days of the week are characterised by low returns while the later days are characterised by high returns. For instance, in the case of the United States, negative returns are found for Monday and significant positive returns are found for Friday, (Lakonishok and Levi, 1982; Keim and Stambaugh, 1984; Linn and Lackwood, 1988; and Smirlock and Starts, 1988). Studies on other industrialised countries have also noted this empirical regularity, termed the-day-of-the-week effect, which exhibits negative returns in the early trading days, including Tuesday in certain cases (Theobal and Price, 1984; Jaffe and Westerfield, 1985; and Condoyanni et al. 1987).

For the Malaysian market, empirical analyses on the-day-of-the-week effect are limited. Analysing Malaysian market returns together with other markets over 1975-1988 and several sub-periods, Wong et al. (1992) noted that the day-of-the-week effect for Malaysian markets is similar to that in the US and Canadian markets. This means that the Malaysian market has negative mean returns on Monday and high positive returns on Thursday and Friday. More interestingly, they also noted some empirical

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irregularity in the pattern of the day-of-the week effect around the stock market crash of 1987 where Friday returns turned negative.

The analysis of Anuar and Shamsher (1993) substantiates the presence of the day-of-the week effect found by Wong et al. (1992). Yet, it might be noted that the findings of negative Monday returns are rather inconclusive. In the evaluation of the effect year by year, the majority of the Monday returns are negative. However, when they divided their sample into two subperiods, positive Monday returns were found for one period and negative returns for the other (see Table 3, p. 164). Using market data from 1990-1992, Omar Marashdeh (1994) concluded to the contrary, ie, there is no day-of-the-week effect in the Malaysian stock market in his sample.[1]

These findings need not be viewed as contradicting as they utilised different sample periods and data set. It could possibly mean that the Malaysian stock market has been increasingly informationally efficient. This may explain the absence of the effect in Omar's (1994) study, which uses the observations from a more recent period. Still, some doubts may be raised for two reasons. First, the analysis by Omar Marashdeh (1994) used a sample of only two and half years and his sensitivity analysis is based on splitting his already short sample to two sub-periods. Second, the conclusions obtained are based on different empirical approach - the non-parametric tests (Wong et al., 1992) and regression-based tests (Omar Marashdeh, 1994). Accordingly, the results may have arisen as a result of the methodology chosen. Based on these observations, further analysis on the issue seems warranted. Moreover, it may be also fruitful to focus on the changing pattern of the day-of-the-week effect found in early studies but which has received the least attention.

Thus in the present paper, we reevaluate the day-of-the-week effect in the Malaysian market. We seek to contribute to the empirical analyses of this seasonal anomaly in several important ways. First, we utilize the daily closing price of the Kuala Lumpur Stock Exchange Composite Index from January 2, 1980 to December 31, 1996. Thus, we extend the data sample to the most recent periods. The analysis by Wong et al. (1992) and Anuar and Shamsher (1993) cover the periods up to only May 1988 and December 1985 respectively. Meanwhile, the work of Omar Marashdeh is limited to 1990-1992. Then, we evaluate the sensitivity of the day-of-the-week effect to estimation periods. To address this issue, existing studies have generally examined the effect over non-overlapping sub-samples. In our analysis, we utilize instead the rolling regression approach which is widely applied in money-income link

[1] *The study by Annuar and Shamsher (1993) utilised the New Straits Times Industrial Index. Wong et al. (1992) and Marashdeh, however, used the Kuala Lumpur Stock Exchange's Index.*

literature. This, we believe, is a more rigorous robustness check on the issue. Additionally, we may also address the question as to whether the Malaysian market has become informationally efficient. Lastly, we also examine a recent twist on the Monday effect observed by Jaffe et al. (1989) and Agrawal and Tandon (1994), where the Monday returns are noted to be affected by the previous week's returns.

The organisation of the paper is as follows. In the next section, we briefly describe the data and methodology used. Section 3 presents and discusses the results, and section 4 concludes.

DATA AND METHODOLOGY

In order to examine the day-of-the-week effect in the Malaysian market, daily closing prices of the Kuala Lumpur Composite Index drawn from DATASTREAM are used. The data covers the period January 2, 1980 to December 31, 1996. The daily returns are calculated using the log-difference of the stock index, as follows,

$$r_t = \ln\left(\frac{P_t}{P_{t-1}}\right) \times 100 \qquad (1)$$

Where P is the closing price and r is the daily return. Note that the return is not adjusted for dividend yield. This is not uncommon even if the dividend is a component of stock returns, (See Yong, 1995 for a detailed explanation on the exclusion of dividend yield)

In the analysis, we employ the regression-based approach to test for the existence of the day-of-the-week effect. We estimate the following regression:

$$r_t = b_1 D_{1t} + b_2 D_{2t} + b_3 D_{3t} + b_4 D_{4t} + b_5 D_{5t} + \varepsilon_t \qquad (2)$$

D_{it} is a dummy variable representing the five trading days of the week; that is i = 1,...,5=Monday, Tuesday,...,and Friday, respectively. Since the trading day's returns after the holidays may confound the results of our analysis, a dummy variable is also introduced for the after-holiday returns as an additional explanatory variable in the regression. The null hypothesis is, there is no difference in the returns across the days of the week, which is tested using F statistics. The test values exceeding F critical values would indicate that the day-of-the-week effect is present in the Malaysian market. Furthermore, we also test the equality of any pair of the coefficients.

Additionally, we employ rolling regressions to examine whether the seasonal anomaly under considerations is period specific. We first estimate the model using the data from 1980-1984. Then, an

additional year of observations is added and the initial whole year of the data is dropped. This approach yields 13 sub-samples with a fixed rolling window of 5 years each. Estimating the model over these sub-samples, thus, we can examine the robustness of the day-of-the-week effect. Additionally, we may be able to observe whether the Malaysian stock market has become increasingly informationally efficient or has undergone structural changes in the pattern of the day-of-the-week effect.

Lastly, and independent of the above regressions, we also examine the twist in the day-of-the-week effect observed by Jaffe et al. (1989) and Agrawal and Tandon (1994). To this end, we follow the approach taken by Agrawal and Tandon (1994). The Monday returns are separated into two sub-samples based on the previous week's returns, negative or positive. Then, the difference in the mean of the two samples is tested.

RESULTS

3.1 Whole Sample: 1980-1996

Table 1 presents the day-of-the-week effects of the Malaysian market using the whole sample, Jan 1980-December 1996. Regression (1) is the mean returns estimated from equation (1) while regression (2) controls for the holiday return effect. The results, notably, are similar in both regressions. As may be observed from the table, the day-of-the-week effect is present in the Malaysian market. The F tests for the equality of the mean returns are rejected in both regressions at 1% level of significance. Individually, Monday is associated with significant and negative returns at 1% level in both regressions. Similarly, Tuesday is marked by negative returns and is marginally significant in one of the regressions. The later days, in contrast, have positive and significant returns at at least 5% level.

Table 1: The Day of the Week Effect -Whole Sample

Days	Regression (1)		Regression (2)	
Monday	-0.158	(3.250)*	-0.167	(3.421)*
Tuesday	-0.058	(1.221)	-0.070	(1.443)***
Wednesday	0.151	(3.152)*	0.145	(3.001)*
Thursday	0.159	(3.336)*	0.150	(3.133)*
Friday	0.116	(2.415)*	0.110	(2.286)**
Holiday	–	–	0.165	(1.695)**
F-tests	6.984*		7.117*	

Note: the numbers in parentheses are t statistics. *,**,*** denote significance at 1%, 5%, and 10% respectively.

Thus, our results are consistent with existing findings from the developed markets. Yet, to evaluate whether the returns between any pair of days are statistically different, we perform the F-tests for the equality of the two means based on regression (1). Table 2 presents the F-statistics. The results largely confirm the conclusion made from the regression that the day-of-the-week effect may be divided into two distinct periods: negative returns on Monday and Tuesday and positive returns on the other days. The returns on Monday and Tuesday are not statistically different from each other, while they are statistically different from the other three days. The same statement may be made for the other three days. Thus, our results support the existence of the day-of-the-week effect, substantiating the findings of Wong et al. (1992).

Table 2: F tests for the equality of two mean returns

Days	Tuesday	Wednesday	Thursday	Friday
Monday	1.0651	10.246*	10.838*	8.039*
Tuesday		4.792*	5.180*	3.308**
Wednesday			0.006	0.137
Thursday				0.203

Note:*,**, and *** denote significance at 1%, 5%, and 10% respectively

3.2 Recursive Regression

It might be argued that the pattern of the seasonal anomaly changes over time. For example, the stock market itself may become more informationally efficient and thus the day-of-the-week effect may disappear over the years. The structural changes of the financial sector over time may also induce a different pattern of the day-of-the-week effect. In short, the results on the effect may be period specific. To examine this contention, we perform rolling regressions of equation (1) using a fixed window of 5 years. As described above, the approach yields 13 sub-samples. The results of the rolling regressions are summarised in Table 3.

Table 3: The Day of the Week Effect - Recursive Regressions

Samples	Mon	Tue	Wed	Thur	Fri	F-tests
1980-1984	-0.1559	-0.1994	0.1776	0.1616	0.1655	4.2540*
	(1.8652)**	(2.4260)*	(2.1600)**	(1.9781)**	(2.0137)**	
1981-1985	-0.2175	-0.2583	0.0962	0.1480	0.0332	3.7489*
	(2.5090)*	(2.9925)*	(1.1281)	(1.7466)**	(0.3860)	
1982-1986	-0.2161	-0.1145	0.0792	0.1361	-0.0599	2.5766**
	(2.6853)*	(-1.4222)***	(0.9960)	(1.7256)*	(0.7447)	
1983-1987	-0.1756	-0.1671	0.0628	0.3068	-0.0786	3.1299**
	(1.7145)**	(1.6214)***	(0.6149)	(3.0269)*	(0.7564)	
1984-1988	-0.1745	-0.1528	0.0940	0.2929	-0.1287	2.9782**
	(1.6447)***	(-1.4432)***	(0.8955)	(2.8125)*	(1.2129)	
1985-1989	-0.1562-	-0.0562	0.1469	0.3438	-0.0243	2.6316**
	(1.4231)***	(0.5172)	(1.3552)***	(3.1852)*	(0.2223)	
1986-1990	-0.1256	-0.0009	0.2141	0.2319	0.0186	1.5760
	(1.1444)	(0.0084)	(1.9763)**	(2.1626)**	(0.1712)	
1987-1991	-0.1369	-0.0136	0.1383	0.2448	0.0906	1.5579
	(1.2988)	(0.1301)	(1.3150)***	(2.3660)**	(0.8652)	
1988-1992	-0.0787	0.0639	0.1405	0.1492	0.0873	1.1353
	(1.0138)	(0.8394)	(1.8411)**	(1.9788)	(1.1530)	
1989-1993	-0.0781	0.0952	0.1523	0.1483	0.1929	1.6708***
	(1.0524)	(1.3035)***	(2.0864)**	(2.0389)**	(2.6480)*	
1990-1994	-0.1423	0.0398	0.1599	-0.0139	0.1689	2.0652**
	(1.7599)**	(0.4965)	(1.9855)**	(0.1757)	(2.1150)**	
1991-1995	-0.2261	0.0383	0.1931	0.0516	0.2145	4.1258*
	(2.9063)*	(0.4999)	(2.4866)*	(0.6775)	(2.8132)*	
1992-1996	-0.1957	0.0371	0.2091	0.0400	0.2258	4.2218*
	(2.6175)*	(0.5119)	(2.8315)*	(0.5489)	(3.1062)*	

Note: The numbers in parentheses are statistics. *,**, and *** denote significance at 1%, 5%, and 10% respectively.

From the results, we note the existence of the day-of-the-week effect for ten of the rolling samples. The results we obtain are not inconsistent with both Wong et al. (1992) and Omar Marashdeh (1994). For the rolling samples up to 1988, the F-statistics are significant at at least 5% level, indicating the presence of the day-of-the-week effect. However, for the rolling samples that start in 1986 and end in 1992 (5 samples), the F-statistics become insignificant. It seems that extending the observations to include late 1980s and early 1990s results in the absence of the weekend effect. However, including even more recent observations than that of Omar Marashdeh (1992), we find that the day-of-the-week effect re-emerges. That the stock market becomes more informationally efficient over time therefore does not seem to be an explanation. Since the insignificant F statistics are found in the samples that center around 1987 (1986-1992), we tend to agree with Wong et al. (1992) that the stock market crash of 1987 may be an explanation.

Looking at the day returns, we note some interesting patterns in the day-of-the-week effect for the Malaysian market. First, the Monday returns are always negative, corroborating the findings reported previously. Yet, we find the returns to be insignificant in four rolling samples that center around 1987 (1986-1993). Again, the events around the stock market crash may be a source of this empirical irregularity.

Second, the Tuesday returns have changed over the years. In the first five rolling samples (1980-1988), they are found to be negative and significant. The magnitude of the returns even dominate the Monday returns in the first two samples. Although the Tuesday returns remain negative, they turn insignificant in the next three rolling samples (1985-1991). Lastly, they become positive for the final five rolling samples (1988-1996). Still, save one, they remain insignificant.

The findings of Monday and Tuesday returns have important implications for the spillover hypothesis put forward in some studies. In particular, the hypothesis suggests that the negative returns on Tuesday may be caused by the negative Monday returns of the United States (Jaffe and Westerfield, 1985). Since trading in the two markets are twelve hours apart, there may be a spillover from the U.S market to the Malaysian market. Thus, we should observe negative returns for Tuesday. Our results, however, do not support this hypothesis.

Lastly, with some exceptions, the later trading days, Wednesday, Thursday, and Friday are characterised by positive returns. The exceptions are the Friday returns for four rolling samples (1982-1989) and one Thursday returns (1990-1994). The Wednesday returns are consistently positive. The Thursday

returns dominate in both magnitude and significance in early rolling samples. However, the Friday returns become dominant for the 1990s.

In summary, consistent with existing findings, we conclude that the day-of-the-week effect is present in the Malaysian market. Yet, the pattern of the effects has changed over time from negative Tuesday - positive Thursday to negative Monday - positive Friday. Additionally, consistent with Wong et al. (1992), the observations around the market crash of 1987 have created irregularity in the daily returns.

3.3 Twist on the Monday Effect

One twist on the Monday effect is that the Monday returns are negative if the market declines the previous week. Looking at five industrialised countries, Jaffe et al. (1989) found that the low Monday returns seem to follow the decline in the market. Recently, Agrawal and Tandon (1994) examined this twist for 18 countries. Similarly, they reported strong evidence that the Monday returns are negative when the previous week's returns are also negative.

To examine the twist in the Monday effect for the Malaysian market, we follow the approach taken by Agrawal and Tandon (1994). We separate the Monday returns into two sub-samples depending on the previous week's market performance whether positive or negative. The significance and equality of the returns of the two sub-samples are then evaluated. Table 4 reports the results for the whole sample and the 13 rolling samples.

Table 4: The Twist on the Monday Effect

Samples	Previous Week Returns		F tests for Mean Equality
	Negative	Positive	
Whole Samples			
1980-1996	-0.6163 (7.3030)*	0.1653 (2.3399)**	25.207*
Rolling Samples			
1980-1984	-0.7769 (5.6339)*	0.2745 (2.3995)*	17.216*
1981-1985	-0.6709 (5.3396)*	0.1709 (1.4613)***	12.025*
1982-1986	-0.6343 (5.8083)*	0.2308 (2.0273)**	15.035*
1983-1987	-0.6359 (4.0865)*	0.2284 (1.5487)**	8.127*
1984-1988	-0.5626 (3.3939)*	0.1854 (1.1524)	5.242*
1985-1989	-0.5651 (2.7673)*	0.0985 (0.5865)	3.149**
1986-1990	-0.5711 (2.5495)*	0.1327 (0.7560)	3.067**
1987-1991	-0.5331 (2.3825)*	0.0740 (0.4385)	2.346***
1988-1992	-0.3139 (1.7873)**	0.0533 (0.3911)	1.365
1989-1993	-0.3549 (2.1323)**	0.0706 (0.5690)	2.099
1990-1994	-0.5520 (3.9411)*	0.1443 (1.2447)	7.334*
1991-1995	-0.6705 (5.5960)*	0.1019 (1.0253)	12.309*
1992-1996	-0.5916 (5.3607)*	0.0863 (0.9667)	11.401*

Note: the numbers in parentheses are t statistics. *,**, and *** denote significance at 1%, 5%, and 10% respectively.

As may be noted from the table, the evidence on the twist on the Monday effect is overwhelming. The Monday returns are consistently negative and significantly different from zero, in the whole sample and all rolling samples, when the market is down in the previous week. When the market rises, however, the Monday returns are positive. In terms of significance, the positive Monday returns following the up market are significant in the whole sample and in only early rolling samples. The F tests, furthermore, largely reject the null hypothesis that the two returns are equal in all but two rolling samples. Thus, it seems that the documented negative returns found previously are driven by the market performance of the previous week. Although, the theoretical explanation for this twist is yet forthcoming, the generality of this effect has been found in yet another market.

CONCLUSION

In this paper, we evaluate the day-of-the-week effect for the Malaysian stock market using the data that extends to the most recent periods, up to December 1996. Consistent with existing findings, our results largely document the presence of the day-of-the-week effect. In particular, the negative Monday returns are found to be persistent. The later trading days, meanwhile, are characterised by positive returns with a changing pattern from Thursday effect to Friday effect. The persistence of Monday effect together with the disappearance of the Tuesday effect in later periods rules out return spillover from the United States to Malaysia, a notion that has been put forth by Jaffe and Westerfield (1985). Adding the empirical anomalies of the financial markets, we also find the Monday returns seem to follow the perfomance of the market in the previous week. Namely, a down market is followed by negative Monday returns and an up market is followed by positive Monday returns. These findings are robust across estimation ranges.

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