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THE ROLE OF HERD BEHAVIOUR IN DETERMINING THE INVESTOR'S MONDAY IRRATIONALITY

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ABSTRACT

With regards to determining whether herding is spontaneous and irrational behaviour causing the Day-of-the-week anomaly, this paper intersects the Christie and Huang (1995) herd behaviour model with French's (1980) Day-of-the-week model in several layers of tests. We use firm-level data and investigate the return dispersion of 846 Bursa Malaysia stocks during 1990–2010. This paper found the herd behaviour is the determinant for investor's Monday irrationality, especially in small caps industry.

Keywords: herding, day-of-the-week anomaly, Malaysian listed companies

INTRODUCTION

A basic tenet of traditional economics is that investment decisions reflect rational expectation. In this assumption, decision-making utilises all available information in an efficient manner. Conversely, behavioural group nominates psychology factors as the driver in investment. For example, they counters the rational behaviour assumption by introducing the investor′s Monday irrationality or known as the Monday irrationality.

Generally, Monday irrationality is defined as an anomalous event in the stock market where the returns of a certain day are significantly different from other day returns. There is no supported information in making the price, but it just sways away from the normal distribution (see Dimson & Mussavian, 1998; Malkiel, 2003). This shows the violation of the rational behaviour assumption of traditional finance. Much research on it gauges investor behaviour as the explanation for the anomalous conditions in the market (see Abraham & Ikenberry, 1994; Clare, Psaradakis, & Thomas, 1995; Berument & Kiymaz, 2001; Wong, Agarwal, & Wong, 2006). In the conclusion and limitation sections

of those research papers, it suggested to investigate further the role of investor behaviour in Monday irrationality. Interestingly, examining the Monday irrationality from the psychology point of view empirically is rare.

The aim of this paper is to investigate the link between herd behaviour and Monday irrationality. In other words, we aim to develop a clearer understanding of some forces that can lead to the irrationality by proposing herd behaviour as the determinant force. Our model is based on two seminal and established models. In terms of Monday irrationality, we employ French′s (1980) model. Meanwhile, for herd behaviour, we utilise the Christie and Huang (1995) approach. Details of the procedures and measurements are described in Methodology section.

This paper has two important contributions. First, it contributes to the body of knowledge. So far, there is no empirical explanation on the Monday irrationality from trading behaviour context. Our research advises empirically herd behaviour as the explanation by conducting the four-layer test. This research bridges the gap between traditional finance and its contender by using the behavioural approach. Moreover, it recommends that the efficiency in the market actually can be achieved as long as there is no psychological bias in the investor trading behaviour. Second, it caters for the implication to practitioners. By revealing the fear and regret aversion of the individual investor during Monday, sophisticated investor can be the market maker by controlling the psychology of other investors through cognitive dissonance during the calendar anomaly.

The herding behaviour subject in this research is Malaysia stock market. It has US$189 billion market capitalisation which is dominated by Trade and Service, Finance, Industrial, Plantation and Consumer Products Industries. For example, the five highest capitalisation stocks of the market are from those five biggest caps industries such as CIMB Bank (Finance), Maybank (Finance), Sime Darby (Plantation and Property), Petronas Chemicals (Industrial) and Genting (Trading and Service). The small caps industries in Bursa Malaysia are Hotel/Leisure Industry, Mining Industry and Technology Industry.

These points are further developed in the four sections following this one. The next section presents the literature review, structure and theoretical model. The research proposition is also included in end of the literature review section. The next section describes the methodology and data. Then, the next section elaborates on the literature and our findings. The final section contains the concluding remarks.

LITERATURE REVIEW

Monday Irrationality; also known as *Day-of-the-week Anomaly* is a phenomenon where the returns of a certain day disperse significantly compared to other days. It is perceived as a form of irrational behaviour of investors. Trading behaviour is introduced as the explanation of this anomaly.

The variability of equity returns on Monday can be explained as a spontaneous and irrational behaviour. It is in line with the argument in herd behaviour. In rational asset pricing context, herd behaviour reflects more on the irrational response of investor than the outcome of rational decision making because it implies that prices may be driven away from their equilibrium value. Literature shows the dispersion from the rational asset pricing is caused by cognition of investor in self-satisfaction. In psychology, this behaviour is more known as cognitive dissonance and regret aversion.

To reduce the pain psychologically, investor usually adjusts their feeling about the success of historical investment choice by remembering their stock past performance as better than in the reality. Goetzmann and Peles (1996) conducted a research regarding the cognitive dissonance of investor by survey. They found that most of the people tend to do the cognitive dissonance to please them. Akerlof and Dickens (1982), who examined the relationship between cognitive dissonance and economic consequences, found the changes in belief and cognitive dissonance towards economic consequences due to modernisation. In finance, this cognitive dissonance can be caught in herd behaviour (see Devenow & Welch, 1996).

Herd behaviour means an event that under certain conditions most of the investors focus only on a subset of securities by flocking, while neglects other securities with identical exogenous characteristics (Hirshleifer, Subrahmanyam, & Titman, 1994). In a simple relationship, the herd behaviour is related to the social psychology which called regret aversion and cognitive dissonance. The experimental and empirical evidence show individual in groups abides the group decision, even when they perceive the group to be wrong. Individual suppresses their own beliefs and relies on their investment decision solely on the collective action, even though they disagree with the prediction. The reason is that individual avoids being regret if the group is found to be true. Another reason is to satisfy their judgment if the judgment is found to be wrong in the future. It is better to have mistakes in a group rather in personal. This is what they called as regret aversion and cognitive dissonance; or in finance it called as herd behaviour.

Academic literature includes many models of herd behaviour in the financial market. Shiller and Pound (1989) documented survey evidence on herding among the institutional investors. They found that institutional investor place significant weight on the advice of other professionals on their buy and sell decisions in volatile stocks. Scharfstein and Stein (1990) proposed the herding model of manager ignorance on their own information because of their regret aversion. Froot, Scharfstein and Stein (1992) confirmed that speculators with short horizons might herd on the same information. Welch (2000) explained how sequential issues of IPOs could lead investors to ignore their private information and herd on the decision of earlier investors. Lakonishok, Shleifer, and Vishny (1994) found only weak evidence of herding decision by institutional investors among small stocks and no evidence of herding among large stocks. Trueman (1994) showed that individual investor might herd toward the report issued by other analysts. Nofsinger and Sias (1999) found institutional investors positive-feedback trade more than individual investors and institutional herding impacts prices more than herding by individual investors.

More topical herd behaviour model is the model of Christie and Huang (1995). It is based on the dispersion of firm returns from the market normal distribution return. Christie and Huang (1995) model is popular for their explanation of herding in anomalous condition of market such as market stress. Other seminal papers such as Chang, Chen and Khorana (2000), and Gleason, Lee and Mathur (2000) also followed the Christie and Huang (1995) model. This research also replicated the Christie and Huang (1995) model.

Much empirical studies have documented the evidence of herd behaviour. Chen, Rui and Xu (2003) found the herd behaviour in Chinese Stock Market. It is aligned with Chang et al. (2000) and Hwang and Salmon (2004). Chang et al. (2000) found the relationship between herding and high return dispersion in U.S., Hong Kong, Japan, Korea and Taiwan. Meanwhile, Hwang and Salmon (2004) found that developed market such as U.S. and U.K. exhibit less herding behaviour than emerging market such as Korea. They address the information asymmetry as the case of this condition.

In the Malaysia context, this herd behaviour was also found. For instance, Kaminsky and Schmukler (1999) addressed herd behaviour as the reason chaotic financial environment in Malaysia during 1997 crisis because of the herding of the bad news from neighbours countries. In line with Kaminsky and Schmukler (1999), Glick (2007) also found the herd behaviour during the financial reforms in Malaysia. For the stock market case, Wong and Kok (2009) found the herding in bursa Malaysia. This paper also employed Christie and Huang (1995) model. Toh and Hooy (2010) also employed the same model and fell in the same conclusion. They found investor followed other investor, cross sectionally, in

their trading decision. More topical, Chiang and Zheng (2010) documented also the herd behaviour in bursa Malaysia.

Herd behaviour is also about timing trading behaviour (see Cipriani & Guarino, 2005). This is consistent with the presumption in Monday irrationality research such as Lakonishok and Maberly (1990), Kamara (1997), and Wong et al. (2006), where it documented the dossiers of irregularities of institutional and individual trading during Monday due to herding behaviour. Kamara (1997) investigated U.S. market, and found trading cost and institution herding are the reasons for the day-of-the-week anomaly. Wong et al. (2006) surmised that the seasonality awareness might notice the investor to follow the market. This awareness can be seen as the contagion effect as mentioned by Halim, Brahmana and Herwany (2011), and Brahmana and Asmar (2011).

We used Ellis′ Activating events – Belief-Consequence (1950) as the theoretical framework of this research. The flow is that investor stimulated by the investor lack of information in making the investment decisions. Having this stimulant, investor experiences the cognitive dissonance and does herd behaviour to reason the decision and to avoid regret. As the consequence, it strokes the day by generating Monday irrationality. Figure 1 confirms our hypothesis to be logic and reasonable. Based on this literature review, our proposition is "herding is the determinant of Malaysian day-of-week anomaly".

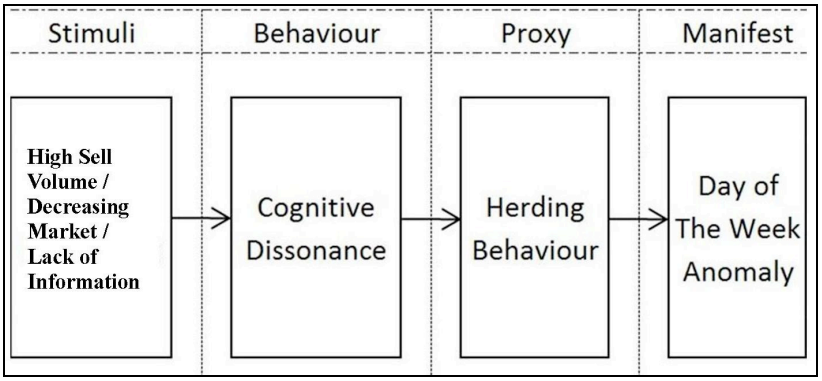

Figure 1. Theoretical framework

METHODOLOGY

Data

We used daily price from Thomson Reuters Data Stream. The sample comprises the 846 listed firms in Bursa Malaysia from 1 January 1990 until 31 December 2010. This research has two different daily returns. First, the returns that used in testing the daily basis herd behaviour are the common returns' formula which is the logarithm of today returns divided by yesterday returns. Meanwhile, the daily returns in the robustness check are calculated by the normal logarithm of the closing price per the opening price of the day. The detail procedure is described in next section.

Measurement

Our objective is to test the role of herd behaviour in determining the day-of-the week anomaly. It is noteworthy that testing this relationship has to construct the herd behaviour model first. It is based on the Christie and Huang (1995) model where it has to assemble the dispersion measurement. Because investors are more likely to suppress their own belief in favour of the market consensus during periods of unusual market movements, herd behaviour would most likely emerge during periods of market anomalies such as Monday irrationality. By following Christie and Huang (1995) methodology justification, the trading interval is assumed characterised by large swings in average prices.

Christie and Huang's (1995) equation is built on the rational asset-pricing model. The dispersion from this underlying model rational asset-pricing model indicates the herd behaviour. The logic is that during the anomalous condition, rational asset pricing models predict that large changes in the distribution of market returns would translate into an increase in the dispersion. It is because of the firm returns which hold by investors differ in their sensitivity to the market returns (Christie & Huang, 1995). In other words, the tails of the normal distribution of market returns by the firms' returns indicate the herding behaviour. Interestingly, Christie and Huang's (1995) model is very suitable with our case as Monday irrationality is also an anomalous condition in the market.

Building the herding measurement, this research has to measure the dispersion first. The dispersion is estimated by the following expression:

$$S = \sqrt{\frac{\sum_{i=1}^{n} (r_i - \bar{r})^2}{n-1}} \tag{1}$$

where r_i is the observed return of firm i and $\bar{r}$ is the cross-sectional average of the n returns in the portfolio. This measure can be regarded as a proxy to individual security return dispersion around the market average. As mentioned earlier, the main idea in this methodology is the presence of herding would lead security return not to deviate far from the overall market returns.

Daily returns

As this study caters for the Monday irrationality, it is important to construct a robust proxy of daily returns. This paper did not take the common use return calculation where the current price is divided by lagged-one price in normal logarithm. If we did this, the returns would be the weekly returns and did not depict the true returns of the day return. It will result in a bias conclusion. Therefore, we tackled the issue by obtaining the opening price and closing price as the measurement of returns. The formula is as follows:

$$R_{D,t} = Log\left(CP_t \Big/ OP_t\right) \tag{2}$$

where $R_{D,t}$ is the return on certain day at period t, CP_t is the certain day closing price at period t, at OP_t is the certain opening price at period t.

Herding model

Christie and Huang (1995) suggest that the presence of herding is most likely to occur during the periods of extreme movements, as they would most likely tend to go with the market consensus during such periods. Hence, we examine the dispersion behaviour of Christie and Huang (1995) linear regression:

$$SD_t = \alpha + \beta_1 D_t^L + \beta_2 D_t^U + \varepsilon_t \tag{3}$$

where D_t^L is equal to 1, if the return on the aggregate market portfolio on day t lies in the 5% lower tail of returns distribution; 0 otherwise, and D_t^U is equal to 1, if the return on the aggregate market portfolio on day t lies in the 5% upper tail of return distribution; 0 otherwise. The dummy variables aim to capture differences in return dispersion during periods of extreme market movement. If it is significant and negative in upper bound, there is herd behaviour during upturn market. Meanwhile, if the result is significant and negative in lower bound there is herd behaviour during market downturn. As herd formation indicates

conformity with market consensus, the presence of negative and statistically significant of the beta coefficient (β_1 and β_2) would indicate herd formation by investors.

Day-of-the-week anomaly model

The day-of-the-week anomaly or Monday irrationality of this research was constructed under the French's (1980) model. This model is very commonly used model in calendar anomaly research. It is based on event study and market model equation where the formula uses the dummy to show the anomalous condition in certain day. This model is robust because it eliminates the Monday dummy to avoid the dummy trap. According to Gujarati and Porter (2009), if there are more than three dummies; intercept can be use as the explanation as far as there are no other variable dimensions. In addition, we put the one-lagged return to eliminate the variance errors. The model is:

$$R_t = \alpha + \gamma_1 d_{Tue,t} + \gamma_2 d_{Wed,t} + \gamma_3 d_{Thu,t} + \gamma_4 d_{Fri,t} + \gamma_5 R_{t-1} + \varepsilon_t \quad (4)$$

where R_t is Return of the stock at t-time; $d_{Tue,t}$, $d_{Wed,t}$, $d_{Thu,t}$, $d_{Fri,t}$ are Tuesday dummy, Wednesday dummy, Thursday dummy and Friday dummy, respectively.

Procedures

This research conducts what we called as four-layer test to investigate the link between herding and Investor's Monday irrationality. First layer was to investigate the dossier of the Monday irrationality in Malaysian stock market. This is a very important step. If there is no evidence of it in the market, it will be no point to conduct this research. After finding the presence of Monday irrationality in the Malaysian stock market, we continued to investigate the herd behaviour in the market by using the whole trading days (full sample). This procedure was conducted to examine the existence of the herd behaviour in the market day by day. Note that our research aims to investigate whether the herd behaviour causes the Monday irrationality. If there was herd behaviour in this full sample, the herd did not stroke the Monday irrationality but the market.

Then the third layer was to investigate the herd behaviour in daily basis. This is important because it reveals the existence of herd behaviour only on Monday. Following Christie and Huang (1995) model, the industries which found negative and significant in our regression result is remarked as the herd formation.

In a brief, our four layers test is:

1. Investigate the existence of Monday irrationality in the Market, with the expectation that Monday irrationality is documented and does not disappear.
2. Investigate the herd formation in the Market (full sample), with the expectation it was not documented in the market.
3. Investigate the herd formation day-by-day, with the expectation that herd behaviour occurs only in Monday.
4. Investigate the evidence of Monday irrationality in the Industry, with the expectation that the Monday irrationality in the Industry is documented. The last test is just to confirm the existence of Monday irrationality in industrial base.

DISCUSSION

Malaysian Stock Market Day-of-The-Week Anomaly

Mentioned in our research objective, we aim to examine the role of herding on Monday irrationality. Therefore, it is important to prove the existence of the anomaly by following the classic work of French (1980). We also examined the degree of the disappearing Monday irrationality in regards of conferring the irrationality has not diminished trailing the development of the market. This research follows Wong et al. (2006) procedures by breaking the period into three sub-periods. If the Monday irrationality still exists in these three sub-periods, it indicates the Monday irrationality does not disappear.

Table 1 reveals a weekly pattern of stock returns, including the result of French (1980) models. The coefficient of Monday returns was negative in the full period as well as in the other two sub-periods. Additionally, the negative returns on Monday had increased into positive returns and diminish again when it closed to Friday. The result of regression documented the day-of-the-week anomaly in Malaysian stock market. The coefficient of the model, which is the proxy of Monday irrationality, was found significant in 1% level. These findings confirm the evidence of weekend effect in Malaysian over the long period of 1990 to 2010. Then, we examined the disappearance of Monday irrationality by looking into the sub-periods results[1].

The result supports that there is no disappearance of Monday irrationality; implying that investors might generate abnormal returns and might have been irrational. As the Monday irrationality did not disappear, we can proceed to the

next procedure to test the existence of the herd behaviour. Note that this first layer of test allowed us to empirically indicate the evidence of irrational behaviour. We believe that the irrationality behind the Monday irrationality is determined by the cognitive dissonance of investors. The investor needs rationalisation and regret aversion in making decision to loosen the psychology weight if the decision found to be wrong. Therefore, we run the herd behaviour model.

Table 1
The result of Malaysian Stock Market Monday irrationality

Period	Monday	Tuesday	Wednesday	Thursday	Friday
1990–2010	–0.0014**	0.0023 ***	0.0018**	0.0022**	0.0020**
	(0.018)	(0.000)	(0.021)	(0.022)	(0.040)
1990–2000	–0.0014***	0.0027***	0.0021***	0.0022***	0.0019***
	(0.000)	(0.000)	(0.000)	(0.006)	(0.000)
2000–2010	–0.0020***	0.0028***	0.0025***	0.0033***	0.0043***
	(0.005)	(0.005)	(0.006)	(0.005)	(0.000)

Note: Figure stated is the coefficient and the probability values (inside the parentheses). "**", and "***" denote 5%, and 1% statistically significance. The formula was adopted from French (1980): $R_t = \alpha + \gamma_1 d_{Tue,t} + \gamma_2 d_{Wed,t} + \gamma_3 d_{Thu,t} + \gamma_4 d_{Fri,t} + \gamma_5 dR_{t-1} + \varepsilon_t$

Herd Behaviour in Malaysia Stock Market

After running the Christie and Huang's (1995) model, our results are consistent with prior research (Chen et al., 2003) in the sense that we did not find any evidence in favour of herd formation. Table 2 also provides the result of regression estimation of Model (3) where we already categorised the stocks in the 10 sector listed in Bursa Malaysia (formerly known as Kuala Lumpur Stock Exchange). It shows the cross-sectional standard deviation of stock returns for the entire sample.

Similar to the analysis of Christie and Huang (1995), we used 5% criteria to restrict the variables D_t^L and D_t^u to 5% of the lower (upper) tail of the market return distribution. The upper bound is to examine the market upswing, and lower bound dummy is to examine the market downswing. Our results show no evidence of herd formation in any industry of Malaysian Stock market.

Table 2 reports all of industries upper bound (b1) coefficients and lower bound (b2) coefficients are positive, which is contrary with Christie and Huang (1995) hypothesis. This result is consistent with the findings of Chang et al. (2000), Gleason et al. (2000), Chen et al. (2003), that herding behaviour does not

exist in the financial markets. This result supports to the basic tenet of traditional finance theories that investors are rationally behaved in decision making through the week. Somehow, this result supports our hypothesis which: the herd behaviour does not occur in Malaysian stock market in the full sample mode.

According to calendar anomaly hypothesis, taking the whole sample of trading days will not reveal the real situation of market behaviour in detail. It suggests investigating the behaviour of trading day in detail day-by-day. Therefore, we continued our research to third layer test to examine the driver of trading day behaviour.

Table 2
The herd behaviour in Malaysia stock market

	Construction	Consumer Products	Finance	Hotel	Industrial Industry	Mining	Plantation	Property	Trading and Service	Technology
α_{market}	2.788***	2.823***	2.25***	1.691***	3.168***	1.329***	2.139***	2.964***	2.909***	2.27***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
b1	1.567***	0.800***	1.012***	1.715***	0.884***	2.012***	1.561***	1.046***	0.969***	0.525***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
b2	1.138***	0.517***	0.85***	0.644***	0.287***	1.498***	0.81***	0.235**	0.434*	0.234***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.008)	(0.000)	(0.000)	(0.014)	(0.000)	(0.094)

Note: Figure stated is the coefficient and the probability values (inside the parentheses). *, **, and *** denote 10%, 5%, and 1% statistically significance. Herd behaviour is when both of the Upper bound (b1) and Lower bound (2) are negatively significant. It was run under Christie and Huang (1995) model:

$$SD_t = \alpha + \beta_1 D_t^L + \beta_2 D_t^U + \varepsilon_t$$

Herding on Monday

The evidence of no herd behaviour in the whole trading days let us to test calendar anomaly hypothesis by proceeding to Monday returns data[2]. Table 3 provides the regression estimate for Model (3) of the 10 sector listed in Bursa Malaysia. We rerun again the analysis of Christie and Huang (1995). Our results show that there was a herd formation in industrial levels but only on small caps industries such as Hotel, Mining and Technology[3]. This result is consistent with the findings of Chang et al. (2000).

Then, we surmise that the herd behaviour is the driver for the Monday irrationality. It means the cognitive dissonance of the investors play a role in decision making on Monday. This decision making is based on *share the blame* paradigm and weight the Monday trading. As we found Monday irrationality in the first layer, and no herd behaviour in the market, we remark the third layer test as an evidence of the relationship between Monday irrationality and herd behaviour.

Table 3
The herd behaviour in Malaysia stock market day-by-day

Sector	Monday			Tuesday			Wednesday			Thursday			Friday		
	α_{monday}	b_1	b_2	$\alpha_{tuesday}$	b_1	b_2	$\alpha_{wednesday}$	b_1	b_2	$\alpha_{thursday}$	b_1	b_2	α_{friday}	b_1	b_2
Construction	3.095***	0.592***	0.114	3.055***	0.599***	-0.125	3.221***	0.099	-0.341*	3.093***	0.345*	-0.152	3.115***	0.127	-0.408**
	(0.000)	(0.003)	(0.460)	(0.000)	(0.000)	(0.385)	(0.000)	(0.644)	(0.073)	(0.000)	(0.077)	(0.377)	(0.000)	(0.425)	(0.017)
Consumer Products	2.596***	0.788***	0.381***	2.704***	0.508***	0.132	2.781***	0.149	-0.004	2.615***	0.379***	0.20*	2.821***	0.132	-0.109***
	(0.000)	(0.000)	(0.003)	(0.000)	(0.005)	(0.390)	(0.000)	(0.301)	(0.978)	(0.000)	(0.003)	(0.086)	(0.000)	(0.501)	(0.003)
Finance	2.293***	0.572***	0.005	2.348***	0.268**	-0.05	2.269***	0.353***	-0.007	2.224***	0.343***	-0.112	2.242***	0.201**	-0.122
	(0.000)	(0.000)	(0.967)	(0.000)	(0.043)	(0.656)	(0.000)	(0.005)	(0.955)	(0.000)	(0.002)	(0.258)	(0.000)	(0.032)	(0.223)
Hotel	2.544***	-0.437***	-1.369***	2.424***	0.094***	-0.151***	2.398***	0.148***	0.396***	2.286***	0.929***	0.114***	2.443***	0.168***	-0.437***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Industrial Industry	2.762***	0.694***	0.513***	3.055***	0.599***	-0.125	2.929***	0.660***	0.137	2.812***	0.530***	0.455***	2.901***	0.381***	0.183
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.385)	(0.000)	(0.000)	(0.222)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.143)
Mining	2.427***	-0.607***	-1.475***	2.317***	0.560***	-0.623***	2.498***	-0.81***	0.754***	2.412***	0.699***	0.71***	2.408***	0.599***	0.840***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Plantation	2.252***	0.515***	-0.031*	2.298***	0.350***	-0.141	2.296***	0.161	-0.161	2.215***	0.159	-0.06	2.234***	0.113	-0.390***
	(0.000)	(0.000)	(0.080)	(0.000)	(0.008)	(0.227)	(0.000)	(0.218)	(0.171)	(0.000)	(0.210)	(0.593)	(0.000)	(0.288)	(0.000)
Property	2.707***	0.097***	0.246**	2.812***	0.601***	0.008	2.694***	0.721	0.107	2.686***	0.553***	0.145	2.664***	0.527***	0.094
	(0.000)	(0.000)	(0.017)	(0.000)	(0.000)	(0.936)	(0.000)	(0.000)	(0.239)	(0.000)	(0.000)	(0.167)	(0.000)	(0.000)	(0.386)
Trading and Service	2.663***	0.079***	0.359***	2.700***	0.587***	0.178**	2.689***	0.599***	0.305***	2.627***	0.637***	0.242**	2.713***	0.350***	0.103
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.084)	(0.000)	(0.000)	(0.005)	(0.000)	(0.000)	(0.012)	(0.000)	(0.001)	(0.386)
Technology	2.469***	-0.321*	-0.464***	2.355***	-0.247	0.511***	2.381***	-0.247*	0.573***	2.336***	0.382**	0.560***	2.326***	0.374**	0.740***
	(0.000)	(0.064)	(0.001)	(0.000)	(0.129)	(0.000)	(0.000)	(0.089)	(0.000)	(0.000)	(0.012)	(0.000)	(0.000)	(0.021)	(0.000)

Note: Figure stated is the coefficient and the probability values (inside the parentheses). *, **, and *** denote 10%, 5%, and 1% statistically significance. Herd behaviour is when both of the upper bound (b1) and lower bound (2) are negatively significant. It was run under Christie and Huang (1995) model: $SD_t = \alpha + \beta_1 D_t^L + \beta_2 D_t^U + \varepsilon_t$

Furthermore, this result implies that investors are not rational and does not invest merely based on fundamental information. Practically, investors tend to mimic actions of other investors and make investment decisions based on hearsay rather than rigour analysis because of the cognitive dissonance (Scharfstein & Sten, 1990). In a nutshell, the herd behaviour determined the Monday trading behaviour.

Robustness Check

In terms of robustness check, let us look at the results of the herd behaviour in day by day. Previously, we showed that there is no herd behaviour on the market through the week. However, we found the herd behaviour on three industries (small caps Industries) during Monday. This research cannot directly remark that herd behaviour drives the day-of-the week anomaly if it has not proven on other days. Hence, it is logically right to test the herd behaviour on other days for the robustness.

Table 3 provides the regression estimates for the overall sample and the estimates across industries during Tuesday, Wednesday, Thursday and Friday. On Thursday, it documented the coefficient of upper bound (b1), indicates that the dummy variable is positively significant for entire industries except Technology Industry. The coefficient of lower bound (b2) documented a negatively significant relationship only in the sectors of Construction, Finance, Hotels, Industry, Mining, and Plantation. Meanwhile, the industrial sectors of Property, and Trading and Services Industry show a positive relationship. Relate back to the pre-requisite of the herd behaviour[4], it can be concluded that there is no herd behaviour during Tuesday on the entire industry.

For the estimation of herding behaviour on Wednesday, the findings showed that the upper bound (b1) is mostly positive in terms of coefficient. It was only Mining Industry and Technology industry, which had the negative coefficient. In terms of lower bound (b2), this research shows that four industries have a negatively significant relationship; which are: Construction, Consumer, Finance, and Plantation. However, these mentioned industries did not have a negatively significant relationship of upper bound (b1) to the normal distribution. Hence, it can be remarked that there is no herd behaviour during Wednesday on the entire Industry. The Thursday's findings showed most of Industries have positively significant results, except the Plantation Industry. This industry has a positive sign but not significant towards the normal distribution of the rational asset pricing hypothesis. The Table also shows that only Construction, Finance, and

Plantation Industry have a negative coefficient. Interestingly, these industries, even though have a negative coefficient, but it is not significant in 5% level. In a short, there is no herd behaviour evidence that can be found during Thursday. Lastly, the Friday's results documented unfavoured dossier of the herd behaviour in Malaysia market. The upper bound (b1) is positively significant on the entire industries. Meanwhile, some was negatively significant on the lower bound, such as Construction, and Plantation. Strictly speaking, after finding no herd behaviour during trading day of Tuesday, Wednesday, Thursday, and Friday, but found the herd formation on Monday, we cannot reject the hypothesis of the herd behaviour is the determinant of Monday irrationality. Interestingly, this hypothesis is only applied on small caps industries such as Hotel, Mining and Technology. Indeed, it makes our conclusion become more robust.

The results are consistent with the predictions of rational asset pricing. Under both criteria for extreme market movements, the coefficients estimates were reliably and uniformly reject the herd behaviour hypothesis. As a result, the prediction of rational asset pricing under the 5% criterion apparently confines a conclusion where herding behaviour did not occur from Tuesday to Friday. This is in line with our expectation that herding behaviour does only stroke the Monday irrationality. This finding advises cognition bias such as cognitive dissonance influenced the decision making of investor on Monday, but not on other days. Interestingly, when doing the decision making by herding, it herds towards the size of the effect. It showed by the findings that herding behaviour only occurred in small size industry.

Industrials' Monday Irrationality

This section addresses the robustness check of our herd formation results. In the previous section, the evidence of the herd behaviour is documented on three industries, which are: Hotel, Mining and Technology. Thereby, this section addresses the evidence of Monday irrationality in Industrial mode. The purpose is to re-confirm that the Monday irrationality does occur in the industry.

Table 4 shows most of the industries had experienced Monday irrationality where the Monday coefficient is negatively significant and Friday coefficient is positively significant. Only Consumer Products and Industrial Industries did not have this calendar anomaly. The Trading and Services, and Plantation, which are the big caps industries, are reported to have the weekend effect. Indeed, the small caps' industries such as Hotel, Mining and Technology have also documented the day-of-the-week anomaly. This result confirms our findings where we found the herd formation on small caps on Monday.

Table 4
Day-of-the-week anomaly result by industries

Sector	Monday	Tuesday	Wednesday	Thursday	Friday
Construction	-0.0018***	0.0021***	0.0018**	0.0019**	0.0030***
	(0.001)	(0.008)	(0.023)	(0.018)	(0.000)
Consumer Products	-0.0003	0.0005	0.0006*	0.0007*	0.0011***
	(0.294)	(0.205)	(0.099)	(0.081)	(0.005)
Finance	-0.0008*	0.0012	0.0010*	0.0009	0.0016***
	(0.074)	(0.154)	(0.092)	(0.152)	(0.008)
Hotel	-0.0009***	0.0005**	0.0016**	0.0008**	0.0018***
	(0.002)	(0.035)	(0.012)	(0.014)	(0.000)
Industrial Industry	-0.0004	0.0006	0.0007	0.0007	0.0010**
	(0.203)	(0.225)	(0.135)	(0.142)	(0.033)
Mining	-0.0008*	0.0005*	0.0002*	0.0028**	0.0021**
	(0.094)	(0.079)	(0.091)	(0.011)	(0.024)
Plantation	-0.0019***	0.0015**	0.0026***	0.0022***	0.0032***
	(0.000)	(0.022)	(0.000)	(0.001)	(0.000)
Property	-0.0019***	0.0015**	0.0026***	0.0022***	0.0032***
	(0.000)	(0.022)	(0.000)	(0.001)	(0.000)
Trading and Service	-0.0008**	0.0010**	0.0015***	0.0010*	0.0014**
	(0.031)	(0.010)	(0.007)	(0.090)	(0.015)
Technology	-0.0027***	0.0013**	0.0035***	0.0022**	0.0033***
	(0.000)	(0.016)	(0.000)	(0.020)	(0.000)

Note: * Figure stated is the coefficient and the probability values (inside the parentheses). ** and *** denote 5%, and 1% statistically significance. The formula was adopted from French (1980):
$R_t = \alpha + \gamma_1 d_{Tue,\,t} + \gamma_2 d_{Wed,\,t} + \gamma_3 d_{Thu,\,t} + \gamma_4 d_{Fri,\,t} + \gamma_5 R_{t-1} + \varepsilon_t$

In a short, it concluded that this calendar anomaly also occurs in these big caps. We suspect other psychological biases, such as affection bias, heuristic bias, or other cognition biases, as the factors; but not the cognitive dissonance of investors. Future research can cover this issue.

CONCLUSION

The main finding of this study is that herd behaviour is the determinant of Investor's Monday irrationality in Malaysian stock market, particularly in small cap industries. We build this claim based on our four-layer test result. First, it is found that the day-of-the-week anomaly in Malaysia; and it did not disappear through time. Second, herd behaviour did not exist in market downswings and market upswings through the week. It implies that the irrationality of investor in a week cannot be explained by the herd behaviour.

This research continued to investigate the calendar anomaly in detail. We found the herd behaviour only on Monday data set, but not on other days. It implies the herd behaviour only made the Monday returns not others return. After finding the herd behaviour based on Monday return, we found the herd behaviour did exist on small cap industries questioning the rational behaviour assumption of traditional finance. In other words, investor did not rely on fundamental information in making decision. Investors were affected by psychological biases such as cognitive dissonance in trading during Monday.

To make it more robust, we run again the Christie and Huang (1995) model on other days. As the result, the herd formation could not be found on Tuesday, Wednesday, Thursday and Friday. Hence, it can be surmised that herd behaviour is the determinant of Monday irrationality in small cap industries.

To ratify this conclusion, we extended our investigation in more detail by examining it in the industrial mode. Our findings showed there is Monday irrationality in those three herd formation industries (Hotel, Mining and Technology). It confirmed our findings and strengthened our conclusion.

This calendar anomaly was also found in other industries such as: Trading and Services, Finance, and Plantation. We remarked the existence of Monday irrationality in these other industries drove by other psychological biases such as affection bias, heuristic bias, or other cognition biases.

Monday irrationality has not explored deeper in traditional finance. Therefore, we empirically propose herd behaviour as the determinant of Monday irrationality. The explanation beyond the role of the herd behaviour on Monday irrationality is that investors have to explore more information with limited time as Monday is the first day of trading. Further, this type of investors also wants to share the blame in decision-making (Scharfstein & Stein, 1990). This is in line with previous research in Malaysia stock market with regard of the investor behaviour. For instance, Isa and Lim (1995) found the investor in Malaysia tends to be more speculative by following the market sentiment. Nik Maheran and Ismail (2008) strengthen this conclusion by documenting the Malaysian investor behaviour on following the sentiment. Toh and Ahmad (2010) addressed the reference dependence as the reason why Malaysian investors tend to follow whatever they think is right. Moreover, most of the investor in Malaysian stock market is individual investor. The low quality of information in the market drives also the presence more speculators. This type of investors might suppress their belief by sharing the blame and reasoning the justification by using their cognitive dissonance. The activating events, such as no information during Monday, but heavily weighted transaction, encouraged individual investors just

to follow the behaviour institutional investors or simply follow the market. This occasion caused the anomalous returns to be more significantly dispersed from Monday than from other days. Therefore, it might be true that herd behaviour in Malaysian stock market strokes Monday irrationality.

Now we turn to the result that big cap industries have Monday irrationality. The findings contradict the consensus in portfolio management where investor, who trades heavily in big caps, has more rational and information. The irrationality of investor, if there is any, might be caused by affection not cognition. Future research should tackle this issue.

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NOTES

1. We follow the procedure of Wong et al. (2006) in examining the disappearance of Monday Irrationally by split the period into 2 sub-periods.
2. Christie and Huang (1995) explained the herd behaviour from the perspective of rational asset pricing. The dispersion from normal distribution is the benchmark of herd behaviour. If the upper bound and lower bound are negatively significant, it implies the herd behaviour.
3. Refer back to Equation 2 regarding how we calculate the returns.
4. Note that in Christie and Huang's (1995) model, the industrial sector has to be negatively significant on the upper bound and lower bound to be concluded as herding influenced.

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