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# DO MALAYSIAN INVESTORS' JUDGEMENT EXHIBIT REFERENCE DEPENDENCE?

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## ABSTRACT

*The pleasure of obtaining gains and the pain of incurring losses is a powerful motivating factor determining the trading behaviour of investors. The evaluation of gains and losses is dependent on the reference point. The purpose of this research is fourfold. Firstly, we investigate whether daily extreme price changes catch the attention of investors. Secondly, we determine whether investors' judgement exhibits reference dependence. Thirdly, we investigate whether an attention-based strategy could provide temporary profit-making opportunity to investors. Finally, we evaluate the impact of the reference point on the stock values. We find evidence not only that investors are attention-driven, but also that their judgement displays reference dependence. The attention-based strategy does not generate positive abnormal returns except for strategy of buying portfolios consisting of loser stocks. Moreover, the portfolios whose current price rises above (or falls below) its 52-week high (or 52-week low) at the date of formulation tend to underperform (or outperform) in the subsequent period.*

**Keywords:** Prospect Theory, efficient market hypothesis, attention hypothesis, reference point, reference dependence, attention-based strategy

## INTRODUCTION

In the early 1980s, prospect theory was developed by the psychologists Daniel Kahneman and Amos Tversky. In their numerous experiments, they uncovered a number of empirical regularities or anomalies that cannot be easily reconciled

with expected utility theory. In real life, the behaviour of decision makers is apparently incompatible with the rationality assumptions held by economists. This prompted Kahneman and Tversky (1979) to develop a parsimonious theory to explain such deviations. In its original form, prospect theory is concerned with how decision makers behave when faced with a choice between two alternatives, that is, prospects or gambles, under conditions of uncertainty. A modified version of prospect theory called cumulative prospect theory (Tversky and Kahneman, 1992) has been introduced. Later, Schmidt and Zank (2007) describe cumulative prospect theory as consisting of three main characteristics, namely, rank dependence, reference dependence and sign dependence. Rank dependence enables nonlinear sensitivity in probabilities to be incorporated into decision making under conditions of risk without violating stochastic dominance. Reference dependence means that utility from an investment is not simply a function of the wealth level. In the stock market, it is based on investors' subjective feelings with no regard to the "true" value of the stocks. Finally, sign dependence leads to the allocation of different decision weights to losses and gains. An important implication of prospect theory is that the way that investors subjectively perceive an outcome affects the utility that they expect, which appears to be inconsistent with the rationality assumption. Another implication of prospect theory is that, in contrast to the additive utility function, utility is reference based, where the decision-making behaviour of investors is dependent on the reference point.

The Malaysian stock market is a good ground to test this reference-based biased. A survey was conducted by Bursa Malaysia in 1998 on the equity distribution of companies (as listed on its official list as at 31 December 1997), the results show that individuals represent the largest group of investors (which account for 87.9% of total investors) in the Malaysian stock market, followed by nominees and institutions, which represent only 9.1% and 2.8% of total investors, respectively. According to statistics published in the financial results of Bursa Malaysia Berhad for the year 2008, retail participation in terms of the value of equity held has been increasing from 1993 to 2003. Subsequently, there was a drop in retail participation due to weak investor sentiment. Based on the statistics here, we have sufficient evidence to support that retail investors are the most significant group of investors in Bursa Malaysia, in particular during the study period from 1993 to 2004. In view of this investor profile, many professional analysts believe that the Malaysian stock market is dominated by many irrational "noise traders" who respond to sentiment and fads. Furthermore, they also believe that the investors in Malaysia are less sophisticated compared to their counterparts in developed markets mainly due to the limited access to information pertaining to the stock market. In addition, there is also a number of studies (for example, Grinblatt and Keloharju (2000); Hand (1990); and Lee, Shleifer and Thaler (1991)) that state that individual investors are less

sophisticated compared to institutional investors and that individual investors' trading behaviours could be a source of market inefficiencies. Therefore, there have always been questions about whether the Malaysian stock market is manipulated and dominated by rumours. In line with this opinion, Md. Isa and Lim (1995) conducted a survey pertaining to the investors' demographics and investment characteristics in the Kuala Lumpur and Petaling Jaya areas. The survey was conducted over an eight-week period in the beginning of 1992 through personal interviews and a self-administered drop-off method. The results show that investors in Malaysia are those in the middle and upper economic classes with a respectable level of education, career and income. However, Md. Isa and Lim (1995) highlight that the majority of the investors are in fact speculators in the market.

This paper modifies and extends the attention hypothesis discussed by Toh and Ahmad (2007). Instead of using an unusually high trading volume, this paper employs daily extreme price changes (i.e., daily winner and loser stocks) as an attention-grabbing event to investigate whether the daily winner and loser stocks could catch the attention of investors and act as a trigger to induce greater trading activity. It then extends the study by incorporating the reference points (i.e., 52-week high and 52-week low) to determine whether investors' judgement exhibits reference dependence. We further investigate whether the attention-based strategy could provide a temporary profit-making opportunity to investors.

The results of the study have both theoretical and empirical significance. First, this study builds on research in behavioural finance, which is still a very young field, even in developed markets and especially in emerging markets. Secondly, if the results of the study demonstrate that investors' judgement exhibits reference dependence, they help to increase awareness among investors about these behavioural tendencies and improve their investment strategies. Thirdly, the results of the research may also provide evidence on the role of behavioural factors in influencing trading volume. Fourthly, the results of the study may help to determine whether the rationality assumption holds in the real world. If the rationality assumption does not hold, the results of the study may also provide evidence as to whether the efficient market hypothesis is still applicable in the real world. Finally, the results of the study may also help to determine whether human psychology could explain the behaviour of markets better and help to gauge the validity of the prospect theory.

## LITERATURE REVIEW

In view of the cognitive and temporal limitation, investors tend to limit their search effort to stocks that have caught their attention [Odean (1999)]. This will

help to cope with the difficulty of searching for information pertaining to a large number of stocks they can potentially buy (i.e., all the stocks that are available in the market). Yantis (1998) states that attention can either be goal driven or stimulus driven. Attention is goal driven when it is controlled by investors' planned strategies and intentions in a "top-down" fashion. For instance, if investors believe in a high volume premium, they will use this as their investment strategy. When they are looking for a stock to buy, then heavily traded stocks in general are likely to be selected by attention. In contrast, attention is stimulus driven when it is controlled by salient attributes of some events in a "bottom-up" fashion. For instance, a stock that is more heavily traded than other stocks might seem to "pop out" of the background and automatically draw investors' attention. Gervais, Kaniel and Mingelgrin (2001) address the attention hypothesis and find that stocks experiencing unusually high trading volume induce greater trading activity. In the Malaysian context, Toh and Ahmad's (2007) finding also demonstrates that when stocks experience abnormally high trading volume, the volume residuals are greater than usual. This study provides evidence consistent with the idea of Miller (1977) and Mayshar (1983) that heavily traded stocks will increase visibility. Heavily traded stocks are moved from the broader universe of less visible stocks to a subset of visible stocks. Once the stocks are in this subset, they catch the attention of investors and are more likely to be purchased. This is what Yantis describes as stimulus-driven attention.

In line with the proposition of Kahneman and Tversky (1979), Ferris, Haugen and Makhija (1988) examine the trading volume of 30 of the smallest stocks following price changes. They report that stocks with gains have positive abnormal volume, whereas stocks with losses have negative abnormal volume. This is similar to the evidence of the disposition effect documented by Shefrin and Statman (1985). The evidence may also suggest that the reference point plays a major role in determining the trading behaviour of investors where the stock price at the time of purchase may be the reference point. In an experimental setting, Gneezy (1998) provides evidence that the 52-week high (i.e., the maximum stock price attained in the prior year) may be a more salient reference point than the purchase price. A number of studies on stock options provide evidence demonstrating that employees exercise their options at the time when stock price exceeds the 52-week high. The result of this finding is also consistent with the idea of the 52-week high serving as a reference point in deciding investors' trading behaviour [Core and Guay (2001), Heath, Huddart and Lang (1999), Huddart and Lang (2002), and Poteshman and Serbin (2001)].

Huddart and Yetman's (2002) examination of the trading volume of a stock and its past price path demonstrates that there is a substantial increase in trading volume when the current price exceeds the 52-week high. The 52-week high has a larger significant effect than other candidate price thresholds (i.e., the

25th percentile, the median and the 75th percentile of the distribution of past prices). The evidence is consistent with the fact that investors use the 52-week high as a reference point to guide them in making trading decisions. They also find that the effect is stronger for NASDAQ stocks where individual ownership is greater than for NYSE and AMEX stocks. This is consistent with a negative relationship between investor sophistication and reliance on reference points. They also suggest future research to also extend the examination to other reference points such as the 52-week low. This has prompted us to investigate another possible reference point (i.e., 52-week low) and the impact of reference points on stock values.

## RESEARCH DESIGN AND METHODOLOGY

This paper uses data for stocks listed on Bursa Malaysia. The data are obtained from Pusat Komputer Professional, a company located in Pahang, Malaysia. The database contains daily closing prices, daily high and low prices, as well as the volume of transactions. Adjustments were made to take stock splits, rights and dividends into consideration. The time period examined in this study covers a total of 2,959 trading days from 1 January 1993 to 31 December 2004.

All stocks listed on the main board before January 1992 are included in the analysis except for:

(i) Second Board and MESDAQ stocks;
(ii) All newly listed stocks together with those suspended from trading (i.e., PN4 conditions stocks) or Those that have been delisted;
(iii) Stocks with a significant amount of missing data;
(iv) Stocks from the banking industries.

Stocks from the banking industries were excluded from the sample because they have capital and revenue structures that are significantly different from those of other industries.

We employ a market-adjusted approach to measure the abnormal performance of the sample. Brown and Warner (1980, 1985) find that sophisticated expected returns models for identifying abnormal performance of stocks do not perform better than simple models. Moreover, DeBondt and Thaler (1985) document that the results are not sensitive to the different models used to measure the abnormal performance. Daily market-adjusted abnormal returns, *AR*s, of stock *i* are calculated as follows:

$$AR_{it} = R_{it} - R_{mt}, \quad (1)$$

where $R_{it}$ is the return of stock *i*, and
$R_{mt}$ is the return of the market.

Cumulative abnormal returns, *CAR*s, are then calculated over a year as follows:

$$CAR_i = \sum_{t=1}^{T} AR_{it}, \quad (2)$$

where *T* is the number of days over the one-year-period.

Unlike Barber and Odean (2003), we adopt the event study methodology to investigate market reactions during the period of extreme past price changes. If the attention hypothesis is true, we would expect to observe that investors actively trade on attention-grabbing stocks (i.e., daily extreme price change), proxied by the high abnormal trading volume. The event date for a stock reaching its highest return (i.e., winner stock) and its lowest return (i.e., loser stock) is obtained by sorting the stocks on the basis of their daily market-adjusted abnormal stock returns in descending order. Determining the observation interval, that is, the event window, and the estimation period is difficult. Based on previous studies, there is no optimal length of observation interval. In this research, we employ four different observation windows i.e., 3-day, 7-day, 15-day and 31-day. When a 3-day observation window is employed, it comprises one pre-event day, the event day and one post-event day. A 7-day observation window comprises three pre-event days, the event day and three post-event days. When a 15-day observation window is employed, it comprises seven pre-event days, the event day and 7 post-event days. Finally, a 31-day observation window comprises fifteen pre-event days, the event day and 15 post-event days.

For each event, 120 trading days prior to the 31-day event window are used as the estimation window. It helps to estimate the market reactions during the event window in the absence of the event. Based on the daily trading volume data in the observation window, the residuals were then estimated. For empirical purposes, the trading volume is transformed into residual through the following equation:

$$V_{it} = a_i + b_i V_{mt} + v_{it} \quad (3)$$

where $V_{it}$ is the daily shares of stock *i* traded / shares of stock *i* outstanding,

$V_{mt}$ is the daily shares traded on Bursa Malaysia/total Bursa Malaysia shares outstanding,
$v_{it}$ is the volume residual for stock *i*, and
$a_i$ *and* $b_i$ are the regressions coefficient and constant determined by simple regression using daily data for up to 120 days before the 31- test period.

The next step involves estimating the volume residuals for each of the different observation windows (test periods). The volume residuals are defined as

$$v_{it} = V_{it} - (a_i + b_i V_{mt}) . \quad (4)$$

Two different tests of significance, a parametric t-test and a non-parametric binomial test, are used to investigate the volume changes (i.e., $v_{it}$) of each day. A parametric t-test assumes that the standardised volume residuals are independent and distributed *N(0,1)*. The binomial test is conducted by counting the number of times the volume residual is greater than 1 at each date over the 31-trading-day observation window. The tests described above examine whether the absolute volume residual for each day were significantly different than average for each sample.

To investigate whether investors' judgement exhibits reference dependence, we use the 52-week high and 52-week low as the reference points and the samples were further partitioned when:

(i) The stock price at the event date rises above its 52-week high,
(ii) The stock price at the event date falls below its 52-week low.

We then use the procedure mentioned earlier to estimate the volume residuals for each of the different observation windows. Both the parametric *t*-test and nonparametric binomial test are used to investigate the volume changes throughout the different observation windows.

It is also the purpose of this paper to determine whether the attention-based strategy provides any profit-making opportunity to investors. The winner and loser stocks are ranked based on their daily market-adjusted abnormal returns. For each test period, the winner (loser) portfolio contains 30 stocks with the highest (lowest) daily market-adjusted abnormal returns. We then compute the Cumulative Average Abnormal Returns (CAARs) for both portfolios. The returns of portfolios are then analysed over the subsequent trading intervals up to a maximum of one year. Four different investment holding periods are analysed i.e., 1-, 3-, 6-, 9- and 12-month. This is consistent with the notion of Graham

(1965) that in the short run, the stock market acts like a voting mechanism. However, in the long run, it behaves like a weighing mechanism. Any of the predictable patterns may have created profit-making opportunities, but in the long run, once they have been detected, investors will not be able to earn excess returns. Therefore, we believe that the trading behaviour of investors might influence the stock prices to a certain degree, at least in the short-run.

To examine the pressure of such phenomenon on stock values, each of the winner and loser stocks is further partitioned into whether the current stock price rises above (or falls below) its 52-week high (or 52-week low), and we then measure the $CAAR_i$ for each partition. The parametric t-test is employed to analyse the CAARs for the portfolios. If positive abnormal returns are detected, a generalised sign test is employed to ensure that correct conclusion is inferred from the findings.

Many event studies rely on parametric test statistics. However, a disadvantage of parametric statistics is that they embody detailed assumptions about the probability distribution of returns. Unlike parametric tests, nonparametric statistics do not require stringent assumptions about return distributions. The sign test is a nonparametric test often used in test studies (Jarrell and Poulsen, 1988; and McWilliams, 1990). However, the sign test judges the proportion of positive and negative abnormal returns against an assumed 50 percent split under the null hypothesis of no reaction to the event.

Corrado (1989) documents that rank tests could detect abnormal stock price changes better than standard parametric tests. Though it could potentially be misspecified under certain conditions, Cowan (1992) and Cowan and Sergeant (1996) provide evidence that the generalised sign test is well-specified and is powerful for detecting small positive abnormal returns. Their findings demonstrate that the generalised sign test is correctly specified (i) when sample contains thinly traded stocks; (ii) irrespective of whether variance increases or not on the event date; (iii) when a single stock in each portfolio has an extreme positive return; and (iv) when length of event window increases.

The generalised sign test examines whether the number of stocks with positive cumulative abnormal returns in the test period exceeds the number expected in the absence of abnormal returns. The number expected ( $\hat{p}$ ) is computed based on the fraction of positive abnormal returns in the 120-day estimation period:

$$\hat{p} = \frac{1}{n}\sum_{i=1}^{n}\frac{1}{120}\sum_{t=E1}^{E120} S_{it} \,, \tag{5}$$

where $S_{it} = 1 if\ AR_{it} > 0,\ S_{it} = 0 if\ AR_{it} < 0$.

The test statistic uses the normal approximation to the binomial distribution with parameter $\hat{p}$. The generalised sign test statistic ($t_G$) is

$$t_G = \frac{w - n\hat{p}}{[n\hat{p}(1-\hat{p})]^{\frac{1}{2}}}, \tag{6}$$

where $w$ is the number of stocks in the test period for which the cumulative abnormal return $CAR_i$ is positive.

If the null hypothesis is true, we expect the number of stocks with positive cumulative abnormal returns in the test period to be approximately equal to the number expected in the absence of the event. Otherwise, the number of stocks with positive cumulative abnormal returns in the test period should be significantly greater than the number expected in the absence of the event.

## FINDINGS AND DISCUSSION

Panel A of Table 1 presents the results of statistical analysis of the volume residual surrounding winner stocks. The finding shows that the total volume residuals surrounding the winner stocks are significantly greater than usual throughout the different observation windows. The post- minus pre-event volume residuals are positive, but they are statistically significant in three-day observation window only. This may indicate that investors who are attention motivated react to the previous day's winners differently. Momentum investors may react positively to the event, while contrarian investors may not. Panel B of Table 1 shows the statistical results of volume residuals surrounding the event where stocks have plunged to the lowest abnormal returns over different observation windows. The results of the total, pre-event and positive-event volume residuals are positive and statistically significant throughout the observation windows. These results support the findings of Barber and Odean (2003) that previous day's winners and losers are moved from the broader universe of less visible stocks to a subset of visible stocks. Once the stock becomes more visible, the stock is more likely to be purchased, thus inducing unusually high trading activity.

Table 1
*Volume Residuals Surrounding the Attention-Grabbing Event*

Panel A: Winner Stocks

| Observation Window | 3-day | | 7-day | | 15-day | | 31-day | |
|---|---|---|---|---|---|---|---|---|
| Volume Residual | Mean | *t*-value | Mean | *t*-value | Mean | *t*-value | Mean | *t*-value |
| Total | .3119 | 3.188** | .4099 | 3.018** | .4848 | 2.186** | .6990 | 2.196** |
| Pre-event | .0219 | 1.766* | .0931 | 2.427** | .0931 | 2.427** | .1871 | 1.915* |
| Post-event | .1236 | 3.112** | .2254 | 1.497 | .2254 | 1.497 | .3456 | 1.619 |
| Post-minus Pre-event | .1017 | 3.503** | .1323 | 1.022 | .1323 | 1.022 | .1584 | .1584 |

Panel B: Loser Stocks

| Observation Window | 3-day | | 7-day | | 15-day | | 31-day | |
|---|---|---|---|---|---|---|---|---|
| Volume Residual | Mean | *t*-value | Mean | *t*-value | Mean | *t*-value | Mean | *t*-value |
| Total | .1216 | 4.630** | .1885 | 4.073** | .3153 | 4.119** | .4944 | 4.119** |
| Pre-event | .0401 | 3.185** | .1827 | 3.251** | .1827 | 3.251** | .2937 | 3.490** |
| Post-event | .0328 | 4.505** | .0840 | 3.817** | .0840 | 3.817** | .1521 | 3.280** |
| Post-minus Pre-event | –.0074 | –.683 | –.0987 | –1.948* | –.0987 | –1.948* | –.1416 | –1.838* |

*Notes:* ** significant at 5% level.
* significant at 10% level.

This table shows the volume residuals surrounding winner and loser stocks over different observation windows (i.e., 3-day, 7-day, 15-day and 31-day). Winner stocks are defined as stocks that have skyrocketed to their highest abnormal returns, whereas loser stocks are defined as stocks that have plunged to their lowest abnormal returns. Using market-adjusted returns, we define abnormal returns, $AR_{it}$ for stock $i$ on day $t$ to be the difference between stock returns and market returns. Total volume residuals refer to the sum of volume residuals throughout the observation window. Pre-event volume residuals refer to the sum of volume residuals before the event occurred. Post-event volume residuals refer to the sum of volume residuals after the event occurred. Post-minus pre-event volume residuals refers to the difference between post-event volume residuals and pre-event volume residuals.

However, the post-event volume residuals surrounding the loser stocks are less than the pre-event volume residuals surrounding the loser stocks, causing negative post- minus pre-event volume residuals. Moreover, a comparison of Panel A and Panel B of Table 1 shows that the volume residuals surrounding the previous day's losers are smaller than that of the previous day's winners. The results demonstrate that when a stock price is rising (i.e., winner stock), investors are more willing to take on more risk, as they may have experienced a gain. They will act as though they are investing with "the casino's money", a phenomenon described by Nofsinger (2002). Therefore, the optimism in the market catches the attention of both existing and prospective investors. On the other hand, when a

stock is declining in value (i.e., a loser stock), investors become less willing to take a risk. They may have experienced a financial loss and felt a "snake bite", a phenomenon proposed by Nofsinger (2002). Nofsinger (2002) also stressed that some investors who are making losses may want to take a risk and buy loser stocks because of the need for breaking even. Therefore, the pessimism in the market will discourage some investors from buying the stocks. As such, the volume residuals surrounding loser stocks are less than those of winner stocks.

Table 2
*Mean Volume Residuals and Results of Binomial Test for Winner and Loser Stocks*

| Date | Panel A: Winner stocks | | Panel B: Loser stocks | |
|---|---|---|---|---|
| | Mean Volume Residual | Observed Probabilities (Volume Greater Than Zero) | Mean Volume Residual | Observed Probabilities (Volume Greater Than Zero) |
| –15 | .0050 | .52 | .0123 | .57 |
| –14 | .0097 | .57 | .0153 | .71** |
| –13 | .0068 | .48 | .0133 | .63** |
| –12 | .0100 | .51 | .0159 | .59** |
| –11 | .0098 | .47 | .0121 | .65** |
| –10 | .0235 | .44 | .0129 | .60** |
| –9 | .0145 | .52 | .0178 | .58** |
| –8 | .0146 | .50 | .0135 | .60** |
| –7 | .0152 | .46 | .0236 | .56** |
| –6 | .0089 | .50 | .0188 | .64** |
| –5 | .0071 | .52 | .0210 | .64** |
| –4 | .0084 | .59* | .0265 | .66** |
| –3 | .0094 | .62** | .0241 | .66** |
| –2 | .0222 | .66** | .0285 | .73** |

*Notes:* ** significant at 5% level.
* significant at 10% level.
This table shows the mean volume residuals surrounding winner and loser stocks throughout the 31-day observation window. A binomial test is conducted by counting the number of times the volume residuals is greater than zero at each date over the 31-day observation window. The observed probabilities refer to the probability that volume residuals are greater than zero.

Using the nonparametric binomial test, we find that the winners have significant results on –4 day until day +15 (Table 2). The results are stronger after the event date. Similar to parametric test results, the strongest results for volume residuals are on days 0 and +1 (which coincides with the three-day observation window in Panel A of Table 1). With regard to the loser stocks, we find that the strongest results for volume residuals are on day –2, –1, 0, and +1

(Table 2). Moreover, the results are stronger on days prior to the event than on days following the event. This is consistent with the results of the parametric test shown in Panel B of Table 1.

We confirmed the hypothesis that investors are attention driven. Excessive volume residuals are observed surrounding the attention-grabbing events (i.e., daily extreme past price changes). As a result of cognitive and temporal limits in making investment decisions, investors manage the problems of choosing from the hundreds of stocks that they can potentially buy by limiting the choice set. This is consistent with the proposition of Odean (1999) that investors limit the search effort to stocks that have recently caught their attention. Just like what Yantis (1998) explained, the salient attributes of attention-grabbing events make a particular stock "pop out" of the background and automatically draw investors' attention. This stimulus-driven attention induces greater trading activity. Contrarian investors will tend to buy loser stocks, believing that overreaction in the market causes loser stocks to fall below their intrinsic value and will mean-revert once the market realises its mistakes. On the other hand, momentum investors will tend to buy winner stocks, believing that conservatism causes investors to react too slowly in the face of new information and that winner stocks will continue to win.

Panel A of Table 3 demonstrates the volume residuals surrounding the winner stocks, which are traded at a price higher than their 52-week high. The results demonstrate a substantial increase in total volume residuals when the stock price rises above its 52-week high (comparing with Panel a of Table 1). The results not only show greater volume residuals but are also more statistically significant and persist over a longer observation window. Specifically, the post-minus pre-event volume residuals are positive and statistically significant. Panel B of Table 3 shows the volume residuals surrounding the loser stocks, which are traded at a price higher than their 52-week high. The findings also demonstrate that there is a substantial increase in the total, pre-event and post-event volume residuals (comparing with Panel B of Table 1). It is consistent with the proposition of prospect theory that investors' judgment exhibits reference dependence. They use the 52-week high as a reference point in making trading decisions. Once the stock price rises above its 52-week high, investors tend to perceive that things are on the right track. They become more confident in the quality of the information. The optimism in the market will attract the attention of both the existing and prospective investors. Moreover, the findings are also consistent with the evidence provided by Odean (1999) and Barber and Odean (1999) that overconfidence causes investors to trade more.

Table 3
*Volume Residuals Surrounding Winner and Loser Stocks (Traded at a Price Higher Than Their 52-Week High)*

Panel A: Winner Stocks

| Observation Window | 3-day | | 7-day | | 15-day | | 31-day | |
|---|---|---|---|---|---|---|---|---|
| Volume Residual | Mean | *t*-value | Mean | *t*-value | Mean | *t*-value | Mean | *t*-value |
| Total | .7562 | 3.223** | 1.0202 | 3.245** | 1.2483 | 2.445** | 1.7188 | 2.430** |
| Pre-event | .0749 | 2.274** | .2859 | 3.676** | .2859 | 3.676** | .4743 | 2.440** |
| Post-event | .2816 | 3.149** | .5627 | 1.597 | .5627 | 1.597 | .8449 | 1.688* |
| Post-minus Pre-event | .2067 | 3.296** | .2768 | .887 | .2768 | .887 | .3705 | .811 |

Panel B: Loser Stocks

| Observation Window | 3-day | | 7-day | | 15-day | | 31-day | |
|---|---|---|---|---|---|---|---|---|
| Volume Residual | Mean | *t*-value | Mean | *t*-value | Mean | *t*-value | Mean | *t*-value |
| Total | .6790 | 2.990** | 1.3187 | 2.530** | 2.4445 | 2.823** | 3.3524 | 3.443** |
| Pre-event | .3378 | 2.464** | 1.7420 | 2.487** | 1.7420 | 2.487** | 2.3745 | 2.981** |
| Post-event | .1273 | 3.997** | .4885 | 3.623** | .4885 | 3.623** | .7639 | 3.670** |
| Post-minus Pre-event | –.2105 | –1.770* | –1.2535 | –2.036** | –1.2535 | –2.036** | –1.6106 | -2.217** |

*Notes:* ** significant at 5% level.
* significant at 10% level.
This table shows the volume residuals surrounding winner and loser stocks that are traded at a price higher than their 52-week high over different observation windows (i.e., 3-day, 7-day, 15-day and 31-day). The 52-week high is defined as the highest price achieved by stocks over the previous year. Total volume residuals refer to the sum of volume residuals throughout the observation window. Pre-event volume residuals refer to the sum of volume residuals before the event occurred. Post-event volume residuals refer to the sum of volume residuals after the event occurred. Post- minus pre-event volume residuals refers to the difference between post-event volume residuals and pre-event volume residuals.

With respect to the results of nonparametric binomial test for winner stocks, we find that the sample has significant results on day –6, day –4 until day +15 (Panel A of Table 4). The results are stronger for post-event volume residuals. Similar to parametric test results, the evidence suggests that investors use the 52-week high as a reference point to determine their trading decisions. With regard to the loser stocks, the results of nonparametric binomial test shows that the total sample has significant results on day –14, –11 to +9, +11 and +14 (Panel B of Table 4). Moreover, the pre-event results are stronger than the post-event results. This is consistent with the results of the parametric test.

Table 4
*Mean Volume Residuals and Results of Binomial Test for Winner and Loser Stocks (Traded at a Price Higher Than Their 52-Week High)*

| Date | Panel A: Winner stocks | | Panel B:Loser stocks | |
|---|---|---|---|---|
| | Mean Volume Residual | Observed Probabilities (Volume Greater Than Zero) | Mean Volume Residual | Observed Probabilities (Volume Greater Than Zero) |
| –15 | .0098 | .46 | .0457 | .58 |
| –14 | .0182 | .42 | .1002 | .61* |
| –13 | .0085 | .55 | .0441 | .52 |
| –12 | .0132 | .53 | .0793 | .51 |
| –11 | .0231 | .51 | .0676 | .62** |
| –10 | .0555 | .50 | .0736 | .65** |
| –9 | .0306 | .58 | .1115 | .60* |
| –8 | .0295 | .58 | .1106 | .61* |
| –7 | .0350 | .54 | .1624 | .66** |
| –6 | .0219 | .61** | .1869 | .70** |
| –5 | .0172 | .56 | .2034 | .66** |
| –4 | .0358 | .58* | .2939 | .66** |
| –3 | .0495 | .64** | .2637 | .74** |
| –2 | .0516 | .66** | .2939 | .80** |
| –1 | .0749 | .80** | .3378 | .76** |
| 0 | .3995 | .99** | .2140 | .84** |
| +1 | .2816 | .93** | .1273 | .79** |
| +2 | .1026 | .86** | .0460 | .72** |
| +3 | .0603 | .82** | .0361 | .63** |
| +4 | –.0102 | .80** | .0560 | .66** |
| +5 | .0317 | .80** | .0667 | .65** |
| +6 | .0378 | .76** | .0526 | .63** |
| +7 | .0588 | .81** | .1039 | .69** |
| +8 | .0529 | .81** | .0930 | .62** |
| +9 | .0590 | .82** | .0562 | .61* |
| +10 | .0283 | .73** | .0223 | .56 |
| +11 | .0342 | .75** | .0213 | .61* |
| +12 | .0245 | .76** | .0221 | .58 |
| +13 | .0393 | .72** | .0025 | .58 |

(*continued*)

Table 4 (*continued*)

| Date | Panel A: Winner stocks | | Panel B:Loser stocks | |
|---|---|---|---|---|
| | Mean Volume Residual | Observed Probabilities (Volume Greater Than Zero) | Mean Volume Residual | Observed Probabilities (Volume Greater Than Zero) |
| +14 | .0253 | .67** | .0141 | .61* |
| +15 | .0185 | .68** | .0439 | .57 |

*Notes:* ** significant at 5% level.
* significant at 10% level.
This table shows the mean volume residuals surrounding winner and loser stocks that re-traded at a price higher than their 52-week high throughout the 31-day observation window. A binomial test is conducted by counting the number of times the volume residual is greater than zero on each date over the 31-day observation window. Observed probabilities refers to the probabilities of volume residuals greater than zero.

Panel A of Table 5 shows volume residuals surrounding winner stocks that are traded at a lower price than their 52-week low over different observation windows. The finding demonstrates that post-event volume residuals are positive and statistically significant. Panel B of Table 5 shows volume residuals surrounding loser stocks when they are traded at a price lower than their 52-week low. There is also a substantial increase in post-event volume residuals, and they are statistically significant. The findings are in support of the proposition of Prospect Theory that investors use a 52-week low to serve as a benchmark to determine their trading decisions. When the stock price falls below its 52-week low, investors may perceive that it is a good buy, as the stock is traded at a value less than its intrinsic value. Therefore, it will encourage investors to buy more stocks.

However, trading activity is much lower when the stock price falls below its 52-week low compared with when stock price rises above its 52-week high. When current stock price falls below its 52-week low, the fear of incurring losses will discourage some investors from making the decision to buy the stock. This is consistent with loss aversion and the snake bite effect identified by Kahneman and Tversky (1979) and Nofsinger (2002), respectively.

The results of a nonparametric binomial test for winner stocks show significant results on days–1 and 0 (see Table 6). For loser stocks, the results of the nonparametric binomial test demonstrate that the sample has significant results on day 0, +1, and +2 (Table 6). Both findings are similar to the parametric test's results. Once again, the evidence suggests that investors use the 52-week low as a reference point to determine their trading decisions. Once the current stock price falls below its 52-week low, investors perceive it as a good buy. As a result, it induces greater-than-usual trading volumes.

Table 5
*Volume Residuals Surrounding Winner and Loser Stocks*
*(Traded at a Price Lower Than 52-Week Low)*

Panel A: Winner Stocks

| Observation Window | 3-day | | 7-day | | 15-day | | 31-day | |
|---|---|---|---|---|---|---|---|---|
| Volume Residual | Mean | *t*-value | Mean | *t*-value | Mean | *t*-value | Mean | *t*-value |
| Total | .0391 | 2.920** | .0801 | 2.940** | .1295 | 2.445** | .1911 | 1.955* |
| Pre-event | .0193 | 2.043** | .0566 | 2.415** | .0566 | 2.415** | .0618 | 1.855* |
| Post-event | .0084 | 2.209** | .0615 | 1.837* | .0615 | 1.837* | .1179 | 1.715* |
| Post-minus Pre-event | –.0110 | –1.193 | .0049 | .172 | .0049 | .172 | .0561 | 1.093 |

Panel B: Loser Stocks

| Observation Window | 3-day | | 7-day | | 15-day | | 31-day | |
|---|---|---|---|---|---|---|---|---|
| Volume Residual | Mean | *t*-value | Mean | *t*-value | Mean | *t*-value | Mean | *t*-value |
| Total | .0622 | 2.684** | 2.724 | 2.724** | 2.497 | 2.497** | 2.432 | 2.432** |
| Pre-event | –.0003 | –.177 | 1.195 | 1.195 | 1.195 | 1.195 | 1.053 | 1.053 |
| Post-event | .0360 | 2.221** | 2.258 | 2.258** | 2.258 | 2.258** | 2.268 | 2.268** |
| Post-minus Pre-event | .0362 | 2.212** | .0253 | .623 | .0253 | .623 | .0282 | .483 |

*Notes:* ** significant at 5% level.
* significant at 10% level.

This table shows the volume residuals surrounding winner and loser stocks that are traded at a price lower than their 52-week low over different observation windows (i.e., 3-day, 7-day, 15-day and 31-day). The 52-week low is defined as the lowest price achieved by stocks over the previous one year. Total volume residuals refer to the sum of volume residuals throughout the observation window. Pre-event volume residuals refer to the sum of volume residuals before the event occurred. Post-event volume residuals refer to the sum of volume residuals after the event occurred. Post- minus pre-event volume residuals refer to the difference between post-event volume residuals and pre-event volume residuals.

Table 6
*Mean Volume Residuals and Results of Binomial Test for Winner and Loser Stocks (Traded at A Price Lower Than 52-Week Low)*

| Date | Panel A: Winner stocks | | Panel B: Loser stocks | |
|---|---|---|---|---|
| | Mean Volume Residual | Observed Probabilities (Volume Greater Than Zero) | Mean Volume Residual | Observed Probabilities (Volume Greater Than Zero) |
| –15 | .0015 | .44 | .0095 | .39 |
| –14 | –.0001 | .44 | .0013 | .39 |
| –13 | –.0006 | .43 | –.0017 | .41 |
| –12 | .0005 | .40 | –.0033 | .45 |
| –11 | –.0002 | .40 | –.0027 | .43 |
| –10 | –.0001 | .45 | .0006 | .42 |
| –9 | .0014 | .51 | .0052 | .37 |
| –8 | .0028 | .52 | .0005 | .42 |
| –7 | .0026 | .48 | .0127 | .42 |
| –6 | .0036 | .51 | .0090 | .33 |
| –5 | .0050 | .60 | .0068 | .37 |
| –4 | .0055 | .57 | .0048 | .44 |
| –3 | .0089 | .59 | .0076 | .50 |
| –2 | .0118 | .60 | –.0001 | .40 |
| –1 | .0193 | .64** | –.0003 | .40 |
| 0 | .0114 | .65** | .0265 | .72** |
| +1 | .0084 | .52 | .0360 | .66** |
| +2 | .0122 | .57 | .0122 | .63** |
| +3 | .0081 | .55 | .0047 | .58 |
| +4 | .0142 | .47 | .0054 | .50 |
| +5 | .0101 | .53 | .0021 | .49 |
| +6 | .0051 | .51 | .0012 | .52 |
| +7 | .0034 | .52 | .0043 | .53 |
| +8 | .0096 | .57 | .0052 | .49 |
| +9 | .0186 | .53 | .0019 | .43 |
| +10 | .0056 | .52 | .0009 | .43 |
| +11 | .0042 | .45 | .0034 | .50 |
| +12 | .0081 | .53 | .0004 | .44 |
| +13 | .0044 | .45 | .0018 | .50 |

(*continued*)

Table 6 (*continued*)

| Date | Panel A: Winner stocks | | Panel B: Loser stocks | |
|---|---|---|---|---|
| | Mean Volume Residual | Observed Probabilities (Volume Greater Than Zero) | Mean Volume Residual | Observed Probabilities (Volume Greater Than Zero) |
| +14 | .0028 | .44 | .0002 | .46 |
| +15 | .0031 | .40 | –.0015 | .43 |

*Notes:* ** significant at 5% level.
* significant at 10% level.
This table shows the mean volume residuals surrounding winner and loser stocks that are traded at a price lower than their 52-week low throughout the 31-day observation window. A binomial test is conducted by counting the number of times the volume residuals is greater than zero at each date over the 31-day observation window. The observed probabilities refers to the probabilities of volume residuals is greater than zero.

Based on the above findings, we confirm the hypothesis that investors are reference-dependent. This study provides evidence supporting the notion given by Kahneman and Tversky (1979) in the prospect theory that peoples' judgements display reference dependence. When making trading decisions, investors tend to evaluate each of the edited options and choose the option with the highest value. The overall value of an edited option is defined in terms of gains and losses relative to a certain reference point. The reference points used are the readily available statistics, namely the 52-week high and the 52-week low. Obviously, the result is also consistent with Kahneman and Riepe's (1998) findings that when investors make investment decisions, they tend to deviate from the standard decision making model. They do not look at the wealth they attain in the end, but rather they consider the gains or losses relative to some reference point. This is in contrast with the rationality assumption of Efficient Market Hypothesis (EMH) that investors value stocks in a rational manner. According to Shleifer (2000), investors are assumed to be rational and would value each stock based on its fundamental value. In reality, investors exhibit a totally different kind of behaviour. They appear to invest in a manner that is against the rationality paradigm. They evaluate stocks relative to a reference point and not the fundamental value. The reference point serves as a benchmark that determines whether investors feel the pleasure of obtaining a profit or the pain of a loss. Ultimately, this will influence their trading behaviour.

Panel A of Table 7 shows the cumulative average abnormal returns for portfolios consisting of 30 winner stocks. The results demonstrate that winner portfolios generate negative cumulative abnormal returns and are statistically significant throughout the different investment holding periods. Investors tend to become overconfident and over-optimistic when they see winner stocks. At the peak of optimism, investor greed causes a stock to increase beyond its intrinsic value. When the market realises the mistakes, it will subsequently correct itself

and the stock price will mean-revert. Therefore, winner stocks tend to underperform in the subsequent period. This result is consistent with Barber and Odean (2003) that attention-based strategy lowers the return to investors, as they have run after winner stocks whose prices have risen too much.

Panel B of Table 7 provides the cumulative abnormal returns for portfolios consisting of 30 loser stocks. The cumulative average abnormal returns generated from the loser portfolios are positive and statistically significant for investment holding periods up to one month. When investors observe loser stocks, they tend to become more pessimistic. This is consistent with phenomenon "loss aversion" suggested by Kahneman and Tversky (1979), where losses will be rated relatively higher than profits of a similar magnitude. At the peak of pessimism, investor fear pushes a stock's price below the stock's intrinsic value. When investors realise the mistakes, the market will subsequently correct itself and the stock prices will mean-revert. Therefore, loser stocks tend to outperform in the subsequent period.

Table 7
*Cumulative Average Abnormal Returns for Attention-Based Strategies*

| Investment Holding Period | Panel A: Winner Portfolios | | Panel B: Loser Portfolios | |
|---|---|---|---|---|
| | Mean | *t*-value | Mean | *t*-value |
| 3-day | –.0599 | –5.985** | .0309 | 3.771** |
| 1-week | –.0894 | –6.771** | .0282 | 3.205** |
| 2-week | –.0924 | –5.152** | .0566 | 2.985** |
| 3-week | –.1102 | –4.938** | .0568 | 2.871** |
| 1-month | –.1208 | –7.153** | .0566 | 2.786** |
| 3-month | –.1752 | –4.155** | .0388 | .976 |
| 6-month | –.2089 | –4.989** | .0600 | 1.452 |
| 9-month | –.2402 | –3.679** | .0197 | .466 |
| 12-month | –.2614 | –4.107** | –.0310 | –.466 |

*Notes:* ** significant at 5% level.
* significant at 10% level.
This table shows the cumulative average abnormal returns for attention-based strategies for different investment holding periods (i.e., 3 days, 1 week, 2 weeks, 3 weeks, 1 month, 3 months, 6 months, and 12 months). These include portfolios of high-volume, winner and loser stocks. Each portfolio consists of 30 stocks.

The generalised sign test is employed to infer whether the observed abnormal returns for loser portfolios continue to exist because the use of parametric statistics to detect abnormal returns in the event study has a disadvantage. Parametric statistics embody detailed assumptions about the probability distribution of returns. In addition, the violations of parametric test assumptions are more likely to happen because of thin trading. The generalised sign test

examines whether the number of stocks with positive cumulative abnormal returns in the test period exceeds the number expected in the absence of an event (i.e., in the 120-day estimation period). Table 8 shows the results of the generalised sign test. The results demonstrate that the number of stocks with positive cumulative abnormal returns in the test period exceeds the number expected in the absence of an event. They are statistically significant for three-day, one-week, two-week, and three-week investment holding periods. In general, the results demonstrate the winner-loser effect where losers outperform winners, which is consistent with the findings of DeBondt and Thaler (1985, 1987). This phenomenon explains the systematic pattern of return reversal as an overreaction in the market.

Table 8
*Results of the Generalised Sign Test*

| Investment Holding Period | Frequencies (No. of stocks with positive $CAR_{TP}$ minus No. of stocks with positive $CAR_{EP}$) | | | Results of Sign Test (*2-tailed*) |
|---|---|---|---|---|
| | Negative Differences | Positive Differences | Ties | |
| 3-day | 1 | 8 | 2 | .039** |
| 1-week | 2 | 9 | 0 | .065* |
| 2-week | 0 | 9 | 2 | .004** |
| 3-week | 1 | 8 | 2 | .039** |
| 1-month | 2 | 7 | 2 | .180 |
| 3-month | 5 | 3 | 3 | .727 |
| 6-month | 3 | 4 | 4 | 1.000 |
| 9-month | 6 | 5 | 0 | 1.000 |
| 12-month | 5 | 4 | 2 | 1.000 |

Notes: ** significant at 5% level.
* significant at 10% level.
This table shows the frequencies at which the number of stocks with positive cumulative abnormal returns in the test period are less than, more than or equal to the number of stocks with positive cumulative abnormal returns in the estimation period as well as the results of the generalised sign test for the different investment holding periods (i.e., 3 days, 1 week, 2 weeks, 3 weeks, 1 month, 3 months, 6 months, 9 months and 12 months).

To examine the impact of reference dependence on the stock price movement, we partition each of the winner and loser portfolios into two separate groupings: (i) when the stock price at event date rises above its 52-week high, and (ii) when the stock price at event date falls below its 52-week low. Table 9 reveals the cumulative abnormal returns for winner and loser portfolios whose stock price at the date of event rises above its 52-week high. The results show that winner portfolios generate negative abnormal returns and that the results are statistically

significant. For loser portfolios, they also generate negative abnormal returns, but the results are not statistically significant. The findings of this study are consistent with a phenomenon in psychology called overconfidence. When stocks hit the 52-week high, investors tend to perceive that things are on the right track. They become more confident that the stock price will continue to rise and will reach a new high. Therefore, they tend to overreact to the information and run after the highly priced stocks. Investors' reaction towards those stocks are clearly shown in Table 3, where overconfidence causes investors to trade excessively, not knowing that there is a limit beyond which the stock price cannot rise. Once investors realise the mistakes, the market will subsequently correct itself, and the stock prices will mean revert. Therefore, portfolios of winner and loser stocks tend to underperform the market in the subsequent period.

Table 9
*Cumulative Abnormal Returns for Portfolios of Winner and Loser Stocks (When Current Stock Price Rises Above Its 52-Week High)*

| Investment Holding Periods | Panel A: Winner portfolio | | Panel B: Loser portfolio | |
|---|---|---|---|---|
| | Mean | *t*-value | Mean | *t*-value |
| 3-day | –.0463 | –2.423** | –.0163 | –.876 |
| 1-week | –.0766 | –3.216** | –.0105 | –.196 |
| 2-week | –.0870 | –2.766** | –.0718 | –.992 |
| 3-week | –.1058 | –2.817** | –.1072 | –1.212 |
| 1-month | –.1366 | –3.376** | –.1851 | –1.333 |
| 3-month | –.1786 | –2.601** | –.0569 | –.913 |
| 6-month | –.2399 | –3.761** | –.0568 | –.149 |
| 9-month | –.3022 | –3.695** | –.5813 | –1.352 |
| 12-month | –.1942 | –1.765 | –.6799 | –1.540 |

*Notes:* ** significant at 5% level.
* significant at 10% level.
This table shows the cumulative abnormal returns for winner and loser portfolios at the time when their current stock price rises above its 52-week high for different investment holding periods (i.e., 3 days, 1 week, 2 weeks, 3 weeks, 1 month, 3 months, 6 months, and 12 months).

The cumulative abnormal returns of winner and loser portfolios whose stock price at the event date falls below its 52-week low are shown in Table 10. Portfolios of winner stocks continue to make negative abnormal returns. The result is significant for the six–month holding period. Portfolios of loser stocks yield positive abnormal returns, and the results are significant for three-day, one-week and nine-month holding periods. Particularly for loser stocks, when investors see loser stocks, they are less willing to take on risk. This is consistent with the phenomena of "snake bite" and "loss aversion" suggested by Nofsinger (2002) and Kahneman and Tversky (1979), respectively. The situation becomes

worsen when the stock price falls below its 52-week low. Investors may perceive that something at the business has definitely gone wrong, resulting in worried and angry investors. The feeling of negativity can drive the stock price to drop lower than its intrinsic value. Once investors realise their mistake, the market will correct itself, and the price will rebound.

Table 10
*Cumulative Abnormal Returns for Portfolios of Winner and Loser Stocks (When Current Stock Price Falls Below Its 52-Week Low)*

| Investment Holding Periods | Panel A: Winner portfolio | | Panel B: Loser portfolio | |
|---|---|---|---|---|
| | Mean | *t*-value | Mean | *t*-value |
| 3-day | –.2538 | –1.346 | .4024 | 2.406** |
| 1-week | –.1653 | –.942 | .4629 | 2.967** |
| 2-week | –.1885 | –.617 | 1.0428 | 1.781 |
| 3-week | –.5223 | –1.119 | .9735 | 1.614 |
| 1-month | –.4407 | –1.178 | 1.1500 | 1.806 |
| 3-month | –.7321 | –1.485 | .4612 | .443 |
| 6-month | –.8730 | –2.744* | .5803 | .801 |
| 9-month | –.5785 | –1.891 | 1.3864 | 2.583** |
| 12-month | –1.2255 | –2.005 | .9011 | 1.507 |

*Notes:* ** significant at 5% level.
* significant at 10% level.
This table shows the cumulative abnormal returns for portfolios of winner and loser stocks at the time when their current stock price is lower than their 52-week low for different investment holding periods (i.e., 3 days, 1 week, 2 weeks, 3 weeks, 1 month, 3 months, 6 months, and 12 months).

## CONCLUSION AND IMPLICATIONS

There are four main findings of this study. Firstly, it is found that Malaysian investors are attention driven. Their trading behaviour is biased toward attention-grabbing events (i.e., daily extreme price changes). Secondly, investors' judgement exhibits reference dependence. They use the 52-week high and 52-week low as reference points in making their trading decisions. Thirdly, attention-based strategy does not generate positive abnormal returns except for the strategy of buying portfolios consisting of loser stocks. Fourthly, both the 52-week high and the 52-week low affect stock returns. Portfolios whose current stock price rises above (or fall below) its 52-week high (or 52-week low) at the date of formulation tend to underperform (or outperform) the market in the subsequent period. The results of this study have some implications for financial theories. Investors are irrational. The psychological attributes of investors tend to

cause excessive trading in the market. This could provide a serious challenge to the rationality assumption of the EMH. Attention-based strategies, especially those of buying portfolios of loser stocks, yield positive abnormal returns in the short-run, but the promising returns automatically disappear in the longer horizon. Therefore, we conclude that the Malaysian market remains efficient in the long run.

## LIMITATIONS AND FUTURE RESEARCH

This study has some limitations. First, we are unable to obtain daily buy and sell orders, as Bursa Malaysia does not have the database to keep track of its daily transactions. We believe that if this study were to examine the order imbalance with daily buy and sell orders following the attention-grabbing event, it could provide a more in-depth understanding of the impact of investors' psychological biases on their trading behaviour. Secondly, the dataset used is only up to the year 2004, which is a bit out dated. From 2005 to 2009, market enthusiasm is tempered by the massive financial crisis in the US and Europe. The subprime mortgage crisis and global economic recession have had a downward impact on investor sentiment. Therefore, even if this study uses data up to 2009, it may not be able to detect abnormal trading volume surrounding the attention-grabbing event due to the low investor confidence attributable to other external factors.

This paper used event study to examine whether investors are attention driven and whether investors' judgement exhibits reference dependence. A field study focusing on gathering information directly from individual investors at stock broking firms and examining daily order imbalances with the use of daily buy and sell orders may be able to shed more light on the investors' buying behaviour and its impact on stock price movements.

## REFERENCES

Barber, B. M., & Odean, T. (2003). *All that glitters: The effect of attention and news on the buying behaviour of individual and institutional investors* (Working Paper). Berkeley: University of California.

Brown, S. J., & Warner, J. B. (1985). Using daily stock returns: The case of event studies. *Journal of Financial Economics*, *14*(1), 3–31.

Brown, S. J., & Warner, J. B. (1980). Measuring security price performance. *Journal of Financial Economics*, *8*(3), 205–258.

Core, J., & Guay, W. (2001). Stock option plans for non-executive employees. *Journal of Financial Economics*, *61*, 253–287.

Corrado, C. J. (1989). A nonparametric test for abnormal security-price performance in event studies. *Journal of Financial Economics*, *23*(2), 385–395.

Cowan, A. R. (1992). Nonparametric event study tests. *Review of Quantitative Finance and Accounting*, *2*, 343–358.

Cowan, A. R., Nayar, N., & Singh, A. K. (1990). Stock returns before and after calls of convertible bonds. *Journal of Financial and Quantitative Analysis*, *25*, 549–554.

Cowan, A. R., & Sergeant, A. M. A. (1996). Trading frequency and event study test specification. *Journal of Banking & Finance*, *20*(10), 1731–1757.

DeBondt, W., & Thaler, R. H. (1985). Does the stock market overract? *Journal of Finance*, *40*(3), 793–805.

Fama, E. (1998). Market efficiency, long-term returns, and behavioural finance. *Journal of Financial Economics*, *49*(3), 283–306.

Ferris, S. P., Haugen, R. A., & Makhija, A. K. (1988). Predicting contemporary volume with historic volume at differential price levels: Evidence supporting the disposition effect. *Journal of Finance*, *43*(3), 677–697.

Gervais, S., Kaniel, R., & Mingelgrin, D. (2001). High-volume return premium. *Journal of Finance*, *56*, 877–919.

Gneezy, U. (1998). *Updating the reference level: Experimental evidence* (Working Paper). Israel: University of Haifa.

Graham, B., & Dodd, D. L. (1965). The intelligent investor. NY: Harper and Row

Grinblatt, M., & Keloharju, M. (2000), The investment behaviour and performance of various investor types: A study of finland's unique data set. *Journal of Financial Economics*, *55*, 43–67.

Hand, J. R. (1990), A test of the extended functional fixation hypothesis. *The Accounting Review*, *65*(4), 740–763.

Heath, C., Huddart, S., & Lang, M. (1999). Psychological factors and stock option exercise. *Quarterly Journal of Economics*, *114*(2), 601–627.

Huddart, S., & Lang, M. (2002). Information distribution within firms: Evidence from stock option exercises. Manuscript submitted for publication.

Huddart, S., & Yetman, M. (2002). *Psychological factors, stock price paths, and trading volume* (Working Paper). US: Pennsylvania State University.

Jarrell, G. A., & Poulsen, A. B. (1988). Dual Class recapitalization as antitakeover mechanism: The recent evidence. *Journal of Financial Economics*, *20*(1&2), 129–152.

Kahneman, D., & Riepe, M. (1998). Aspects of investor psychology. *Journal of Portfolio Management*, *24*, 52–65.

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, *47*(2), 263–292.

Lee, C., Shleifer, A., & Thaler, R. (1991). Investor sentiment and the closed-end fund puzzle. *Journal of Finance*, *46*(1), 75–109.

Mayshar, J. (1983). On divergence of opinion and imperfections in capital markets. *American Economic Review*, *73*(1), 114–128.

McWilliams, V. B. (1990). Managerial share ownership and the stock price effects of antitakeover amendment proposals. *Journal of Finance*, *45*(5), 1627–1640.

Miller, E. M. (1977). Risk, uncertainty and divergence of opinion. *Journal of Finance*, *32*(4), 1151–1168.

Md. Isa & Lim (1995). Profile of individual investors in the Klang Valley area. *Capital Markets Review*, *3*(1), 1–15.

Nofsinger, J. R. (2002). The psychology of investing. Washington State University: Prentice Hall.

Odean, T. (1999). Do investors trade too much ? *Journal of Finance*, *53*, 1775–1779.

Oehler, A., Heilmann, K., Lager, V., & Oberlander, M. (2002). *Dying out or dying hard? Disposition investors in stock markets* (Working Paper). Bamberg University. Retrieved March 25, 2003, from http://www.departments. bucknell.edu/ management/apfa/Hamburg%20Papers/Oehler.pdf

Poteshman, A., & Serbin, V. (2001). Clearly irrational financial market behaviour: Evidence from the early exercise of exchange traded stock options (Working paper). Urbana: University of Illinois.

Sanger, G. C., & Peterson, J. D. (1990). An empirical analysis of common stock delistings. *Journal of Financial and Quantitative Analysis*, *25*(2), 261–272.

Schmidt, U., & Zank, H. (2007). Linear cumulative prospect theory with applications to portfolio selection and insurance demand. *Decisions in Economics and Finance*, *30*(1), 1–18.

Shefrin, H., & Statman, M. (1985). The disposition to sell winners too early and ride losers too long: Theory and evidence. *Journal of Finance*, *40*(3), 777–790.

Shleifer, A (2000). *Inefficient markets: An introduction to behavioural finance*. UK: Oxford Publishing.

Toh, G. G., & Ahmad, Z. (2007). Are Malaysian investors attention-driven? *Proceeding of the 9th Annual Malaysian Finance Association Conference*. Shah Alam, Malaysia.

Tversky, A., & Kahneman, D. (1992). Advances in prospect theory: Cumulative representation of uncertainty. *Journal of Risk and Uncertainty*, *5*, 297–323.

Von Neumann, J., & Morgenstern, O. (1944). Theory of games and economic behavior. NJ: Princeton University Press.

Yantis, S. (1998). Control of visual attention. In Pashler, H. (Ed), Attention East Sussex. UK: Psychology Press.