

## Size, Seasonality, Market States and Contrarian Profits

(Saiz, Seasonaliti, Keadaan Pasaran dan Keuntungan Kontrarian)

Si-Roei Kew

Lain-Tze Tee

(Faculty of Economics and Management, Universiti Kebangsaan Malaysia)

### ABSTRACT

*The study investigates the profitability of contrarian and momentum strategies for short, intermediate and long investment horizons in the Malaysian stock market from 1990-2016. Unlike developed markets, the findings reveal that momentum strategies do not generate profits in Malaysia. Rather, contrarian strategies realise significant returns over short, intermediate and long investment horizons. Contrarian profits are most pronounced among medium- and small-capitalisation stocks. Moreover, the previously documented February/Chinese New Year effect is evident in contrarian profits. Further, market states are important determinants of contrarian profits. Specifically, contrarian returns are greater following market downturns than market upturns. The findings provide important implications for investors who are considering momentum and contrarian strategies as potential investments.*

*Keywords: Contrarian strategies; momentum strategies; firm size; monthly seasonality; market states*

### ABSTRAK

*Kajian ini mengkaji keuntungan strategi momentum dan kontrarian dalam tempoh pelaburan jangka masa pendek, sederhana dan panjang di pasaran saham Malaysia dari tahun 1990-2016. Tidak seperti negara-negara maju, hasil kajian menunjukkan bahawa strategi momentum tidak menjana keuntungan di Malaysia. Sebaliknya, strategi kontrarian menghasilkan keuntungan yang signifikan dalam tempoh pelaburan jangka masa pendek, sederhana dan panjang. Keuntungan strategi kontrarian adalah paling tinggi di kalangan saham-saham bersaiz kecil dan sederhana. Selain itu, keuntungan kontrarian yang tinggi diperolehi pada bulan Februari/Tahun Baru Cina. Tambahan pula, keadaan pasaran merupakan faktor utama keuntungan kontrarian. Secara khususnya, pulangan kontrarian adalah lebih tinggi berikutan kemerosotan pasaran berbanding dengan pertumbuhan pasaran. Hasil kajian ini memberikan implikasi yang penting kepada pelabur yang sedang mempertimbangkan strategi kontrarian dan momentum sebagai pilihan pelaburan yang berpotensi.*

*Kata kunci: Strategi kontrarian; strategi momentum; saiz firma; seasonaliti bulanan; keadaan pasaran*

### INTRODUCTION

Stock trading strategies based on past returns over short-, intermediate- and long-term horizons have been widely examined. Specifically, Jegadeesh (1990) and Lehmann (1990) find return reversals over very short horizons whereby buying past one month losers and selling past one month winners yield profits in the following month. Conversely, Jegadeesh and Titman (1993, 2001) find that an intermediate-term momentum strategy of buying past winners and selling past losers generates significant profits because returns continue over intermediate horizons of three to 12 months. However, De Bondt and Thaler (1985, 1987) demonstrate that a long-term contrarian strategy permits investors to exploit profits because long-term past loser portfolios exhibit superior performance to long-term past winner portfolios over the subsequent three to five years.

The purpose of this study is to investigate the profitability of contrarian and momentum investing over several formation and investment periods – namely short, intermediate and long horizons – in the Malaysian stock market from 1990 to 2016. The Malaysian stock market

provides several motivating features for examining the performance of contrarian and momentum strategies. First, it is dominated by small- and micro-capitalisation stocks, and it is well documented that small stocks tend to generate greater momentum and contrarian profits than large stocks (Hong, Lim & Stein 2000; Zarowin 1990). Second, financial analysts' coverage of Malaysian stocks is relatively low, and it is reported that the momentum effect is prominent for firms with less analysts' coverage (Hong et al. 2000). Third, Malaysia is a less individualistic culture compared to developed markets. Daniel, Hirshleifer and Subrahmanyam (1998) and Chui, Titman and Wei (2010) show that market participants in less individualistic cultures tend to slowly update their beliefs about the value of a stock; they suffer less from self-attribution bias and have lower confidence and thus they are disinclined to adopt momentum strategies. In summary, the dominance of small stocks and the low level of analyst coverage may be expected to result in contrarian and momentum strategies being successful in the Malaysian market, while the nature of Malaysian culture may not be expected to result in the momentum strategy being successful.

## LITERATURE REVIEW

Hong et al. (2000) report that investors earn profits by implementing momentum strategies among small- and medium-capitalisation firms. The authors argue that smaller stocks, which are less monitored and have gradual information dissemination, may exhibit more pronounced momentum than larger stocks. Further, Zarowin (1990) and Lee et al. (2003) find that the outperformance of loser stocks to winner stocks is related to the firm size effect. The authors document strong evidence of a contrarian effect for small-capitalisation stocks, but the evidence is comparatively weak for large-capitalisation stocks.

A growing body of literature has documented seasonal effects in reversal and momentum profits. For example, De Bondt and Thaler (1985, 1987), Jegadeesh (1990), Zarowin (1990) and Yao (2012) document that contrarian returns are concentrated in January in the US market. Jegadeesh and Titman (1993, 2001) also report that large momentum profits are concentrated in November and December, while contrarian profits occur in January. This finding is in accordance with the tax-loss selling conjecture that market participants sell loser stocks that have performed poorly to realise tax deductible losses at the end of the financial year. However, Yong (1989) reported the absence of January effect in the Malaysian stock market. There is no capital gains tax for equities in Malaysia and thus, the tax-loss selling argument should not apply to the Malaysian market (Ho 1990). Inconsistent with the results for developed markets, Ahmad and Hussain (2001) provide evidence of long-term contrarian strategy in Malaysia exhibits large returns in February rather than January, and they relate this finding to the presence of the Chinese New Year (CNY), which usually occurs in February. The CNY is celebrated on a grand scale not only by the Chinese, who are dominant investors,<sup>1</sup> but also by other ethnic groups in Malaysia. Chinese families give red envelopes containing cash as a form of blessing to junior members of the family, and companies also give year-end bonuses in red packets to employees. Market participants invest part of this transitory income in stocks during CNY, which may contribute to higher returns in February. In Western markets, the contrarian effect is generally more prevalent around the turn-of-the-year – that is, the first month of the Western calendar, or January. It is likely that the CNY in February, which is the first month of the Chinese calendar, is accountable for a similar turn-of-the-year effect on the Malaysian market.

Further, numerous studies have highlighted that contrarian and momentum profits are explained by economic states (Cooper, Gutierrez & Hameed 2004; Stivers & Sun, 2013; Daniel & Moskowitz, 2016; Lin et al. 2016). Chordia and Shivakumar (2002) find that momentum strategies provide positive returns during good economic conditions, but negative returns during poor economic conditions. Similarly, Cooper et al. (2004) and Daniel and Moskowitz (2016) report that momentum

payoffs are positive following positive market returns, but negative following negative market returns.

The extant evidence on contrarian and momentum returns in the Malaysian stock market is mixed. Hameed and Ting (2000) investigate the profitability of short-horizon contrarian strategies using weekly returns for 663 Malaysian stocks over the period 1977 to 1996. They find that contrarian strategies produce significant profits in the first week after the formation period, but they become insignificant in the subsequent three weeks. A study by Ahmad and Hussain (2001) examines six non-overlapping samples from 1986 to 1996 for 166 listed stocks on the Kuala Lumpur Stock Exchange, rather than overlapping samples on both listed and delisted stocks. The authors provide evidence of potential profits from long-horizon contrarian strategies. Specifically, they find that extreme losers and winners over a three-year horizon exhibit a reversal of their performance in the following three years. However, these earlier Malaysian studies use pre-1997 data and are thus outdated. Further, Hameed and Kusnadi (2002) study intermediate-term momentum effects in six Asian markets, including 244 Malaysian firms, from 1981 to 1994. They conclude that the Malaysian stock market generates positive but statistically insignificant momentum returns. In an international study, Griffin, Kelly and Nardari (2010) also find that momentum strategies yield insignificant negative returns in Malaysia over the period January 1994 to October 2005. These Asian and international studies are limited in depth and scope.

This study differs from the extant literature on trading strategies in several ways. First, earlier Malaysian studies have focused solely on either a short-run contrarian strategy, an intermediate-run momentum strategy or a long-run contrarian strategy. However, different formation and investment periods may affect the portfolio that a stock is sorted into, as well as the holding returns of the loser and winner portfolios. Thus, this study captures the time-series behaviour of both contrarian and momentum strategies over a range of formation and holding periods—namely, short- (one month), medium- (three, six, nine and 12 months) and long-horizon (two to five years) periods. Second, this study covers a longer period, thereby enabling an examination of the performance of contrarian and momentum strategies in different market states. Third, earlier Malaysian studies examine stocks that are listed at the end of their sample period. Ignoring delisted stocks tends to introduce survivorship bias, which adversely affects the actual returns of investment strategies. This study thus includes both listed and delisted stocks traded on the Malaysian stock market in order to minimise survivorship bias. Fourth, no prior studies have comprehensively investigated whether contrarian and momentum profits can be attributable to factors such as firm size, monthly seasonality and market states in the context of the Malaysian stock market. Consequently, the findings of this study have significant implications for investors regarding the practical execution of contrarian and momentum strategies in the emerging stock market.

## DATA

This study examines all listed and delisted stocks on the Malaysian stock market for the period 1990 to 2016. The data for adjusted stock prices for capital changes, returns on the Kuala Lumpur Composite Index (KLCI) and market capitalisations are obtained from Datastream. This study restricts the sample selection to stocks with a primary quotation and major security; thus, foreign listings and multiple share types of a stock are excluded. The final dataset consists of 1,218 common equities, of which 883 firms remain listed, while 335 firms are delisted at the end of the sample period.

Several screening procedures by Jegadeesh and Titman (2001) and Griffin et al. (2010) are used in this study. Equity returns that are higher (less) than 200% (-200%) are excluded to avoid pricing errors. Further, each month, the bottom decile of equities based on market capitalisation is also removed to reduce the problem of non-synchronised trading induced by illiquid equities and small equities.

## METHODOLOGY

This study examines the profitability of contrarian and momentum strategies in the Malaysian market over different formations ( $f$ ) and holding ( $h$ ) horizons – namely, a short horizon (one month), intermediate horizons (three, six, nine and 12 months) and long horizons (2–5 years).

Following Lo and MacKinlay (1990) and Jegadeesh and Titman (1993), this study begins by calculating continuously compounded returns over formation period,  $f$ , for all stocks. All stocks are then ranked in ascending order based on their past cumulative returns. To be eligible for ranking, a stock must have a full return history from the beginning to the end of the formation month. This restriction is applied to ensure that the stock trades at the end of the formation period, and hence the stock portfolio, is investible.

Next, stocks are sorted into quintiles. Stocks with the highest returns in the top quintile are assigned to the winner portfolio (P5), while those with the lowest returns in the bottom quintile are placed into the loser portfolio (P1). Given that the Malaysian stock market has a smaller number of stocks relative to the US market, quintiles are formed rather than deciles. The analysis is also replicated using deciles.<sup>2</sup>

Each portfolio is held for various holding periods subsequent to the formation month. Following Chan, Jegadeesh and Lakonishok (1996), if a stock is delisted during the holding period, its return is replaced with the market return until the end of the holding period. The average return on a zero-investment portfolio, involving a long position in the loser portfolio and a short position in the winner portfolio, is calculated. If the return of the loser-minus-winner portfolio (P1-P5) is statistically significantly positive, contrarian profits are present. If it is

statistically significantly negative, then momentum profits exist. Otherwise, neither strategy generates profits.

To control for bid–ask bounce and lead–lag effects, which may distort the performance of a trading strategy, a one-month gap between the portfolio formation period and the holding period is introduced. Further, overlapping portfolios are constructed to increase the power of the test. For example, the monthly return for a three-month holding period is the result of an equal-weighted average of portfolio returns from the strategies of the current month, the previous month and the past two months.

In addition, to examine the relationship between firm size and contrarian and momentum profits, portfolios are formed based on a two-way sort between past stock returns and past market capitalisation. At the beginning of each month, all stocks are ranked in ascending order based on their past formation month returns and then divided into quintile portfolios. P1 (P5) represents the loser (winner) portfolio with the lowest (highest) returns. These stocks are then subdivided into three size portfolios based on their market capitalisations. S, M and L represent the small-capitalisation portfolio (bottom 30%), the medium-capitalisation portfolio (medium 40%) and the large-capitalisation portfolio (top 30%), respectively. All portfolios are held for  $h$  months. The stocks at the intersection of the two sorts are grouped together to create portfolios based on past returns and past market capitalisation.

This study also examines seasonal patterns in the performance of the contrarian and momentum portfolios with specific attention to the February/CNY effect. A methodology analogous to Jegadeesh and Titman (1993), Ahmad and Hussain (2001) and Yao (2012) is adopted. Specifically, the average February return is compared with the average non-February return for each trading strategy. Intuitively, if contrarian profits are attributed to the CNY effect, then contrarian profits in February should be statistically higher than the average non-February return.

Furthermore, this study tests whether the profitability of contrarian and momentum strategies is related to market conditions. Following Cooper et al. (2004), the market states are classified into two groups based on returns on the KLCI over month  $t-T$  to  $t-1$ , where  $T$  denotes 12 months, 24 months and 36 months. The up (down) market state is when the market returns in the month  $t-T$  leading up to month  $t-1$  are non-negative (negative). The average monthly returns for contrarian and momentum strategies following up and down market states are estimated. The time-series of average portfolio returns are regressed on an UP dummy variable and a DOWN dummy variable with no intercept, as described in Equation (1). To examine whether the portfolio returns following up and down markets are equal, the model estimates the time-series regressions of average portfolio returns on an intercept and an UP dummy variable, as presented in Equation (2).

$$r_{pt} = \beta_1 UP_t + \beta_2 DOWN_t + \varepsilon_t \quad (1)$$

$$r_{pt} = \alpha_t + \lambda_1 UP_t + \varepsilon_t \quad (2)$$

where  $r_p$  is portfolio returns; UP (DOWN) is a dummy variable that takes the value of one for the up (down) market state and zero otherwise. The coefficients,  $\beta_1$  and  $\beta_2$ , represent the returns following an up market and a down market, respectively. The intercept,  $\alpha_t$ , indicates the returns following the non-up market, while the dummy slope,  $\lambda_1$ , captures the profit difference between the up and down market states.  $\varepsilon_t$  is the error term.

## RESULTS AND DISCUSSION

### PROFITABILITY OF CONTRARIAN AND MOMENTUM STRATEGIES

Table 1 reports the average monthly returns for the loser portfolio (P1), the winner portfolio (P5) and the contrarian/momentum strategies (P1-P5) for various symmetrical combinations of portfolio formation and investment periods ( $f = h$ ). The results confirm the prevalence of short-term contrarian profits, as evidenced by Jegadeesh (1990). Specifically, with a one-month portfolio formation period and a one-month holding period ( $f/h = 1$ -month), past losers yield a statistically significant average return of 1.65% per month, whereas past winners gain an average return of 0.55% per month. Thus, an investor purchasing the past month loser stocks and short-selling the past months winner stocks make a profit of 1.10% per month with a  $t$ -statistic of 3.76. This result is consistent with the evidence of Griffin et al. (2010) and Hameed and Ting (2000) in finding short-term contrarian profits in the Malaysian stock market.

However, momentum profits do not exist in the Malaysian stock market. This is inconsistent with the literature, which shows that momentum strategies work over intermediate horizons of three to 12 months (i.e., Jegadeesh & Titman 1993, 2001; Foster & Kharazi 2008; Yao 2012; Doan, Alexeev & Brooks 2014). Instead, statistically significant contrarian profits arise for the

strategy that ranks stocks over the past 12 months and then holds the portfolio for the next 12 months ( $f/h = 12$ -month). In Malaysia, on average, the winners (losers) over the previous 12-month period become the losers (winners) over intermediate-term holding periods.

In addition, the results show that contrarian profits exist when the formation period and the holding period are extended to long horizons of 24 to 60 months. The finding that stocks with low long-term past returns tend to outperform stocks with high long-term past returns is consistent with the finding of De Bondt and Thaler (1985). Over long horizons, investors can earn statistically significant profits ranging from 0.41% to 0.66% per month using contrarian strategies. For example, a contrarian investment strategy that ranks stocks over the past 24 months and then holds the portfolio for the next 24 months ( $f/h = 24$  months) generates the highest return of 0.66% per month. In comparison, a contrarian investment strategy involving  $f/h = 60$  months generates the lowest return of 0.41% per month.

### SIZE EFFECT AND THE PROFITABILITY OF TRADING STRATEGIES

The relationship between firm size and contrarian and momentum profits are examined. Table 2 reports average monthly percentage returns of contrarian and momentum portfolios sorted on size over various symmetrical combinations of portfolio formation and investment periods ( $f = h$ ). As shown, contrarian profits increase monotonically as firm size decreases. This result is inconsistent with that of De Bondt and Thaler (1987), who find that firm size does not influence contrarian profits, but it is consistent with Zarowin (1990) and Lee et al. (2003), who observe an inverse relationship between contrarian profits and firm size. Significant contrarian profits are found for the majority of the small- and medium-size portfolios. For instance, the 24-month contrarian strategy yields an average monthly return of 0.87% (with a  $t$ -statistic of 3.54)

TABLE 1. Returns of contrarian and momentum portfolios

Portfolio	$f/h = 1$	3	6	9	12	24	36	48	60
P1	1.65*** (2.86)	0.86 (1.42)	0.83 (1.32)	1.06 (1.52)	1.09* (1.70)	1.19* (1.85)	1.14* (1.76)	0.85 (1.38)	0.75 (1.28)
P5	0.55 (0.99)	0.89* (1.78)	0.87* (1.76)	0.78 (1.48)	0.58 (1.20)	0.54 (1.07)	0.61 (1.16)	0.34 (0.61)	0.33 (0.60)
P1-P5	1.10*** (3.76)	-0.03 (-0.12)	-0.04 (-0.14)	0.28 (0.87)	0.51* (1.64)	0.66** (2.43)	0.53** (2.12)	0.51** (2.15)	0.41* (1.76)

Note: This table presents average monthly returns in percentages for contrarian and momentum strategies based on various  $f$ -month formation periods and  $h$ -month holding periods. At the beginning of each month, stocks listed on the Malaysian stock market are sorted in ascending order based on their past formation ( $f$ ) month returns and divided into five equal-weighted portfolios. P1 represents the loser portfolio with the lowest returns, and P5 represents the winner portfolio with the highest returns. The zero-cost contrarian strategy buys the loser portfolios and sells the winner portfolios, whereas the momentum strategy buys the winners and sells the losers. The portfolios are held for  $h$  months. To increase the power of the tests, overlapping portfolios are constructed. There is a one-month gap between the portfolio formation period and the holding period. All  $t$ -statistics are reported in parentheses. \*\*\*, \*\* and \* denote statistical significance at the 1, 5 and 10% levels.

TABLE 2. Returns of contrarian and momentum portfolios sorted on size

Portfolio	$f/h = 1$	3	6	9	12	24	36	48	60
<i>Large-capitalisation firms</i>									
P1	0.30 (0.57)	0.22 (0.37)	0.27 (0.44)	0.49 (0.79)	0.73 (1.18)	0.90 (1.41)	0.86 (1.37)	0.64 (1.08)	0.64 (1.11)
P5	0.77 (1.47)	0.64 (1.40)	0.62 (1.33)	0.48 (1.01)	0.44 (0.91)	0.48 (1.00)	0.63 (1.22)	0.45 (0.81)	0.50 (0.85)
P1-P5	-0.47 (-1.40)	-0.42 (-1.19)	-0.35 (-0.94)	0.01 (0.03)	0.30 (0.83)	0.42 (1.27)	0.24 (0.78)	0.19 (0.62)	0.14 (0.45)
<i>Medium-capitalisation firms</i>									
P1	1.39** (2.22)	0.41 (0.67)	0.59 (0.91)	0.83 (1.23)	0.99 (1.47)	1.13* (1.73)	1.08* (1.66)	0.85 (1.41)	0.76 (1.32)
P5	0.62 (1.02)	0.85 (1.60)	0.75 (1.51)	0.55 (1.11)	0.49 (0.99)	0.44 (0.86)	0.54 (1.03)	0.29 (0.51)	0.21 (0.40)
P1-P5	0.77** (2.09)	-0.44 (-1.32)	-0.16 (-0.48)	0.28 (0.78)	0.49 (1.38)	0.69** (2.29)	0.54* (1.94)	0.56** (2.09)	0.55** (2.01)
<i>Small-capitalisation firms</i>									
P1	3.11*** (4.87)	1.66*** (2.59)	1.36** (2.08)	1.51** (2.32)	1.56** (2.36)	1.56** (2.29)	1.50** (2.13)	1.06 (1.57)	0.84 (1.34)
P5	0.19 (0.30)	0.80 (1.37)	0.96* (1.68)	0.94* (1.73)	0.81 (1.54)	0.69 (1.25)	0.67 (1.17)	0.27 (0.47)	0.27 (0.48)
P1-P5	2.92*** (8.76)	0.86*** (3.02)	0.41 (1.39)	0.58** (2.04)	0.75*** (2.61)	0.87*** (3.54)	0.83*** (3.30)	0.79*** (3.31)	0.57*** (2.60)

Note: This table presents average monthly returns in percentages for contrarian and momentum strategies based on past returns and past market capitalisation. The same combinations of formation and holding months ( $f/h$ ) are reported. If the return of the loser-minus-winner portfolio is statistically significantly positive (negative), it shows the presence of contrarian (momentum) profits. All  $t$ -statistics are reported in parentheses. \*\*\*, \*\* and \* denote statistical significance at the 1, 5 and 10% levels.

for small stocks and 0.69% (with a  $t$ -statistic of 2.29) for medium stocks. However, the strategy is unprofitable for large firms, which yield a statistically insignificant return of 0.42% per month. Similar results are obtained for almost all other formation/holding periods. Therefore, the results infer that the performance of contrarian strategies is inversely related to firm size.

#### MONTHLY SEASONALITY AND THE PROFITABILITY OF TRADING STRATEGIES

This section examines seasonal patterns in contrarian and momentum profits. Average monthly returns in February and non-February months for the contrarian and momentum strategies across symmetric formation and holding periods are reported in Table 3. The results show that profits for all samples are positive and significantly different from zero in February for the one-month contrarian strategy. For the intermediate horizons, contrarian profits for all samples are found in February for all strategies but the six-month period. All the long-term contrarian strategies generate positive contrarian returns in February. By comparison, the average non-February return for all samples is positive and statistically significant for only the one-, 24- and 36-month contrarian strategies.

The results of equality of returns between February and non-February provide evidence that the contrarian strategy consistently yields a higher average return in February than in non-February. For the 12-month

contrarian strategy, the February return (1.66%) is statistically significantly greater than the non-February return (0.40%) for all samples. A similar return differential is observed for several three-, nine-, 48- and 60-month contrarian strategies. This result is consistent with the CNY effect and supports the findings of Ahmad and Hussain (2001), in which the CNY effect is present in long-run return reversals in the Malaysian stock market.

Further, this study investigates whether the February/CNY effect is related to firm size. Contrarian returns in February are significantly higher than returns in non-February months for large-, medium- and small-capitalisation firms. In examining the equality of returns between February and non-February, the results – that the contrarian strategy generates higher profits in February than in non-February – are robust to all three size samples. Therefore, the relation between contrarian profits and the February effect is not driven by firm size. This finding is inconsistent with that of Ahmad and Hussain (2001), who find that the February return differential is more pronounced for small-capitalisation stocks than for large-capitalisation stocks.

#### MARKET STATES AND THE PROFITABILITY OF TRADING STRATEGIES

This section explores whether the profits of contrarian and momentum strategies are market-state dependent. Table 4 reports average monthly returns for contrarian

TABLE 3. Seasonal patterns in contrarian and momentum profits

	<i>f/h</i> = 1	3	6	9	12	24	36	48	60
<i>All sample</i>									
February	2.87** (2.37)	2.08** (2.40)	1.17 (1.47)	1.58** (2.25)	1.66*** (2.85)	1.03* (1.86)	1.23** (2.50)	1.62*** (3.94)	1.67*** (3.16)
Non-February	0.89*** (3.53)	-0.18 (-0.58)	-0.15 (-0.43)	0.17 (0.50)	0.40 (1.20)	0.62** (2.04)	0.47* (1.70)	0.40 (1.62)	0.30 (1.21)
Difference	1.97 (1.63)	2.26** (2.45)	1.31 (1.50)	1.41* (1.74)	1.25* (1.78)	0.41 (0.61)	0.77 (1.25)	1.22** (2.43)	1.37** (2.27)
<i>Large-capitalisation firms</i>									
February	2.09* (1.92)	1.85** (2.23)	1.71** (2.14)	1.82** (2.35)	1.82*** (3.11)	0.83 (1.40)	1.10** (2.01)	1.42** (2.54)	1.48* (1.91)
Non-February	-0.71** (-2.24)	-0.62 (-1.59)	-0.53 (-1.36)	-0.15 (-0.39)	0.16 (0.40)	0.38 (1.06)	0.16 (0.48)	0.07 (0.24)	0.02 (0.05)
Difference	2.80** (2.47)	2.47*** (2.62)	2.24** (2.43)	1.97** (2.19)	1.67** (2.26)	0.46 (0.62)	0.94 (1.32)	1.35* (1.95)	1.46* (1.68)
<i>Medium-capitalisation firms</i>									
February	2.40* (1.64)	1.82* (1.65)	1.31 (1.33)	1.49* (1.72)	1.20 (1.57)	1.02 (1.44)	1.06** (2.01)	1.54*** (2.87)	1.85*** (3.15)
Non-February	0.62* (1.92)	-0.64* (-1.95)	-0.29 (-0.82)	0.17 (0.44)	0.43 (1.11)	0.66* (1.93)	0.49* (1.64)	0.47* (1.68)	0.43 (1.51)
Difference	1.78 (1.21)	2.46** (2.19)	1.61 (1.50)	1.33 (1.36)	0.77 (0.87)	0.36 (0.45)	0.57 (0.89)	1.07* (1.76)	1.42** (2.14)
<i>Small-capitalisation firms</i>									
February	4.13** (2.57)	2.57*** (2.68)	0.46 (0.53)	1.42** (1.97)	1.94*** (2.79)	1.24* (1.90)	1.53** (2.46)	1.92*** (3.86)	1.68*** (3.08)
Non-February	2.81*** (7.27)	0.71** (2.25)	0.40 (1.21)	0.50* (1.74)	0.63** (2.16)	0.83*** (2.97)	0.76*** (2.70)	0.68*** (2.59)	0.46** (2.03)
Difference	1.32 (0.86)	1.86* (1.87)	0.05 (0.06)	0.92 (1.14)	1.30* (1.66)	0.41 (0.54)	0.77 (1.04)	1.24** (2.21)	1.22** (2.04)

Note: This table presents average monthly returns in percentages for contrarian and momentum portfolios in February and non-February months. The same combinations of formation and holding months (*f/h*) are reported. If the return of the loser-minus-winner portfolio is statistically significantly positive (negative), it shows the presence of contrarian (momentum) profits. February indicates that the investment period includes only February. Non-February indicates that the investment period is months outside of February. Difference refers to the results of the test for the equality of returns between February and non-February. All *t*-statistics adjusted for heteroscedasticity and autocorrelation are reported in parentheses. \*\*\*, \*\* and \* denote statistical significance at the 1, 5 and 10% levels.

and momentum portfolios over various symmetrical combinations of portfolio formation and investment periods under two market conditions. Up and down markets are determined by the lagged 12-month market return. This study also replicates the test using market returns over lagged 24 and 36 months to define the market states, and the results hold. The result shows that three- and six-month momentum strategies generate statistically significant profits of 0.61% and 0.51% following up market states. The finding is consistent with those of Cooper et al. (2004), who observe that the average monthly momentum profit is 0.93% following times of increasing market in the US market. Investor overconfidence, which is higher following up markets, boosts overreactions to information and hence generates greater momentum.

Conversely, contrarian strategies yield significant positive profits over the short, intermediate, and long terms following down market states. More specifically, following a market downturn, most strategies going long on past loser stocks and short on past winner stocks generate statistically significant returns, with average

returns ranging from 53 to 221 basis points per month. The findings are consistent with Du, Huang and Liao (2009) who find contrarian profits following down markets in Taiwan. The results suggest that down market states diminish the investors' overconfidence level and increase their risk aversion level. Consequently, stock price continuation is weak and stock return reversals occur swiftly.

The results for testing the equality of contrarian returns across market states show that the profit differences between the up and down market states are negative for all formation/holding periods, suggesting that contrarian profits following down market states are higher than those following up market states. More specifically, contrarian strategies can generate 1.29% to 1.70% higher returns following down states compared to up states.

We also examine the link between firm size and contrarian and momentum portfolio following up and down markets. We find that large- and medium-capitalisation firms generate statistically intermediate-term momentum profits following up market. Conversely,

TABLE 4. Returns of contrarian and momentum portfolios across market states

	<i>f/h</i> = 1	3	6	9	12	24	36	48	60
<i>All sample</i>									
Up	0.52*	-0.61**	-0.51*	-0.19	0.07	0.61*	0.51	0.49	0.38
	(1.87)	(-2.52)	(-1.94)	(-0.73)	(0.25)	(1.76)	(1.56)	(1.62)	(1.22)
Down	2.21***	1.06	0.86	1.19	1.36*	0.74*	0.58*	0.53*	0.48
	(4.17)	(1.55)	(1.15)	(1.63)	(1.92)	(1.77)	(1.71)	(1.66)	(1.58)
Up-Down	-1.70***	-1.67**	-1.38*	-1.38*	-1.29*	-0.13	-0.07	-0.04	-0.10
	(-2.80)	(-2.30)	(-1.72)	(-1.76)	(-1.67)	(-0.24)	(-0.15)	(-0.10)	(-0.24)
<i>Large-capitalisation firms</i>									
Up	-0.62*	-0.96***	-0.81***	-0.55*	-0.18	0.41	0.16	0.21	0.16
	(-1.90)	(-2.88)	(-2.73)	(-1.64)	(-0.51)	(1.05)	(0.44)	(0.61)	(0.43)
Down	-0.15	0.61	0.64	1.10	1.21	0.42	0.37	0.15	0.11
	(-0.24)	(0.78)	(0.75)	(1.37)	(1.57)	(0.80)	(0.84)	(0.31)	(0.22)
Up-Down	-0.47	-1.57*	-1.45	-1.65*	-1.39*	-0.01	-0.21	0.06	0.05
	(-0.66)	(-1.87)	(-1.60)	(-1.89)	(-1.64)	(-0.01)	(-0.36)	(0.10)	(0.08)
<i>Medium-capitalisation firms</i>									
Up	0.05	-1.00***	-0.56*	-0.14	0.07	0.64	0.55	0.47	0.53
	(0.13)	(-3.68)	(-1.90)	(-0.46)	(0.20)	(1.56)	(1.51)	(1.44)	(1.49)
Down	2.23***	0.48	0.52	1.03	1.31*	0.78*	0.54	0.71*	0.57*
	(3.56)	(0.65)	(0.65)	(1.24)	(1.68)	(1.79)	(1.37)	(1.77)	(1.64)
Up-Down	-2.18***	-1.48*	-1.08	-1.17	-1.25	-0.14	0.01	-0.24	-0.04
	(-2.89)	(-1.88)	(-1.25)	(-1.31)	(-1.43)	(-0.23)	(0.02)	(-0.47)	(-0.08)
<i>Small-capitalisation firms</i>									
Up	2.14***	0.14	0.16	0.13	0.32	0.79**	0.83**	0.76***	0.44
	(5.85)	(0.51)	(0.52)	(0.55)	(1.35)	(2.53)	(2.44)	(2.33)	(1.49)
Down	4.63***	2.11***	1.42**	1.43**	1.55**	1.02**	0.83**	0.80**	0.77***
	(5.45)	(3.30)	(2.21)	(2.35)	(2.48)	(2.44)	(2.57)	(2.66)	(3.07)
Up-Down	-2.50***	-1.97***	-1.59**	-1.31*	-1.23*	-0.23	0.00	-0.04	-0.33
	(-2.77)	(-2.83)	(-2.19)	(-1.95)	(-1.79)	(-0.45)	(0.00)	(-0.10)	(-0.88)

Note: This table presents average monthly returns in percentages for contrarian and momentum portfolios following up and down market states. The same combinations of formation and holding months (*f/h*) are reported. If the return of the loser-minus-winner portfolio is statistically significantly positive (negative), it shows the presence of contrarian (momentum) profits. Market is defined as up (down) if returns on the KLCI are positive (negative) over month  $t-12$  to  $t-1$ . Up-Down shows the test for the equality of profits between up and down market states. All  $t$ -statistics adjusted for heteroscedasticity and autocorrelation are reported in parentheses. \*\*\*, \*\* and \* denote statistical significance at the 1, 5 and 10% levels.

contrarian strategies are more profitable for medium- and small capitalisation firms compared to those generated for all sample following market downturns than following market upturns.

## CONCLUSION

This study examines the profitability of contrarian and momentum strategies in the Malaysian stock market over the period 1990 to 2016. Unlike the evidence of momentum profitability in developed markets, the Malaysian stock market does not exhibit a momentum effect. Instead, contrarian strategies that are long past loser stocks and short past winner stocks provide significant average positive monthly raw returns, ranging from 0.41% to 1.10% over the short, medium and long investment horizons.

This study shows that contrarian profits are inversely associated with firm size. Contrarian strategies tend to perform well among small- and medium-capitalisation stocks, but they are not effective in generating significant

returns among large-capitalisation stocks, regardless of the formation/holding period. Further, monthly seasonality in contrarian profits is also examined. The average contrarian profit in February is generally higher than the average contrarian profit in non-February months. The CNY usually falls in February; thus, the February effect may be primarily mirroring the CNY effect.

Additional evidence demonstrates that contrarian performance varies across market states. Contrarian investments following down market states generate greater returns than those following up market states. This is because the down markets dampen overconfidence, increase investors' risk aversion and result in stock return reversals.

The findings provide important implications for investors who are considering momentum and contrarian strategies as potential investments. The results suggest that in the absence of the transaction costs, investors are able to gain profits from the contrarian strategy. Investors should consider the factors such as firm size, seasonality and market states which affect the profitability of contrarian strategy.

## ENDNOTES

- <sup>1</sup> Chinese hold the highest percentage of equity ownership in Malaysia (38.9%), followed by foreigners (31.3%), Bumiputera or Malays (18.9%), nominee companies (8.5%), Indians (1.5%) and others (0.9%) (Economic Planning Unit, 2006).
- <sup>2</sup> The  $f/h = 1$ -month strategy generates returns of 1.73% per month with a t-statistic of 4.88, which is higher than the return of 1.10% per month with a t-statistic of 3.76, which is calculated using quintiles.

## ACKNOWLEDGEMENT

We are thankful to the Universiti Kebangsaan Malaysia for funding the study under the Young Researcher Encouragement Grant (Geran Galakan Penyelidik Muda, GGPM-2017-008).

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Si-Roei Kew (corresponding author)  
Faculty of Economics and Management  
Universiti Kebangsaan Malaysia  
43600 UKM Bangi, Selangor, MALAYSIA.  
E-Mail: srkew@ukm.edu.my

Lain-Tze Tee  
Faculty of Economics and Management  
Universiti Kebangsaan Malaysia  
43600 UKM Bangi, Selangor, MALAYSIA.  
E-Mail: jrtee@ukm.edu.my