

INTRA-SECTOR RETURN REVERSALS IN THE MALAYSIAN STOCK MARKET

Ruhani Ali ♣

Universiti Sains Malaysia

Zamri Ahmad

Universiti Sains Malaysia

Shangkari V. Anusakumar

Universiti Sains Malaysia

ABSTRACT

This paper examines return reversals in the Malaysian stock market using weekly return data from 2000 to 2010. We document the presence of strong intra-sector return reversals in the short-term. The return reversals are not confined to any particular sector; returns to the contrarian strategy are significant for all sectors for holding periods of 1 to 4 weeks. Furthermore, the intra-sector contrarian strategy generally outperforms a market wide strategy. In addition, the returns to the contrarian strategy are robust to changes in the criteria for winner and loser stock selection. However, the findings reveal that reversals are not as prominent in the intermediate term. We find that the returns are no longer significant for five of the nine sectors for the holding period of 52 weeks. We conclude that short-term intra-sector return reversals are present in the Malaysian market and might be profitability exploited using a contrarian trading strategy.

Keywords: Return Reversal; Contrarian Strategy; Overreaction; Return Predictability; Malaysian Stock Market.

1. INTRODUCTION

Return predictability of stocks is a well-researched area of interest as academics are intrigued by the phenomenon due to the contradictions it presents to the efficient market hypothesis (EMH), which is one of the foremost pillars of finance. When dealing with the subject of predictable patterns of stock returns, the appeal for investors, institutional or individual, lies in the potential exploitation of predictable return patterns to earn a substantial profit. If the stock return movements can be consistently predicted then a trading strategy could be developed and implemented to take advantage of this.

♣ Corresponding Author: Ruhani Ali, Graduate School of Business, Universiti Sains Malaysia 11800 USM Pulau Pinang, Malaysia.
Tel: +604 6533954. Fax : +604 6532792. E-mail address: ruhani@usm.my

A particularly intriguing return predictability is that of reversals in stock returns. De Bondt and Thaler (1985) were the first to document long-term return reversals in the stock market. Stocks returns experienced reversals such that stocks performing well in the past (winners) perform poorly in the future and stocks with poor past performance (losers) tend to become winners. The authors attributed this phenomenon to the overreaction of investors towards unexpected news. In addition, Lehmann (1990) and Jegadeesh and Titman (1995) presented evidence that the reversals also do occur for the short-term for the US stock market. Investors could benefit by undertaking arbitrage positions that exploit these patterns in stock returns. This trading strategy of buying losers and selling winners is known as the contrarian strategy. Similar returns reversals have been found in international markets including Malaysia (Anusakumar et al., 2013; Hameed and Ting, 2000).

Several factors have been shown to influence the levels of reversals. Among these are trading volume, liquidity and firm size. While these factors have had some success, the source and cause of return reversals are still ambiguous. In this study, we examine the relationship between reversals and sectors. Specifically contrarian strategies are implemented after sorting the stocks by sector in order to test for the presence of intra-sector reversals. This study is partly motivated by Moskowitz and Grinblatt's (1999) paper on industry and momentum. Industry momentum was found to be more prominent than stock momentum. The authors attributed stock momentum profits to the industrial component in stock returns. Following a similar line of inquiry, we investigate whether sectors have a bearing on short-term reversals. Sorting stocks into sectors prior to implementing the contrarian strategy has additional benefits. The stocks from the same sector would be better matched in terms of the exposure to market and risk factors. Hence matching firms based on sector could enable a more effective implementation of contrarian strategy.

Past studies on the Malaysian stock market have focused primarily on the pre-crisis period. The results may not still be applicable particularly as Bursa Malaysia has gone through much change. The trading environment and sentiments may have been altered by the 1997 Asian financial crisis and the recent global crisis. Therefore, the extent to which investors overreact to news, assuming this is what drives the short-term contrarian returns, could be affected as well. As such, it is necessary to reexamine the contrarian strategy in the current stock market environment.

Whilst reversals dominate in the short-term, return continuation (momentum) can be observed over longer periods. This phenomenon, initially documented by Jegadeesh and Titman (1993), yields around 1% return per month for the intermediate period of 3 months to 1 year. Momentum has been extensively documented in the US. There is also international evidence that further affirms the profitability of the momentum effect (e.g. Brown et al., 2008; Griffin et al., 2003; Naranjo and Porter, 2007). Following this, we proceed to examine whether the return reversal found in the Malaysian stock market halts in the intermediate horizon and gives rise to momentum. To this end the winner, loser and contrarian portfolios are held for a longer period of 12 to 52 weeks.

This study covers an 11-year period from 2000 to 2010. The contrarian returns may or may not be consistently present throughout the years. To probe deeper into this, we split the sample

period into yearly sub periods (11 sub periods) and investigate the persistence of the reversals by examining profitability of the contrarian strategy in sub periods. In addition, we also explore whether a change in the composition of loser and winner portfolio affects contrarian returns. The stock selection criteria is changed to assess whether contrarian returns are affected. For this purpose, we use two alternative winner and loser stock selection criteria commonly employed in past studies.

The remainder of this paper is organized as follows. In Section 2, we briefly discuss previous studies on return reversals. The source of data and screening process is detailed in Section 3. In addition the methodology is also described in detail. We present and discuss the results of this study in Section 4. Lastly, Section 5 concludes the paper.

2. LITERATURE REVIEW

In their seminal work, De Bondt and Thaler (1985) documented evidence of a long-term return reversal and postulated the overreaction hypothesis an explanation for this phenomenon. Winner and loser portfolios formed based on stocks' past performance were found to experience return reversals in future months. Significant average cumulative abnormal returns (ACAR) were found for the arbitrage portfolio over the holding periods. The authors concluded that the stock market overreacts causing reversals in the long-term.

Apart from long-term reversals, studies have emerged providing evidence on profitability of short-term contrarian strategy utilizing weekly data. Using NYSE and ASE stocks, Lehmann (1990) showed that significant returns could be generated from buying losers and selling winners. The contrarian returns were positive and highly significant for all of the holding periods (1, 4, 13, 26, and 52 weeks). The author stated that the reversals provided strong evidence against the efficient market hypothesis (EMH). Similarly, Lo and MacKinlay (1990) provided support for the viability of short-term contrarian strategy. In spite of this, the authors argued against overreaction as the sole source of contrarian returns. Less than 50 percent of the returns were traced back to overreaction. Instead, the 'cross effects' between the stocks were proposed as the major driving factor of the short-term returns. Jegadeesh and Titman (1995) also found similar results using NYSE and ASE stocks for the period 1963 to 1990. The contrarian strategy produced an economically and statistically significant return of 1.37 percent per week. The authors found that the returns were in fact due to overreaction rather than the result of a lead lag effect that was proposed by Lo and MacKinlay (1990). In a recent study, de Groot et al. (2012) showed that trading costs diminish contrarian strategy returns due to excessive trading in small stocks. Nevertheless, the authors demonstrated that investors could earn substantial returns using a more sophisticated trading strategy.

The evidence on return reversals is not limited to the US stock market. Kang et al. (2002) reported significant short-term contrarian returns and momentum in the intermediate term over selected ranking and holding periods for the Chinese stock market. The sample was restricted to solely A shares, which are available to local investors. The study period was from January 1993 to January 2000. For the contrarian strategy with stock ranking based on previous 1 week returns, only the 1 week holding period was significant. The returns for holding periods of

2 to 26 weeks were positive (but insignificant) and conspicuously smaller. The authors noted the presence of return asymmetry with losers having greater returns than winners do. Examining a similar period from 1 August 1994 to 31 July 2000, Wang et al. (2004) found return reversals for the Chinese market but the reversals are transient. The portfolio earned a significant return of 1.07% for week 1 but the returns were insignificant and predominately negative for the remaining weeks indicating reversals had halted by end of week 1. The authors concluded that investor overreaction does occur in China. In a more recent study, Chen et al. (2012) reported significant contrarian returns in China for the sample period of 1995 to 2010. Similar to Kang et al. (2002), the sample consisted of only A shares listed in the Shanghai Stock Exchange and Shenzhen Stock Exchange. Significant returns to the contrarian portfolio could be observed for holding periods of up to 16 weeks. Moreover, market state seemed to play an important role in determining the profitability of the contrarian strategy. Contrarian strategies following 'down' market state outperformed the 'up' market state.

Lee et al. (2003) found short-term contrarian strategy to be profitable in Australia. Decomposition of the contrarian returns revealed that a majority of the returns were indeed contributed by overreaction. In contrast, lead lag effects reduced contrarian returns. On the other hand, Antoniou et al. (2005) looked at the Athens stock market for evidence of short-term reversals. The results indicated significant returns could be obtained from implementing a zero cost 'loser minus winner' portfolio (contrarian portfolio). Past one week's return was used to sort and classify winner and loser stocks and the portfolios were rebalanced weekly. The strategy remained profitable even after adjusting for risk and thin trading. For the Hong Kong market, Ramiah et al. (2011) documented significant returns to the contrarian strategy for the period of March 1992 to August 2006. The holding period of the contrarian portfolios ranged from 1 month to 12 months. The authors further noted that a contrarian strategy implemented on a sample of dually-traded companies yielded higher returns than companies listed solely on the Hong Kong Stock Exchange.

For the Malaysian market, Hameed and Ting (2000) provided evidence of a significant albeit short-lived contrarian return. The formation period was fixed at 1 week whereas the holding period was from 1 to 4 weeks. The strategy of buying losers and selling winners proved to be significantly positive for the first week with return of 0.41% per week. The returns were insignificant for 2 weeks and surprisingly negative for the 3 and 4 weeks holding period indicating that the reversals are restricted to the week immediately following the formation period. The study primarily focused on examining the relationship between trading volume and reversals for the Malaysian stock market. The contrarian strategy was found to be profitable only for high volume stocks.

Ahmad and Tjan (2004) examined return reversals in Malaysia and in particular the overreaction hypothesis for the year 1997. Ten stocks with the highest gain (loss) as reported in the local newspaper were sorted into the winner (loser) portfolio. The authors found no significant returns to the contrarian portfolio for 1, 2 and 3 weeks after portfolio formation. A sub sample analysis revealed that negative returns were predominantly present in the pre crisis period from January to June 1997. In contrast, returns were all positive but insignificant in post crisis period. The authors concluded that return reversals are evident in winner and loser portfolio but these reversals could not provide significant contrarian returns.

In a recent study, Ali et al. (2011) found return reversals in the Malaysian stock market for the sample period of 2000 to 2010. While both winner and loser portfolios were found to exhibit return reversals, the loser portfolio experienced stronger reversals. Moreover, the evidence suggested that a contrarian strategy might be successful, particularly for holding periods of 1 to 12 weeks. Analysis of trading volume and reversals revealed that low volume stocks experienced greater reversals than high- and medium-volume stocks. Low volume stocks also had reversals that are more persistent; thus, contrarian strategies may be profitable for holding periods of up to 52 weeks.

3. DATA SOURCE AND METHODOLOGY

We use weekly price data for stocks listed on the Bursa Malaysia. The study period extends from January 2000 to October 2010, comprising of 562 weeks. Stocks with incomplete data are excluded from the sample. We obtain the data pertaining to stocks from Thomson Financial Datastream. Additional screening is required to avoid data errors arising from the use of Datastream. As such, stocks with returns above 300% are coded as missing (Ince and Porter, 2006). The screening process results in a final sample of 510 stocks. Kuala Lumpur Composite Index (KLCI) is used as the market return proxy. KLCI is the standard benchmark and is routinely used in studies pertaining to the Malaysian stock market.

For the purpose of segregating stocks into sectors, the Bursa Malaysia classification is utilized. The local classification is favoured over the global industrial classification standard (GICS). This is because investors would be more likely to attribute stocks to the respective sector based on the official listing in the home market. Response to sector related news will corresponding be made on that presupposition. Thus, we segregate stocks based on the official sector listing on the main board of Bursa Malaysia. As per Bursa Malaysia classification, there are 13 sectors. However, we combined 4 sectors (REITS, IPC, Mining and Hotels) into a single sector labeled 'others' as there were an insufficient number of stocks in the sectors. Closed end fund sector, which consists of a single company, was not included in the sample due to incompleteness of data. The sorting yields a total of nine sectors: Construction, Consumer Products, Finance, Industrial Products, Others, Plantation, Properties, Technology and Trade & Services. Sector related information is obtained from Bursa Malaysia website.

The construct of the contrarian strategy is similar to that of De Bondt and Thaler (1985). In order to obtain abnormal returns, market adjusted returns are used with KLCI as proxy for market return. The winner and loser portfolio construction entails ranking stocks based on the past performance. For each week, we rank the stocks in a descending order according to the past week's returns. The top one third of the stocks is classified as the winners whereas the bottom one third is the losers. It should be noted that top and bottom one third is used rather than quintiles or deciles due to the small sample size in each sector. We then form two equally weighted portfolios using the selected winner and loser stocks. The portfolios are held for the next K week (wherein $K=1, 2, 3, 4$ weeks). The average cumulative abnormal returns (ACAR) for the winner and loser portfolios (loser-winner portfolio) are calculated for K holding periods. In essence, winner stocks are sold and loser stocks are bought for the contrarian strategy creating a zero cost arbitrage portfolio. Thus, returns to the contrarian portfolio can be calculated as the difference in returns between the loser and winner portfolio.

4. RESULTS AND DISCUSSION

The descriptive statistics are provided in Table 1. The sample of 510 stocks is sorted into sectors based on the Bursa Malaysia classification resulting in a total of nine sectors. Industrial products sector has the highest concentration of stocks with 146 stocks. The least number of stocks are in the 'others' sectors which is composite of four sectors (REITS, IPC, Mining and Hotels). Average weekly returns are positive for all sectors with the exception of technology sector. Returns for technology sector are the most volatile with the highest standard deviation among the sectors.

Table 1: Descriptive Statistics

Sector	No. of Stocks	Mean	Skewness	Kurtosis	Std.
Construction	39	0.05	0.40	2.78	2.39
Consumer Products	67	0.05	0.37	3.36	1.91
Finance	32	0.01	0.79	2.81	1.74
Industrial Products	146	0.07	0.54	4.76	2.24
Others	11	0.06	2.05	13.21	2.45
Plantation	32	0.15	0.81	4.32	2.11
Properties	69	0.03	0.68	2.03	2.70
Technology	14	-0.11	1.76	10.25	3.46
Trade & Services	100	0.03	0.51	2.40	2.05

Notes: The total sample consists of 510 stocks, which are segregated into 9 sectors as listed in the first column. The second column shows the number of stocks in each sector. The remaining columns provide the average market adjusted weekly return ('mean'), skewness, kurtosis and standard deviation ('std.') of returns for the respective sectors.

4.1. Short-term reversals

Though the main objective of this study is to examine intra-sector reversals, we start off by computing a market wide strategy otherwise known as an unrestricted strategy for comparative purposes. This involves implementing a contrarian strategy on the total sample of stocks, as performed in prior studies (e.g. Jegadeesh and Titman, 1995; Lehmann, 1990), without any segregation into sectors. Table 2 presents the average cumulative abnormal returns (ACAR) for the contrarian strategy implemented at the stocks level using the total sample of 510 stocks. The ACAR for the winner, loser and loser-winner portfolio are provided for 1 to 4 weeks holding periods. As can be observed, the winner portfolio experiences significant reversals as the post-formation portfolio returns are significantly negative for all holding periods. Likewise, reversals are also evident for the loser portfolio with significant positive returns for 1 to 4 weeks. In short, winner stocks have now transformed into losers whereas losers have become winners.

Creating a strategy to exploit this reversal by buying past losers and selling past winners generates statistically significant returns at the 1 percent level. Not only are the returns

significant from a statistical standpoint, the returns are also economically significant. For example, holding the portfolio of loser-winner stocks for three weeks generates ACAR as high as 1.72%. Moreover, the returns to the contrarian strategy are consistent as all four holding period ACARs are highly significant at 1 percent level and well above 1%.

Table 2: Short-term Contrarian Returns

Portfolio	1 weeks	2 weeks	3 weeks	4 weeks
Winner	-0.61 (-5.90)***	-0.67 (-4.69)***	-0.75 (-4.66)***	-0.66 (-3.67)***
Loser	0.70 (7.54)***	0.84 (6.21)***	0.96 (5.50)***	1.00 (5.06)***
Loser-Winner	1.31 (15.39)***	1.51 (12.58)***	1.72 (12.93)***	1.66 (11.31)***

Notes: The average cumulative abnormal return for winners, losers and neutral portfolios are presented. The sample of 510 stocks is ranked based on the previous week's returns and sorted into three equally weighted portfolios. The best and worst performing stocks are classified as winners and losers respectively. Portfolio average cumulative abnormal returns (ACAR) are then computed for the following one, two, three and four weeks. *, **, *** denotes significance at 10%, 5% and 1% level respectively.

The results for winner portfolio echoes the findings of Ahmad and Tjan (2004) where reversals are eminent. Ahmad and Tjan (2004) reported negative returns for the loser portfolio although the magnitude was much smaller in the holding period than formation period seemingly indicating the presence of reversals. We find a much more apparent and stronger reversal for losers. The contrarian returns is another point of divergence. The authors could not find any significant returns but we find the contrarian strategy to be highly profitable and stable throughout 1 to 4 weeks of holding period. In contrast to our strong findings, Hameed and Ting (2000) also failed to find persistent contrarian returns reporting significant returns for only 1 week after portfolio formation and the fleeting returns were further compounded by the losses to the contrarian portfolio in week 3 and 4. Rather than the Malaysian studies, our findings are more in line with studies conducted in the US market. The magnitude and persistence of the returns match up with those reported by Jegadeesh and Titman (1993) and Lehmann (1990).

4.2. Intra-sector short-term reversals

Table 3 represents the returns for winner and loser portfolios for the holding period of 1 to 4 weeks. A negative return for winners and a positive return for losers would imply that a return reversal has occurred. For all of the holding periods, losers have positive returns whereas winners have negative returns (with the exception of 4 week holding period for the plantation sector). Moreover, the majority of the returns are statistically significant. Out of the 72 portfolios, only six of the returns are insignificant and two are marginally significant at the 10% level.

Table 3: Intra-sector Short-term Returns for Winner and Loser Portfolios

Sector	1 week		2 weeks		3 weeks		4 weeks	
	Winners	Losers	Winners	Losers	Winners	Losers	Winners	Losers
Construction	-0.65 (-4.75)***	0.71 (5.57)***	-0.67 (-3.70)***	0.87 (4.78)***	-0.66 (-3.13)***	1.06 (4.61)***	-0.59 (-2.53)**	1.14 (4.53)***
Consumer Products	-0.68 (-5.85)***	0.85 (8.35)***	-0.80 (-5.25)***	1.00 (7.08)***	-0.87 (-5.11)***	1.16 (6.57)***	-0.78 (-4.23)***	1.20 (5.95)***
Finance	-0.43 (-3.79)***	0.36 (3.92)***	-0.50 (-3.24)***	0.45 (3.31)***	-0.66 (-3.75)***	0.50 (3.01)***	-0.68 (-3.45)***	0.44 (2.34)**
Industrial Products	-0.74 (-6.15)***	0.84 (7.50)***	-0.78 (-4.66)***	1.00 (6.46)***	-0.87 (-4.56)***	1.17 (5.70)***	-0.72 (-3.25)***	1.19 (5.21)***
Others	-0.74 (-3.97)***	1.02 (4.41)***	-0.86 (-3.11)***	1.14 (4.40)***	-0.80 (-2.77)***	1.34 (4.71)***	-0.42 (-1.22)	1.12 (3.35)***
Plantation	-0.28 (-2.05)***	0.52 (4.42)***	-0.11 (-0.63)	0.64 (3.86)***	-0.06 (-0.26)***	0.84 (4.04)***	0.14 (0.57)	1.14 (4.75)***
Properties	-0.82 (-5.58)***	0.85 (6.59)***	-0.89 (-4.44)***	0.96 (5.21)***	-1.03 (-4.51)***	1.10 (4.68)***	-0.98 (-3.93)***	1.14 (4.17)***
Technology	-0.62 (-2.95)***	0.37 (1.89)***	-0.91 (-2.97)***	0.59 (2.12)***	-1.17 (-3.35)***	0.63 (1.81)***	-1.23 (-3.26)***	0.53 (1.32)***
Trade & Services	-0.56 (-4.96)***	0.62 (5.68)***	-0.61 (-3.94)***	0.77 (4.92)***	-0.73 (-4.12)***	0.87 (4.54)***	-0.66 (-3.29)***	0.94 (4.30)***

Notes: The average cumulative average abnormal returns (ACAR) for winner and loser portfolios are presented. Stocks are segregated into 9 sectors and portfolios are formed within each sector. Stocks are ranked based on the previous week's returns and the best and worst one third performing stocks are classified as winners and losers respectively. The selected stocks are sorted into equally weighted winner and loser portfolios. Portfolio returns are then computed for the following one, two, three and four weeks. *, **, *** denotes significance at 10%, 5% and 1% level respectively.

Overall reversals do not seem to be propelled by any specific portfolio, winner or loser. The asymmetric returns reported in previous studies are not apparent in the first week. However, by 4 weeks, the returns for losers tend to be larger than that of winners. This could be due to the propensity for investors to place more weight on to bad news than to good news causing more a severe reaction for negative news (Kahneman and Tversky, 1979). However, it is important to note that the unequal returns of winners and losers do not necessarily mean that the reversals are asymmetric. The initial return mispricing has to be taken into consideration. For example a return of -1.3% for winners and 1.3% for losers does not necessarily imply a symmetric reversal even though we may intuitively be more likely to believe that the reversals are equal. The degree of initial overreaction for the winners and losers may be different; hence the subsequent returns to correct the mispricing would also be unequal. This gives rise to an impression of asymmetric reversals. In any case, the seemingly asymmetric reversals are consistent with past studies (e.g. De Bondt and Thaler, 1985).

The returns of the intra-sector contrarian strategy are listed in Table 4. The loser-winner portfolio which is formed based on shorting winners and longing losers garnered positive

Table 4: Intra-sector Returns for Short-term Contrarian Strategy

Sector	1 week	2 weeks	3 weeks	4 weeks
Construction	1.35 (9.74)***	1.53 (8.01)***	1.73 (7.39)***	1.73 (7.02)***
Consumer Products	1.53 (13.12)***	1.80 (12.39)***	2.03 (12.12)***	1.98 (10.55)***
Finance	0.79 (6.59)***	0.95 (5.78)***	1.16 (6.32)***	1.13 (5.45)***
Industrial Products	1.58 (14.44)***	1.77 (12.07)***	2.05 (12.16)***	1.90 (10.16)***
Others	1.76 (6.18)***	1.99 (5.36)***	2.14 (5.64)***	1.54 (3.34)***
Plantation	0.80 (5.61)***	0.75 (3.83)***	0.90 (4.05)***	1.00 (4.15)***
Properties	1.67 (13.77)***	1.84 (11.13)***	2.14 (11.45)***	2.12 (10.08)***
Technology	0.98 (4.42)***	1.50 (4.84)***	1.80 (4.99)***	1.76 (4.29)***
Trade & Services	1.18 (10.89)***	1.38 (9.29)***	1.61 (9.13)***	1.60 (8.02)***

Notes: The average cumulative average abnormal returns (%) for loser-winner portfolios are presented. Winner and loser portfolios are formed within each sector. Zero cost portfolio is formed by taking a short position in winners and long position in losers. Portfolio returns are calculated for holding periods of one, two, three and four weeks. *, **, *** denotes significance at 10%, 5% and 1% level respectively.

returns for all sectors throughout the holding periods. Astonishingly the returns are economically and statistically significant for all test periods and sectors. The returns range from 2.14% (properties and others at 3 week holding period) to 0.75% (plantations sector at 2 weeks). Given the strength and persistence of the returns, the evidence supports the existence of intra-sector reversals and profitable exploitation of those reversals by adopting a zero cost contrarian strategy.

Though differences in methodology make direct comparisons difficult, the level of returns is drastically higher than that previously documented by Hameed and Ting (2000) for stock reversals in the Malaysian market. The intra-sector contrarian strategy seems to produce higher returns compared to market wide contrarian strategy. Next, we compare the profitability of market wide (as presented in Table 2) and intra-sector contrarian strategies to confirm whether intra-sector returns are indeed higher. In comparison with loser-winner portfolio in Table 2, higher levels of returns can be observed for 1 week, 2 weeks, 3 weeks, and 4 weeks for selected sectors. Looking at returns one week after formation, construction, consumer products, industrial products, others and properties earn higher returns than market wide strategy. The out performance is also evident for the 2 weeks holding periods for the same sectors. On the other hand, six sectors have superior performance for 3 weeks. The same holds true for 4 weeks holding period with five sectors. For example, the contrarian strategy implemented in the properties sector and on a market wide basis yields 2.12% and 1.66% respectively. Thus, the contrarian portfolio for the properties sector generates 1.28 times the return of the market wide strategy. Overall, contrarian returns for the properties sector clearly outperforms the returns of the market wide strategy. Consumer products and industrial products also have greater returns than market wide strategy for all of the holding periods. This gives credence to the proposition that reversals are due to overreaction to firm specific information (Lehmann, 1990).

In a previous study by Hameed and Ting (2000), the relationship between trading volume and contrarian strategy was sporadic with no notable returns beyond the first week. In comparison, we find that sorting by sector produces higher returns that are significant even at the 1 percent level. The evidence seems to indicate that sector has a larger bearing on contrarian returns than trading volume. Nevertheless further studies are needed for a direct comparison to confirm this possibility.

4.3. *Yearly contrarian returns*

Though compelling evidence of return reversal was found in the short-term, the persistence of this effect throughout the years is uncertain. The magnitude and significance of the reversals may be affected by a multitude of factors including investor sentiments and market conditions. The profitability of the contrarian strategy may not hold for sub periods. To analyze and discern the overall trend of the reversals we split the sample period and examine reversals for 11 yearly sub periods.

Table 5 details the yearly breakdown of intra-sector contrarian returns. The returns are predominantly positive with only 13 of the cases being negative. Even then, the negative returns are not significant at the 5% level. In addition, the positive returns appear to be

substantially large and statistically significant. For example, industrial products experience a return of 3.33% for 2009, which is significant at the 1% level. This demonstrates the strength and consistency of the reversals. This indicates that the contrarian strategy is highly profitable in sub periods.

Table 5: Intra-sector Short-term Contrarian Returns by Year

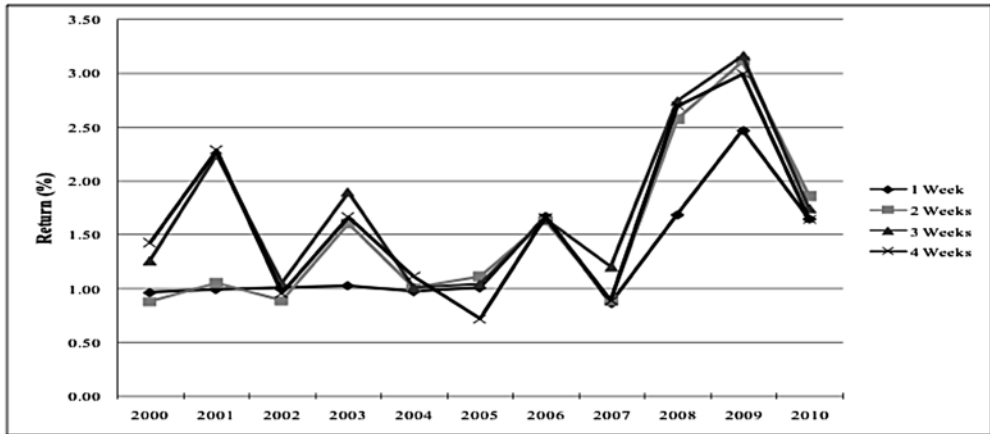
Sector	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<i>K = 1 week</i>											
Construction	1.50	1.60	1.53	0.76	0.73	0.94	2.34	0.36	2.05	1.89	1.09
Consumer Products	(3.46)	(3.63)	(3.60)	(1.94)	(2.37)	(2.62)	(5.08)	(0.76)	(3.74)	(3.44)	(1.83)
	0.99	1.11	0.83	1.58	1.07	1.13	1.63	1.64	2.41	2.68	1.82
Finance	(2.66)	(2.24)	(2.94)	(4.26)	(3.64)	(4.46)	(4.88)	(5.06)	(5.74)	(4.85)	(4.90)
	0.23	0.81	0.47	0.40	1.07	1.17	0.89	0.52	0.71	1.62	0.76
Industrial Products	(0.53)	(2.06)	(1.49)	(0.92)	(3.56)	(5.07)	(2.38)	(0.98)	(1.63)	(4.01)	(2.05)
	0.84	1.26	0.73	1.35	0.84	1.32	1.33	1.90	2.69	3.33	1.77
Others	(2.19)	(3.29)	(3.16)	(3.57)	(4.58)	(5.95)	(4.93)	(7.25)	(5.16)	(7.06)	(5.64)
	1.95	1.15	1.60	1.47	2.36	0.90	2.83	0.50	0.32	3.42	3.25
Plantation	(3.08)	(2.12)	(2.12)	(1.61)	(3.58)	(1.09)	(1.46)	(0.68)	(0.34)	(4.58)	(3.85)
	-0.31	0.89	0.74	0.33	0.78	0.87	1.86	0.77	1.01	1.16	0.66
Properties	(-0.54)	(1.21)	(2.22)	(0.72)	(1.56)	(1.63)	(5.32)	(2.16)	(1.94)	(4.36)	(2.86)
	1.49	1.03	1.03	1.09	0.95	1.32	2.04	0.84	2.87	3.73	2.04
Technology	(4.11)	(2.49)	(3.65)	(2.44)	(3.20)	(4.04)	(5.44)	(1.80)	(5.87)	(9.84)	(7.75)
	0.47	0.24	0.94	0.90	0.53	0.55	0.66	1.01	1.72	2.20	1.75
Trade & Services	(0.73)	(0.22)	(1.17)	(1.89)	(1.35)	(1.25)	(0.75)	(1.42)	(2.29)	(2.93)	(1.91)
	1.49	0.85	1.18	1.35	0.43	0.87	1.45	0.21	1.39	2.18	1.69
	(4.84)	(1.89)	(4.86)	(3.00)	(2.00)	(3.50)	(3.75)	(0.58)	(3.22)	(5.75)	(6.74)
<i>K = 2 weeks</i>											
Construction	1.25	1.02	1.53	0.85	1.04	0.32	2.85	1.11	3.47	1.83	1.56
	(2.00)	(1.53)	(3.34)	(1.38)	(2.73)	(0.65)	(4.64)	(1.79)	(3.71)	(2.66)	(2.55)
Consumer Products	0.77	1.47	0.64	2.03	1.51	1.85	1.49	1.66	2.76	3.58	2.12
	(1.40)	(2.31)	(1.67)	(4.72)	(4.41)	(5.57)	(3.68)	(3.71)	(5.66)	(6.05)	(4.42)
Finance	0.44	1.02	0.46	1.32	1.16	1.09	0.50	0.04	1.13	2.01	1.33
	(0.67)	(1.95)	(1.00)	(2.40)	(2.76)	(3.40)	(0.86)	(0.06)	(2.11)	(4.01)	(2.35)
Industrial Products	0.62	1.35	0.98	1.87	0.87	1.37	1.64	1.66	3.29	4.17	1.60
	(1.05)	(2.31)	(3.46)	(3.65)	(3.31)	(3.95)	(4.15)	(4.43)	(5.65)	(7.11)	(3.73)
Others	2.55	1.02	0.40	2.30	1.73	2.59	1.66	-0.25	3.57	3.45	3.18
	(2.79)	(1.20)	(0.33)	(2.07)	(2.05)	(2.50)	(0.66)	(-0.28)	(3.29)	(3.52)	(2.90)
Plantation	-0.73	0.46	0.86	0.96	0.39	0.99	1.62	0.23	1.23	1.40	0.79
	(-0.86)	(0.45)	(1.59)	(1.41)	(0.61)	(1.56)	(3.53)	(0.38)	(2.09)	(4.28)	(2.62)
Properties	1.00	0.97	1.44	1.41	0.98	1.30	2.07	0.73	3.58	4.54	2.36
	(1.53)	(1.67)	(3.36)	(2.67)	(3.06)	(2.98)	(3.96)	(1.09)	(5.66)	(10.34)	(5.76)
Technology	0.54	0.94	0.38	1.30	0.94	-0.20	1.04	2.68	2.43	4.34	2.30
	(0.62)	(0.62)	(0.31)	(2.10)	(1.69)	(-0.35)	(0.83)	(2.51)	(2.46)	(4.23)	(2.27)
Trade & Services	1.45	1.21	1.29	2.39	0.41	0.67	1.77	0.13	1.69	2.68	1.48
	(2.68)	(2.35)	(3.34)	(4.34)	(1.25)	(1.58)	(3.49)	(0.26)	(3.21)	(5.27)	(3.29)

Table 5: Intra-sector Short-term Contrarian Returns by Year

Sector	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
K = 3 weeks											
Construction	1.17 (1.73)	2.79 (2.91)	1.97 (3.69)	1.07 (1.32)	0.64 (1.26)	0.22 (0.33)	2.78 (4.01)	1.73 (2.35)	3.14 (2.96)	2.08 (2.32)	1.24 (1.74)
Consumer Products	1.48 (2.52)	2.38 (3.77)	0.49 (1.27)	2.29 (4.39)	1.29 (3.48)	1.70 (4.54)	1.37 (2.80)	1.88 (3.62)	3.08 (4.82)	4.31 (5.60)	2.12 (4.10)
Finance	0.86 (1.15)	1.59 (2.53)	0.46 (0.91)	1.50 (2.53)	1.31 (2.85)	1.02 (2.71)	1.55 (2.40)	0.32 (0.41)	1.38 (2.15)	1.75 (3.21)	0.95 (1.42)
Industrial Products	1.08 (1.59)	2.44 (4.16)	0.94 (2.68)	2.25 (3.46)	0.75 (2.18)	1.53 (4.06)	1.80 (4.17)	1.84 (4.10)	3.71 (6.24)	4.23 (5.54)	1.86 (3.60)
Others	2.43 (2.48)	2.18 (2.09)	0.61 (0.46)	3.12 (2.94)	1.92 (1.88)	2.51 (2.17)	2.65 (1.19)	-0.76 (-0.77)	2.52 (2.26)	3.60 (3.23)	2.98 (2.45)
Plantation	-0.60 (-0.59)	1.76 (1.49)	0.86 (1.26)	0.92 (1.28)	0.96 (1.43)	0.71 (1.01)	1.20 (2.76)	0.29 (0.45)	1.38 (2.12)	1.68 (3.58)	0.67 (1.91)
Properties	1.54 (2.23)	2.05 (2.81)	1.21 (2.56)	2.26 (3.53)	0.76 (1.88)	1.35 (2.55)	1.58 (2.62)	1.64 (2.07)	4.20 (6.67)	4.26 (8.21)	2.83 (7.33)
Technology	1.80 (1.64)	3.08 (1.78)	1.00 (0.81)	0.79 (1.02)	1.41 (2.02)	-0.36 (-0.58)	-0.14 (-0.10)	3.24 (2.55)	3.30 (3.06)	4.05 (3.04)	1.55 (1.06)
Trade & Services	1.57 (2.32)	1.92 (2.69)	1.93 (4.20)	2.88 (4.80)	0.04 (0.11)	0.70 (1.47)	2.01 (3.41)	0.63 (1.03)	1.95 (3.21)	2.51 (4.09)	1.49 (2.90)
K = 4 weeks											
Construction	1.14 (1.53)	2.30 (2.17)	2.11 (3.29)	1.28 (1.59)	0.88 (1.45)	0.18 (0.28)	2.78 (3.58)	1.26 (1.63)	3.47 (3.58)	2.26 (2.31)	1.19 (1.54)
Consumer Products	1.71 (2.74)	2.39 (3.09)	1.01 (2.08)	2.18 (3.35)	1.76 (4.16)	1.12 (2.84)	1.48 (2.49)	1.18 (2.22)	2.68 (3.85)	4.47 (5.48)	1.77 (3.01)
Finance	0.77 (0.86)	1.65 (2.15)	0.68 (1.07)	1.18 (1.74)	1.38 (2.54)	1.11 (2.76)	1.39 (1.83)	0.10 (0.13)	1.72 (2.57)	1.10 (1.63)	1.38 (2.05)
Industrial Products	1.01 (1.34)	2.46 (3.84)	0.92 (2.16)	2.05 (3.05)	0.99 (2.14)	1.37 (3.00)	1.46 (3.11)	1.65 (3.27)	3.24 (4.57)	3.79 (4.47)	2.02 (3.30)
Others	2.71 (2.23)	2.46 (2.11)	-0.86 (-0.61)	2.27 (1.72)	0.82 (0.70)	1.04 (0.95)	2.81 (0.94)	-1.27 (-0.93)	2.03 (1.61)	3.36 (2.43)	1.59 (1.24)
Plantation	-1.02 (-0.97)	2.05 (1.61)	1.16 (1.47)	0.94 (1.22)	1.65 (2.18)	0.39 (0.65)	1.33 (2.18)	0.77 (1.01)	1.49 (2.14)	1.52 (3.26)	0.57 (1.32)
Properties	1.88 (2.28)	2.33 (2.92)	1.18 (1.99)	2.01 (3.01)	1.16 (2.43)	1.44 (2.68)	1.72 (2.10)	1.37 (1.69)	4.31 (6.63)	3.61 (5.18)	2.33 (5.16)
Technology	2.96 (2.44)	2.91 (1.55)	0.81 (0.49)	0.63 (0.71)	1.16 (1.54)	-0.97 (-1.45)	-0.12 (-0.07)	2.21 (1.70)	3.11 (2.94)	4.39 (2.79)	2.47 (1.42)
Trade & Services	1.65 (2.31)	2.04 (2.41)	1.57 (3.04)	2.42 (4.32)	0.21 (0.59)	0.75 (1.20)	2.10 (3.43)	0.70 (0.97)	2.19 (3.59)	2.44 (2.73)	1.47 (2.66)

Notes: The contrarian strategy is implemented for yearly sub periods to evaluate the consistency of the returns reversals. The loser-winner portfolio is constructed for each sector and held for K weeks (K=1, 2, 3, 4). The ACAR (%) presented for each of the 11 sub periods.

The average returns to the intra-sector contrarian strategy are presented in Figure I Overall the reversals do not appear to be time period sensitive. The returns are positive for all sub periods. Interestingly, the returns increased at the latter part of the sample period. The transition from 2007 to 2008 is marked with a drastic increase in returns. The returns peaked in 2009 before entering into a downward trend in 2010. One possibility is that the 2007 global financial crisis exaggerated the level of overreaction. In a tumultuous and unstable environment, there is a tendency to panic. Any news that comes in, good or bad is misperceived. This coupled

Figure 1: Portfolio Returns for Intra-sector Contrarian Strategy

Notes: This figure illustrates portfolio returns (%) to the short-term intra-sector contrarian strategy with holding period from 1 week to 4 weeks for 11 yearly sub periods.

together with the higher propensity to herd leads to an increase in the level of overreaction. Hence, the pattern observed towards the end of the sample period could be explained by the recent global financial crisis.

4.4. *Alternative winner/loser classification*

Thus far, we have employed loser and winner selection of top and bottom on third of the sample respectively. In this section, we consider a change in the composition of the loser and winner portfolio by focusing on more extreme portfolios. For this purpose, two alternative criteria for the selection of winner and loser stocks are used. As in Jegadeesh (1990), the top and bottom 10% of the stocks are used for portfolio formation. In addition, we also employ a 20% classification for the winner and loser stocks (Zarowin, 1990).

Table 6 presents the returns to the contrarian strategy constructed using two different selection criteria: 10% and 20%. As more extreme stocks are used, the returns to the contrarian portfolio are generally higher. The 10% classification produces visibly higher contrarian returns than 20% classification. With reference to Table 4, selecting one third of the stocks produces lower returns than 10% and 20% selection. There is a steep increase in returns when a more restricted criteria is applied. For example, contrarian strategy implemented in the industrial products sector produces 1.90%, 3.05% and 4.88% for one third, 20% and 10% classification respectively in the first four weeks. This could help explain the variations in returns reported by studies examining the same stock market but using different selection criteria. Thus, differences in contrarian returns caused by the portfolio formation methodology, particularly the composition of winner and loser portfolio, should be kept in mind when evaluating and comparing studies. The magnitude of the contrarian returns varies with the change in classification of winner/loser stocks, nevertheless the overall conclusions derived from the

results are unaffected by the choice of winner/loser stocks. The contrarian returns persist following a change in the criteria for selecting the winner and loser stocks and are in fact stronger.

Table 6: Alternative Winners and Losers Classification

Sector	10%				20%			
	1 week	2 weeks	3 weeks	4 weeks	1 week	2 weeks	3 weeks	4 weeks
Construction	3.27 (10.95)***	3.82 (9.68)***	4.15 (9.47)***	4.09 (8.61)***	2.02 (10.66)***	2.47 (9.54)***	2.72 (9.35)***	2.68 (8.63)***
Consumer Products	3.70 (15.22)***	4.27 (13.80)***	4.83 (13.46)***	4.85 (12.28)***	2.38 (14.28)***	2.72 (13.24)***	3.07 (12.78)***	3.05 (11.35)***
Finance	1.87 (9.06)***	2.37 (8.26)***	2.68 (8.26)***	2.68 (7.11)***	1.11 (7.61)***	1.34 (6.48)***	1.56 (6.79)***	1.57 (6.08)***
Industrial Products	3.54 (16.30)***	4.27 (15.15)***	4.87 (15.92)***	4.88 (14.14)***	2.36 (16.70)***	2.70 (14.24)***	3.12 (14.86)***	3.05 (12.85)***
Others	2.67 (5.11)***	2.68 (3.41)***	3.60 (4.26)***	2.66 (2.90)***	2.26 (5.81)***	2.53 (5.09)***	2.91 (5.66)***	2.23 (3.91)***
Plantation	1.58 (5.23)***	1.87 (4.66)***	2.25 (4.57)***	2.98 (5.75)***	1.16 (5.99)***	1.32 (5.12)***	1.49 (4.91)***	1.78 (5.45)***
Properties	3.11 (13.20)***	3.61 (11.88)***	4.22 (11.86)***	4.30 (10.91)***	2.25 (13.62)***	2.50 (11.49)***	2.96 (11.90)***	3.06 (11.23)***
Technology	1.44 (2.83)***	2.29 (3.12)***	2.96 (3.65)***	3.42 (3.55)***	1.05 (4.00)***	1.78 (4.86)***	1.95 (4.57)***	1.94 (4.07)***
Trade & Services	2.77 (14.09)***	3.15 (11.74)***	3.47 (10.95)***	3.59 (10.42)***	1.85 (13.34)***	2.12 (11.50)***	2.34 (10.58)***	2.43 (9.90)***

Notes: This table provides the average cumulative abnormal returns (%) for the contrarian portfolio constructed using alternative definitions of winners and losers; 10% and 20% classification. For the 10% (20%) classification, winner and loser stocks are the top and bottom 10% (20%) of the stocks respectively based on the stock's previous week return. *, **, *** denotes significance at 10%, 5% and 1% level respectively.

4.5. Intermediate reversals

To study the behaviour of these reversals over longer periods of time, we extend the holding period from 12 weeks up to 1 year. Table 7 represents the returns of winner and loser portfolios with holding period of 12, 24, 36 and 52 weeks. Over this intermediate horizon, the existence of reversals is ambiguous as there is no definitive return pattern for the winner and loser portfolio. For the industrial product sector at 36 weeks, reversals do occur for the loser portfolio as evidenced by the positive returns but winner portfolio has significant positive return indication the presence of momentum (price continuation). On the other hand, the loser portfolio for the trade and services sector has positive but insignificant returns at 52 weeks and the return of winner portfolio follows suit.

The contrarian strategy (loser minus winner portfolio) is implemented in the intermediate period of 12 weeks to 1 year. The results are displayed in Table 8. For the 12 weeks holding period, the strategy is still profitable for all sectors with returns ranging from 1% to 3%. With increase in time, the level of returns seems to decrease. The notable exception to this is the

Table 7: Intra-sector Intermediate Returns for Winner and Loser Portfolios

Sector	12 weeks		24 weeks		36 weeks		52 weeks	
	Winners	Losers	Winners	Losers	Winners	Losers	Winners	Losers
Construction	0.29 (0.69)	1.33 (3.07)***	0.86 (1.34)	1.59 (2.33)**	1.35 (1.67)	2.64 (2.93)***	2.27 (2.31)**	4.48 (4.11)***
Consumer Products	-0.36 (-1.18)	1.41 (4.19)***	0.18 (0.42)	1.44 (2.98)***	0.56 (1.01)	1.75 (2.78)***	0.69 (1.01)	2.24 (2.97)***
Finance	-0.74 (-2.36)**	0.42 (1.27)	-0.72 (-1.63)	0.14 (0.28)	-0.42 (-0.76)	0.24 (0.39)	-0.16 (-0.24)	1.00 (1.29)
Industrial Products	-0.14 (-0.39)	1.35 (3.36)***	0.55 (1.04)	1.35 (2.23)**	1.50 (2.25)**	1.93 (2.53)**	2.42 (2.95)***	2.77 (3.12)***
Others	-0.48 (-0.98)	1.71 (3.30)***	1.17 (1.64)	2.23 (3.23)***	1.72 (2.07)**	3.69 (4.27)***	3.73 (3.74)***	6.03 (5.48)***
Plantation	1.49 (3.97)***	2.24 (5.50)***	2.96 (5.43)***	3.71 (5.97)***	4.32 (6.74)***	5.36 (7.04)***	7.17 (9.64)***	8.36 (10.20)***
Properties	-1.10 (-2.45)**	1.19 (2.57)**	-1.40 (-2.12)**	1.10 (1.55)	-1.29 (-1.57)	1.44 (1.58)	-0.80 (-0.81)	2.32 (2.23)**
Technology	-2.44 (-3.95)***	-0.74 (-1.16)	-3.87 (-4.42)***	-2.78 (-3.08)***	-5.39 (-5.04)**	-4.48 (-3.97)***	-7.57 (-6.05)***	-6.79 (-5.35)***
Trade & Services	-0.21 (-0.60)	0.60 (1.66)*	-0.15 (-0.33)	0.19 (0.36)	-0.17 (-0.29)	0.33 (0.51)	0.30 (0.47)	0.52 (0.71)

Notes: The average cumulative average abnormal returns (ACAR) for winner and loser portfolios are presented. Stocks are segregated into 9 sectors and portfolios are formed within each sector. Stocks are ranked based on the previous week's returns and the best and worst one third performing stocks are classified as winners and losers respectively. The selected stocks are sorted into equally weighted winner and loser portfolios. Portfolio returns are then computed for the following twelve, twenty four, thirty six and fifty two weeks. *, **, *** denotes significance at 10%, 5% and 1% level respectively.

Table 8: Intra-sector Returns for Intermediate Contrarian Strategy

Sector	12 weeks	24 weeks	36 week	52 weeks
Construction	1.05 (2.67)***	0.73 (1.34)	1.29 (1.82)*	2.21 (2.72)***
Consumer Products	1.77 (6.20)***	1.26 (3.35)***	1.19 (2.44)**	1.55 (2.73)***
Finance	1.15 (3.49)***	0.86 (1.83)*	0.66 (1.11)	1.17 (1.49)
Industrial Products	1.50 (5.54)***	0.80 (2.11)**	0.43 (0.93)	0.35 (0.65)
Others	2.19 (3.34)***	1.06 (1.14)	1.97 (1.72)*	2.30 (1.67)*
Plantation	0.76 (1.91)*	0.74 (1.27)	1.04 (1.52)	1.19 (1.58)
Properties	2.28 (7.15)***	2.50 (5.68)***	2.73 (5.16)***	3.13 (4.90)***
Technology	1.70 (2.62)***	1.10 (1.28)	0.92 (0.88)	0.78 (0.67)
Trade & Services	0.81 (2.50)**	0.34 (0.74)	0.50 (0.87)	0.22 (0.32)

Notes: The average cumulative average abnormal returns (ACAR) for loser-winner portfolios are presented. Winner and loser portfolios are formed within each sector. Zero cost portfolio is formed by taking a short position in winners and long position in losers. Portfolio returns are calculated for holding periods of twelve, twenty four, thirty six and fifty two weeks. *, **, *** denotes significance at 10%, 5% and 1% level respectively.

properties and consumer products sectors, which remain significant throughout the holding periods. Moreover, the returns are economically significant with 3.13% and 1.55% for properties and consumer products sectors respectively at 52 weeks. Interestingly consumer products and properties sectors experience positive and significant returns in the short as well as intermediate periods. In contrast to the evidence from US (e.g. Jegadeesh and Titman, 1995), there is no evidence of a profitable momentum strategy for the intermediate period. Looking at the winner and loser portfolios (table 7) the winner portfolio does experience return continuation but it is subsumed by the larger reversals on the part of the loser stocks. For example, there is return continuation of 2.42% for winners in the industrial product sector. However, this is cancelled out by the ongoing reversals of 2.77% for the losers. This results in an insignificant contrarian return of 0.35%.

5. CONCLUSION

We undertake an investigation into whether intra-sector return reversals are present in the Malaysian market. Implementing contrarian strategy based on short-term past returns yields highly profitable returns. The results of this study provide insight into the possibility of exploiting the return reversals within sector by implementing short-term contrarian investment strategies. Investors capitalizing on short-term intra-sector reversals could generate as much

as 2.14 percent for a 3-week holding period. Significant returns are present for all sectors throughout the 1 to 4 weeks holding period. Given the magnitude and significance of the returns, evidence for short-term intra-sector reversals is undeniable.

The consistency of the portfolio returns makes short-term contrarian strategy an appealing and profitable venture. More importantly, intra-sector contrarian strategy tends to outperform a market wide strategy (unrestricted strategy). When we extend the holding period further, the returns begin to diminish. Nevertheless, the returns remain positive for all holding periods. For the holding period of 1 year (i.e. 52 weeks), the portfolio returns are positive but insignificant for 5 out of 9 sectors.

Results thus far suggest that a contrarian strategy would be profitable. However, practical implementation of this strategy needs to take into account the transaction costs involved. In order to be truly profitable (in the practical sense), the contrarian returns must persist after accounting for transaction costs. Though de Groot et al. (2012) showed that substantial returns is garnered in spite of transaction costs by employing sophisticated trading strategies in US and Europe, the same may not hold true in Malaysia. Future studies could examine the post-transaction cost returns of contrarian strategy in the Malaysian market.

ACKNOWLEDGEMENTS

The authors gratefully acknowledge the support of Universiti Sains Malaysia Research University grant 1001/PPAMC/816104.

REFERENCES

- Ahmad, Z., & Tjan, S. (2004). Short-Run Overreaction, Stock Prices and Investors' Irrationality in the Kuala Lumpur Stock Exchange. *International Journal of Management Studies*, 11, 1-19.
- Ali, R., Ahmad, Z., & Anusakumar, S. V. (2011). Stock Market Overreaction and Trading Volume: Evidence from Malaysia. *Asian Academy of Management Journal of Accounting & Finance*, 7(2), 103-119.
- Antoniou, A., Galariotis, E. C., & Spyrou, S. I. (2005). Contrarian Profits and the Overreaction Hypothesis: the Case of the Athens Stock Exchange. *European Financial Management*, 11(1), 71-98.
- Anusakumar, S. V., Ali, R., & Hooy, C. W. (2013). Momentum and Contrarian Strategies on ASEAN Markets. In C. W. Hooy, R. Ali & S. G. Rhee (Eds.), *Emerging Markets and Financial Resilience: Decoupling Growth from Turbulence* (pp. 147-168). Basingstoke: Palgrave Macmillan.
- Brown, S., Yan Du, D., Rhee, S. G., & Zhang, L. (2008). The returns to value and momentum in Asian Markets. *Emerging Markets Review*, 9(2), 79-88.
- Chen, Q., Jiang, Y., & Li., Y. (2012). The state of the market and the contrarian strategy: evidence from China's stock market. *Journal of Chinese Economic and Business Studies*, 10(1), 89-108.

- De Bondt, W. F. M., & Thaler, R. (1985). Does the Stock Market Overreact? *Journal of Finance*, 40(3), 793-805.
- De Groot, W., Huij, J., & Zhou, W. (2012). Another look at trading costs and short-term reversal profits. *Journal of Banking & Finance*, 36(2), 371-382.
- Griffin, J. M., Ji, X., & Martin, J. S. (2003). Momentum Investing and Business Cycle Risk: Evidence from Pole to Pole. *The Journal of Finance*, 58(6), 2515-2547.
- Hameed, A., & Ting, S. (2000). Trading volume and short-horizon contrarian profits: Evidence from the Malaysian market. *Pacific-Basin Finance Journal*, 8(1), 67-84.
- Ince, O. S., & Porter, R. B. (2006). Individual Equity Return Data from Thomson Datastream: Handle with Care! *Journal of Financial Research*, 29(4), 463-479.
- Jegadeesh, N. (1990). Evidence of Predictable Behavior of Security Returns. *The Journal of Finance*, 45(3), 881-898.
- Jegadeesh, N., & Titman, S. (1993). Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency. *Journal of Finance*, 48, 65-91.
- Jegadeesh, N., & Titman, S. (1995). Overreaction, delayed reaction, and contrarian profits. *Review of Financial Studies*, 8(4), 973-993.
- Kahneman, D., & Tversky, A. (1979). Prospect Theory: an Analysis of Decision Under Risk. *Econometrica*, 47, 263-291.
- Kang, J., Liu, M.-H., & Ni, S. X. (2002). Contrarian and momentum strategies in the China stock market: 1993-2000. *Pacific-Basin Finance Journal*, 10(3), 243-265.
- Lee, D. D., Chan, H., Faff, R. W., & Kalev, P. S. (2003). Short-term contrarian investing--is it profitable? ... Yes and No. *Journal of Multinational Financial Management*, 13(4-5), 385-404.
- Lehmann, B. N. (1990). Fads, Martingales, and Market Efficiency. *The Quarterly Journal of Economics*, 105(1), 1-28.
- Lo, A. W., & MacKinlay, A. C. (1990). When are contrarian profits due to stock market overreaction? *Review of Financial Studies*, 3(2), 175-205.
- Moskowitz, T. J., & Grinblatt, M. (1999). Do Industries Explain Momentum? *The Journal of Finance*, 54(4), 1249-1290.
- Naranjo, A., & Porter, B. (2007). Including emerging markets in international momentum investment strategies. *Emerging Markets Review*, 8(2), 147-166.
- Ramiah, V., Cheng, K. Y., Orriols, J., Naughton, T., & Hallahan, T. (2011). Contrarian investment strategies work better for dually-traded stocks: Evidence from Hong Kong. *Pacific-Basin Finance Journal*, 19(1), 140-156.
- Wang, J., Burton, B. M., & Power, D. M. (2004). Analysis of the overreaction effect in the Chinese stock market. *Applied Economics Letters*, 11, 437-442.
- Zarowin, P. (1990). Size, Seasonality, and Stock Market Overreaction. *The Journal of Financial and Quantitative Analysis*, 25(1), 113-125