

การเปรียบเทียบ กลยุทธ์แบบตามตลาดโดยใช้ราคาสูงสุดในรอบ 52 สัปดาห์ ประกอบกับปริมาณการซื้อขาย
และ กลยุทธ์แบบตามตลาดโดยใช้ผลตอบแทนในอดีต ประกอบกับปริมาณการซื้อขายใน
ตลาดหลักทรัพย์แห่งประเทศไทย

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ลิขสิทธิ์ของจุฬาลงกรณ์มหาวิทยาลัย

THE COMPARISON OF VOLUME-BASED 52-WEEK HIGH PRICE MOMENTUM
AND VOLUME-BASED STOCK RETURN MOMENTUM STRATEGIES IN
THE STOCK EXCHANGE OF THAILAND.



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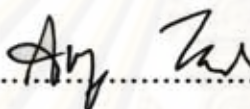
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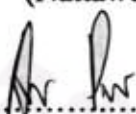
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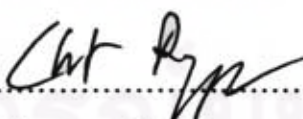

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พินมิกา ลักษณะนุญส่ง: การเปรียบเทียบ กลยุทธ์แบบตามตลาดโดยใช้ราคาสูงสุดในรอบ 52 สัปดาห์ ประกอบกับปริมาณการซื้อขาย และ กลยุทธ์แบบตามตลาดโดยใช้ผลตอบแทนในอดีต ประกอบกับปริมาณการซื้อขาย ในตลาดหลักทรัพย์แห่งประเทศไทย. (THE COMPARISON OF VOLUME-BASED 52 - WEEK HIGH PRICE MOMENTUM AND VOLUME-BASED STOCK RETURN MOMENTUM STRATEGIES IN THE STOCK EXCHANGE OF THAILAND) อ. ที่ปรึกษาวิทยานิพนธ์หลัก: ดร.ณัฐภูมิ เงิน วิทยาโรจน์, 62 หน้า.

วิทยานิพนธ์ฉบับนี้จัดทำขึ้นเพื่อเปรียบเทียบกลยุทธ์เพื่อการลงทุนระหว่าง กลยุทธ์แบบตามตลาดโดยใช้ราคาสูงสุดในรอบ 52 สัปดาห์ ประกอบกับปริมาณการซื้อขาย และ กลยุทธ์แบบตามตลาดโดยใช้ผลตอบแทนในอดีต ประกอบกับปริมาณการซื้อขาย ในตลาดหลักทรัพย์แห่งประเทศไทย จากข้อมูล ระหว่างปี 1988-2007 โดยหลักการซื้อหลักทรัพย์กลุ่มสูง (winner stocks) และขายหลักทรัพย์กลุ่มต่ำ (loser stocks) ซึ่งจัดกลุ่มดังกล่าวจากกลยุทธ์แบบตามตลาด สองวิธี คือ ใช้ผลตอบแทนในอดีต (JT) (Jegadeesh และ Titman, 1993) และ ใช้ราคาสูงสุดในรอบ 52 สัปดาห์ (George และ Hwang, 2004) วิจัยเพิ่มจาก Lee และ Swaminathan (LS, 2000) โดยกำหนดหลักทรัพย์ทดลอง โดยใช้ ปริมาณการซื้อขายในอดีต ประกอบกับกลยุทธ์ทั้ง 2 วิธี ซึ่งผลลัพธ์เป็นไปตามที่คาดไว้ กลยุทธ์แบบราคาสูงสุดในรอบ 52 สัปดาห์ มีอำนาจการลงทุนเหนือ กลยุทธ์แบบตามตลาดของ JT โดยให้ผลตอบแทนที่สูงกว่าไม่ว่ากลุ่มหลักทรัพย์ จะมีปริมาณซื้อขายระดับเท่าใดก็ตาม และ แสดงให้เห็นว่า ข้อมูลปริมาณการซื้อขายเมื่อพิจารณาควบคู่กับ กลยุทธ์แบบตามตลาด สามารถเพิ่มผลตอบแทนการลงทุนมากกว่าเดิม อย่างไรก็ตามกลยุทธ์แบบตามตลาดจะให้ผลตอบแทนมากในกลุ่มหลักทรัพย์ที่มีปริมาณการซื้อขายสูงมากกว่าค่า และเพื่อสร้างผลตอบแทนที่สูงสุด ควรซื้อหลักทรัพย์ที่มีปริมาณการซื้อขายสูงในกลุ่มสูง (Winner stocks) และขายหลักทรัพย์ที่มีปริมาณการซื้อขายสูงในกลุ่มต่ำ (Loser stocks) ท้ายสุด จากการวิจัยนี้ พบผลลัพธ์ที่สอดคล้องกับทฤษฎีการเปลี่ยนทิศทาง (Reversal) ของ GH (2004) และ LS (2000) นั่นคือ กลยุทธ์แบบตามตลาดของ JT มีการเปลี่ยนแปลงทิศทางในการลงทุนแบบระยะยาว และไม่พบการเปลี่ยนแปลงดังกล่าวใน กลยุทธ์แบบตามตลาดราคาสูงสุดในรอบ 52 สัปดาห์

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PEEMMICA LAKSANABOONSONG: THE COMPARISON OF VOLUME-BASED 52-WEEK HIGH PRICE MOMENTUM AND VOLUME-BASED STOCK RETURN MOMENTUM STRATEGIES IN THE STOCK EXCHANGE OF THAILAND. THESIS ADVISOR: NATTAWUT JENWITTAYAROJE, Ph.D., 62 pp.

This study presents the comparison of investment strategies between the volume-based 52-week high price momentum and the volume-based stock return momentum strategies in the Stock Exchange of Thailand (SET) over 20-year time horizon, spanning over 1988-2007, using the approach of buying past winner stocks and selling past loser stocks based on two momentum strategies; JT momentum (Jegadeesh and Titman, JT, 1993) and 52-week high price momentum strategies (George and Hwang, GH, 2004). Following Lee and Swaminathan (LS, 2000), the portfolios are formed based on the interactions of past trading volume and the momentum strategies. As expected, trading volume helps improve the momentum profitability, and the 52-week high price momentum significantly outperforms the JT momentum strategies in every category of trading volume stocks. In addition, the results are consistent with LS (2000) in that the momentum profit is higher in high volume stocks than low volume stocks. However, in contrast to LS (2000) who found that buying past low volume winners and selling past high volume losers was the most momentum profitability, we find that buying past high volume winners and selling past high volume losers gains higher future momentum returns in the SET. Finally, similar to the prior studies, the JT momentum portfolios experience long-term reversals in the next five years, while the 52-week high price momentum portfolios do not, regardless of whether or not the momentum strategies are based on the trading volume.

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CHAPTER I INTRODUCTION

1. Background of the Study

1.1 Classic Theoretical Model: The Efficient Market Hypothesis

A generation ago, the Efficient Market Hypothesis (EMH)¹ was widely accepted by academic financial economists; for example, Eugene Fama's (1970) influential survey article, "Efficient Capital Markets." It was generally believed that securities markets were extremely efficient in reflecting information about individual stocks and the stock market as a whole. When the information arises, the news spreads very quickly, effected into the prices of securities without delay. As it stated, if markets are efficient and current prices fully reflect all information, then buying and selling securities in an attempt to outperform the market will effectively be a game of chance rather than skill, no information or analysis can be expected to result in outperformance of an appropriate benchmark²

Thereafter, the theory of Efficient Markets is concerned with whether prices at any point in time "fully reflect" available information. However, the Theory had led to the new concept of **the random walk hypothesis**³, Fama (1974), which was because the stock market prices evolve according to a random walk and thus the prices of the stock market cannot be predicted. Also, Economists have historically accepted the random walk hypothesis. They have run several tests and continue to believe that stock prices are completely random because of the efficiency of the market.

¹ "An 'efficient' market is defined as a market where there are large numbers of rational, profit-maximizers actively competing, with each trying to predict future market values of individual securities, and where important current information is almost freely available to all participants. In an efficient market, competition among the many intelligent participants leads to a situation where, at any point in time, actual prices of individual securities already reflect the effects of information based both on events that have already occurred and on events which, as of now, the market expects to take place in the future. In other words, in an efficient market at any point in time the actual price of a security will be a good estimate of its intrinsic value."

² Appropriate benchmarks refer to comparable securities of similar characteristics. For instance, small stock fund performance is best compared to an index of small stocks and growth stock fund performance is best compared to a growth stock index.

³ The past history of the series cannot be used to predict the future in any meaningful way. The future path of the price level of a security is no more predictable than the path of a series of cumulated random numbers."

The concept was widely accepted up until the 1990s, when behavioral finance economists started disagreeing on the Theory. A new revolution of economists' emphasized psychological and behavioral elements of stock-price determination, create a new belief that future stock prices are predictable to some degree on the basis of past stock price patterns as well as a certain on the "fundamental" valuation aspects. Moreover, many of these economists started to investigate and produced substantial evidences that stock prices do not follow random walk and that predictable patterns enable investors to earn excess risk-adjusted rates of return.

1.2 The Challenging of the Behavioral Finance

The emerging of the behavioral economics and the behavioral finance has challenged the efficient market hypothesis, with the augment of un-rational market, driven by the investors' cognitive biases.

French and Roll (1986) establish their studies that the variance of stock prices is greater during trading hours than non trading hours. This is mainly due to noise created by uninformed investors which Black⁴ (1986) concluded. Price changes due to the noise effect, are eventually reversed inducing negative auto-correlations in daily returns, confirmed the predictable of daily and weekly returns, rejecting the classical market efficiency constant expect returns model.

Lo and MacKinlay (1988) and Conrad and Kaul (1988) discover weekly returns on portfolios of stocks, grouped according to size, show reliable positive auto correlation, which means the possibility to make consistent positive abnormal returns by holding these portfolios for a short time period with the greater returns coming from portfolios of small stocks.

However, the studies of DeBondt and Thaler (1985, 1987) created a particularly aggressive empirical attack to the theory of market efficiency. They have concluded that the market over-reacts to good / bad news. Investigated on five-year periods, the extreme loser firm becomes winner in subsequent period and the extreme winner firm become loser and gives the low return in the subsequent period.

Generally, price movements seem to be much greater than an efficient market would allow. For example, investors always are indifferent between dividends and capital gains. At the same time, most large companies do pay dividends.

⁴ Noise traders are those who "trade on noise as if it were information.... Noise makes financial markets possible, but it also makes them imperfect. If there is no noise trading, there will be very little trading in individual assets" (Black, 1986, p. 529-530)

Consequently, stock prices tend to rise when dividends are increased or initiated. The current literature treats dividends as yet another instance of signaling—companies that increase or initiate dividends send a signal of their financial health to the investors, Charlton and Hendershott (1998).

Finally, it seems that future returns can, at least partially, be predicted on the basis of various historic measures such as price-earnings and price-to-book ratios, earnings surprises, dividend changes, or share repurchases. Even though, many studies point out that the market can be predictable, however, good performance this year consistently fails to predict good performance next year and such a concept, that is discovered by DeBondt and Thaler (1985, 1987), lead to the important empirical evidence that is enable the traders to beat the market in some level.

1.3 Empirical Evidence of Behavioral Finance: The Momentum Anomaly

Jegadeesh and Titman (JT) (1993⁵, 1999) introduce momentum strategy that can argue the concept of EMH and largely explain the financial market trends, is the empirically observed tendency for rising asset prices to rise further. For instance, it was shown that stocks with strong past performance continue to outperform stocks with poor past performance in the next period with an average excess return of about one percent per month. That is because positive information tends to be followed by the positive information and vice versa. Therefore, the positive earning stock tends to be followed by more positive earnings in the next month and vice versa.

Later in year 2000, Lee and Swaminathan support the momentum strategy of Jegadeesh and Titman (1993, 1999) and further combine the strategy with the trading volume, perform the better return predictability to the momentum strategy. Additionally, they discover that trading volume can provide information useful to locate the given stock in the Momentum Life Cycle (MLC), contained the simple conceptual and the interaction between price momentum, reversal, and the trading volume.

A while later, George and Hwang (2004), argue the momentum strategy of Jegadeesh and Titman with the strategy of 52-week high price momentum strategy, which significantly explain original momentum return. The strategy suggests that

⁵ —A self-financing strategy that buys the top 10% and sells the bottom 10% of stocks ranked by returns during the past 6 months, and holds the positions for 6 months, produces profits of 1% per month.”

price *levels* are more important determinants of momentum effects than are past price changes.

According to the prior momentum studies, I draw my attention on the latest one, the 52-week high price momentum strategy, combining it with the trading volume, which raise the questions whether volume-based 52-week high price momentum strategy can improve the original momentum profitability in the Stock Exchange of Thailand (SET).

2. Objectives of the Study and Research Questions

This thesis has three key objectives. First, it is aimed at investigating whether the two momentum strategies – namely, JT (stock return) momentum strategy and 52-week high price momentum strategy, are profitable in the SET. Second, this study examines the interaction between past trading volume and the momentum strategies. Specifically, it is intended to examine whether past trading volume helps improve the profitability of those two momentum strategies. Finally, this study compares the profitability of the two volume-based momentum strategies – that is, volume-based 52-week high price momentum and volume-based JT momentum strategies

The Stock Exchange of Thailand is characterized by a different structure and has experienced increasingly growth in trading volume in recent years. It would be useful for both academics and practitioners to investigate momentum strategies in such a market. This paper is the first study to explore these investment strategies in the particular market.

3. Hypothesis

According to my objective, I prove whether momentum strategies exist in the SET. From my study, they strongly exist in the market in short-intermediate term. Basically, once a momentum trader sees an acceleration in a stock's price, earnings, or revenues, the trader will often take a long or short position in the stock with the hope that its momentum will continue in either an upwards or downwards direction. Generally as seen in the local issues, Thai traders mostly believe that there are momentum returns in the stock market, mentioned and analyzed in many money magazines and the financial section in the newspapers.

Along with George and Hwang (2004), the nearness to the 52-week high is a better predictor of future returns than are past returns, based on the JT momentum strategy, and that nearness to the 52-week high has predictive power whether or not

stocks have experienced extreme past returns. However, the dominance of the strategy not only take place in New York Stock Exchange but also is found and accepted by several stock markets such as Marshall and Cahan (2005) in the Australian Securities Exchange, Ding Du (2008) in 18 Asian Developed Market, and the latest with Alsubaie and Najand (2009) in the Saudi Stock Market. They find that the 52-week high momentum strategy outperforms the price momentum of Jegadeesh and Titman (1993) and the industry momentum of Moskowitz and Grinblatt (1999).

From the evidences, they pointed out that the strategy of 52-week high price momentum not only explains the momentum profitability in U.S. but also in the international market. Therefore, it raises the expectation as

Hypothesis 1: the 52-week high price momentum strategy significantly outperforms the JT (stock return) momentum strategy in the Stock Exchange of Thailand (SET).

In the present day, data from the SET is used to test my first hypothesis and discover whether both strategies of momentum can forecast the future returns on the SET. Evidently, many research showed that 52-week high price momentum can reflect the financial market better than JT momentum strategy. However, this is the first paper that discovers the 52-week high price strategy also explain profitability in the SET.

In addition, the 52-week low price momentum strategy is aim to be considered in the research. The 52-week low price is as readily a statistic as the 52-week high price, and could also serve as an anchor in how investors form their beliefs as a reverence point. Therefore, if the theory of George and Hwang is correct,

Hypothesis 2: the 52-week low price momentum strategy is profitable in the Stock Exchange of Thailand (SET).

According to the hypothesis, the data of the lowest stock price in 52-week is needed to manage. The result indicates that the return based on the strategy of 52-week low is not profitable and we do not have an explanation grounded in experimental studies that indicates why investors should favor a stock's 52-week high as an anchor over its 52-week low.

Then, this study examines the interaction between past trading volume and the momentum strategies – that is, volume-based JT's price momentum strategy and the volume-based 52-week high price momentum strategy, whether they have a

significant role in the Momentum Life Cycle (Lee and Swaminathan, 2000) and whether the trading volume provide information useful in improving the momentum profitability.

Since, Lee and Swaminathan (LS, 2000) discovered the important empirical evidence that the price momentum reported by Jegadeesh and Titman (1993) eventually play a role in prediction of cross-sectional stock returns based on past trading volume. Therefore, they suggest that trading volume provides information on the degree of investor favoritism or neglect in a stock. The investor expectations affect not only a stock's returns but also its trading activity. To this point, it leads to the following,

Hypothesis 3: Trading volume provides information useful to improve the momentum profitability.

With the particular hypothesis, the data of trading-volume turnover and the number of share outstanding at the day-ended are needed to capture from DATASTREAM.

However, the research of George and Hwang (GH, 2004), claim to dominate the studies of basic price momentum (Jegadeesh and Titman, 1993) and are proved to be practical in many countries. Together with the finding of Lee and Swaminathan (2000), momentum returns are more pronounced among high volume stocks than low volume stocks over the next 12 months. Therefore, it stands to the logical reason that, if the 52-week high price momentum significantly outperform the JT momentum strategy then, with the combining of trading volume, leading to the following hypothesis,

Hypothesis 4: The volume-based 52-week high price momentum strategy significantly outperforms the volume-based JT momentum strategy.

According to the results, the evidence shows that volume-based 52-week high price momentum outperforms the volume-based JT momentum strategies in the Stock Exchange of Thailand (SET).

CHAPTER II

LITERATURE REVIEW

Jegadeesh and Titman (1993) found Trading strategies that buy past winners and sell past losers realize significant abnormal returns and examine the momentum strategy in the US equity market from 1965 to 1989 and find that stock returns exhibit momentum behavior at intermediate horizons. Self-financing strategies that buys the top 10% and sells the bottom 10% of stock ranked by return of the past 6 months, and hold the positions for the past 6 months, produces profits of 1% per month, which is statistically significant abnormal profit. Although, these results have been provided and significantly proved the un-rational of the market, the predictable of the returns, there were some arguments about the limited of the data availability, which could mislead the interpretation results.

Consequently, Jegadeesh and Titman (1999) documented the momentum profits in the eight years subsequent to their prior studied and found the remarkably similar patterns of the profits, as in the earlier time. Their evidence presents the performance of the momentum portfolio, in the 13 to 60 months following the portfolio formation month, to be negative, which means that it can be predicted the reversal in the long term.

Lee and Swaminathan (2000) introduce the effect of trading volume on the profitability of price momentum and find a strong relation between past returns and past trading volume that increases predicative power of future returns over an intermediate horizon. Using all firms listed on the NYSE and the AMEX from January 1965 through December 1995, they find that price momentum (winners-losers) is more pronounced for high volume firms than for low volume firms. They interpret their result as buying high volume winners do not enhance price momentum as much as selling high volume losers. Generally, when a stock falls into disfavor, its trading volume declines. Conversely, when a stock is popular, its trading volume increases. Specifically, they provide strong evidence that low (high) volume stocks tend to be under- (over) valued by the market. This evidence includes past operating and market performance, current valuation multiples and operating performance, and future operating performance and earnings surprises. The investor expectations affect not only a stock's returns but also its trading activity.

George and Hwang (2004) add a new finding to the momentum literature by investigating the role of a readily available piece of information—the 52-week price

high—on momentum profitability. They utilize all stocks in the Center for Research in Security Prices (CRSP) database from 1963 to 2001 and show that a strategy of purchasing stocks near their 52-week price high and selling stocks far from their 52-week price high largely explains the momentum profit and is even more profitable than Jegadeesh and Titman's (1993) momentum strategy. They find that the predictive power of the nearness of the price to the 52-week high is strong whether or not the stocks have experienced extreme past returns. They interpret this result to mean that traders use the 52-week high as a reference point against which they evaluate the potential impact of news. "When good news has pushed a stock's price near to a new 52-week price high, traders are reluctant to bid the price of the stock higher even if the information warrants it. The information eventually prevails and the price moves up, resulting in a continuation. Similarly, when bad news pushes a stock price far from its 52-week high, traders are initially unwilling to sell the stock at prices that are as low as the information implies. The information eventually prevails and the price falls".

Marshall and Cahan (2005) apply the same test to the stocks listed on the Australian stock exchange from 1990 to 2003. Similar to George and Hwang (2004), they find that the 52-week high momentum strategy in the Australian market outperforms the price momentum of Jegadeesh and Titman (1993) and the industry momentum of Moskowitz and Grinblatt (1999). Specifically, they find that the 52-week price high strategy generates returns of 2.14% per month, as compared with 0.59% and 0.16% for the price and industry momentums, respectively.

Chui, Titman, and Wei (2000) examine the momentum strategy in eight Asian countries for various time periods and find momentum profits to be higher in stocks with high turnover ratios in five of these countries. They also find that when a country-neutral momentum strategy (no specific country momentum) is employed, momentum profits are five times higher among high-turnover stocks than among low-turnover stocks.

Ding Du (2007) performed similar tests as George and Hwang (2004) with the MSCI country indexes. They used the country portfolios with firm-specific risk generally eliminated, but it still has country-specific idiosyncratic risk. They found that international momentum strategies are profitable even after risk and transaction-cost adjustments. Furthermore, although nearness to the 52-week also dominates past returns in terms of predictive power in international stock markets, reversals do occur to both the momentum profits from the JT strategy and those from the GH strategy.

Taken together, these findings confirmed that an anchor-and-adjust bias might be a better description of investor behavior.

Alsubaie and Najand (2009) document the existence of a pure momentum strategy in the SSM. Price momentum profitability in the SSM is very similar in magnitude and significance to these found in developed market. They also find that trading volume affects the profitability of a momentum strategy. One explanation for the pure momentum profit is investor under-reaction: stock prices rise when good news hits the market and will continue to rise after the market fully adjusts to public information. The opposite is true with bad news. The under-reaction of investors lengthens this continuation of return. The 52-week high price result contradicts the empirical result of George and Hwang (2004) for the US market. They indicate a reversal in stocks that have reached their 52-week high. One possible explanation of the different result obtained here for the SSM compared to the results for well developed financial markets such as US can be attributed to the diffusion of information and investors overreaction. Stocks might reach their 52-week high price because investors speculation moves the price to their 52-week high; however, when more accurate news reaches the market, the stocks drop below their 52-week high price.

CHAPTER III

SAMPLE DATA AND METHODOLOGY

1. Sample Data

The sample consists of all firms listed on the SET during the period January 1988 through December 2007 with at least two years of data prior to the portfolio formation date, separating out the crisis period from 1997-2000. Finally, to be included in the sample, a stock must also have available information on past returns, trading volume, share outstanding at day-ended, market capitalization, and stock price.

2. Methodology

2.1 Momentum Strategies

Use all stocks on the SET, performed in two momentum strategies; the JT (stock return) momentum strategy (Jegadeesh and Titman, 1993) (hereafter JT) and 52-week high price momentum strategy (George and Hwang, 2004).

2.1.1 JT momentum strategy

At the beginning of each month, stocks are ranked from the highest average monthly return to the lowest average monthly return over the formation period J . Three equally weighted portfolios are formed based on these rankings. The top 30% of stocks in the ranking are used to construct the winner portfolio, the bottom 30% are used to construct the loser portfolio, while the rest, the middle 40% are designated the middle portfolio. The stocks in the winner (loser) portfolio are then bought (sold) at the next month's open price. This creates a self-financing winner minus loser portfolio. The portfolios are then held for K periods and sold at the close price at the end of the last month. The strategy is named a (J, K) strategy after the formation and the holding period length. The buy-and-hold, average monthly returns over the holding period are calculated using the following formula:

$$\text{Average monthly Stock Return} = \frac{((P_{i,t-1} / P_{i,t-1-j}) - 1)}{j} \times 100$$

Where

- $P_{i,t-1}$ = end of month close price for a stock i
 $P_{i,t-1-j}$ = close price at the end of the j^{th} previous month
 j = formation period length in months.

2.1.2 52-week high price momentum — GH.

For the 52-week high momentum strategy, follow the methodology used by George and Hwang (2004). The first step in the strategy involves determining the nearness to the 52-week high price. This is calculated for each stock at the beginning of each month using the following formula:

$$\text{Ratio of nearness to the 52 - week high price} = \frac{P_{i,t-1}}{high_{i,t-1}}$$

However, the *52-week low price momentum* is considered in the investigation, to witness whether the strategy can explain profitability in the Stock Exchange of Thailand, following the above mythology of George and Hwang (2004), by changing from the *highest price* of the stock to become the *lowest price* of the previous 12-month period. This is calculated for each stock at the end of each month using the following formula:

$$\text{Ratio of nearness to the 52 - week low price} = \frac{P_{i,t-1}}{low_{i,t-1}}$$

Where

- $P_{i,t-1}$ = the closing price of the stock i at the end of the month
 $high_{i,t-1}$ = the highest price of the stock i during the previous 12-month period (52-week high) that ends on the last day of the month.
 $low_{i,t-1}$ = the lowest price of the stock i during the previous 12-month period (52-week low) that ends on the last day of the month.

To begin with the 52-week high price momentum portfolios, the stocks are then ranked according to above ratio, starting from stocks with the highest ratio (closest to the 52-week high price) to those with the lowest ratio (furthest from the 52-week high price). The next step is to construct equally weighted portfolios where the top 30% of the ranked stocks represents the winner portfolio, and the bottom 30%

represents the loser portfolio. The remaining 40% constitute the middle portfolio. The holding period are calculated in a similar fashion as JT momentum strategy. The monthly returns of JT's (J, K) strategy and the 52-week high strategy are obtained the same way. The only difference is that stocks are ranked using different measures of past performance. For JT's strategy, stocks are ranked based on their own individual returns over months $t - 6$ to $t - 1$.

However, I work on 52-week low price in the same way as the 52-week high price strategy; begin with the stocks that have lowest ratio (closest to the 52-week low price). Then follow the process of categorizing the winner and loser portfolio by 30% as a top ranked stocks are winner, 30% bottom are loser, and the remaining of 40% are the middle portfolio. After that, perform the process in the same way as 52-week high price strategy.

Focus the above discussion of 3 momentum strategies comparison on (J, K) strategies, which $J = 3, 6, 9$, or twelve months and $K = 3, 6, 9$, or twelve months, enable us to simultaneously understand the performance of momentum anomaly in the Stock Exchange of Thailand (SET).

2.2 Volume-Based Momentum Strategies

I tend to investigate the comparison between the volume-based JT's individual stock price momentum strategy and the volume-based 52-week high price momentum strategy, whether one can give a better forecasting in short-intermediate future return. Follow the methodology used by Jegadeesh and Titman (JT, 1993) and Lee and Swaminathan (LS, 2001).

At the beginning of each calendar month, all stocks are ranked and grouped into three portfolios on the basis of their returns over the previous three, six, nine, and 12 months. The results are reported for the bottom 30% portfolio of extreme losers (R1), the top 30% of extreme winners (R3), and one intermediate portfolio (R2). A self-financing of buying extreme winner and selling extreme loser portfolio (R3-R1) represents momentum strategy, using two momentum strategies approach; past return (JT) and the nearness to the 52-week high ratio (GH), using the formula that is mentioned in the previous sub-content. Consistently with the report of equal-weighted average monthly returns over the next K months ($K = 3, 6, 9$, and 12)

Trading volume (*Volume*) is defined as the average daily turnover in percentage during the portfolio formation period, where daily turnover is the ratio of

the number of shares traded each day to the number of shares outstanding at the end of the day⁶.

The stocks are then independently sorted based on the average daily volume over the past J months and divided into three portfolios, where I use turnover as a proxy of trading volume. V1 represents the lowest trading volume portfolio, and V3 represents the highest trading volume portfolio. The stocks at the intersection of the two sorts are grouped together to form portfolios based on past returns and past trading volume. Also, I show the number of t -statistics to prove whether the strategies are significant.

Additional suggestion, the data of free float should be used to consider in the research, because it is shares of a public company that are freely available to the investing public, giving the unbiased results of the momentum existence in the SET. However, according to the insufficient information providing, the free float data had been officially provided only since 1992, which doesn't cover the time horizon of the thesis research. Therefore, I use only the information about the trading volume that officially provided on the DATASTREAM.

2.3 Transaction Costs

The transaction costs explanation suggests that momentum profits will dissipate faster for large stocks, which are cheaper to trade, and that because of the costs of short-selling, the profits from trading past winners should be eliminated more quickly than the profits from trading past losers. These predictions are not supported by the data. However, from a practical investment perspective, it is important to assess whether the relative strength strategies are profitable after accounting for transaction costs. On average, the trading cost in Thailand is about 0.25%, which I conservatively assume to be 0.5% per trade as a factor.

3. The Stock Exchange of Thailand (SET)

The history of the SET dates back to July 1962, when a private group established an organized stock exchange as a limited partnership, and in year 1963, it was named as “Bangkok Stock Exchange Co., Ltd.”, (BSE). However, with the lack of official government support and a limited investor understanding of the equity market, the BSE was inactive with the annual turnover value poorly declining in every

⁶ Some of previous studies have used turnover as a measure of the trading volume in a stock (see Campbell et al. (1993)).the reason is raw trading volume is un-scaled and, therefore, is likely to be highly correlated with firm size.

year. Consequently, the BSE finally ceased operations in the early 1970s. In 1972 the Government took a further step in controlling and providing regulation over the operations of finance and securities companies, which until then had operated fairly freely. In May 1974, long-awaited legislation establishing "The Securities Exchange of Thailand" (SET) was enacted and on April 30, 1975, "The Securities Exchange of Thailand" officially started trading. On January 1, 1991 its name was formally changed to "The Stock Exchange of Thailand" (SET).

However, the SET has been officially open to the public trading for almost 34 years, which is still a young market, comparing to many other countries that have trading stock market for a longer time ago, and they are quite a stable stock market. To get a better view of finding Momentum in Thailand stock market, sample-period are categorized in to three sub-sample periods based on the market condition.

From the publication of Set Note⁷, issue no.5/2006, it reports the study and the research about the financial instruments that most gain the profit in Thailand from year 1975 to year 1995, which were equity, bond, cash, and gold. However, the publication has officially reported the trend categories of SET in 3 phases, base on the crisis in year 1997. Therefore, I decide to use the same categories over the momentum research on the SET, in order to maintain the standard of the period categorization.



Figure 1: illustrates the monthly market index value for period from January 1998 to December 2008.

⁷ Withan Charoenpon, 2006, the financial securities that gave the most profit in 30 years, Set Note, issue5/2006, 1-13.

There are many circumstances that affect the market to create trends and variations, which impacted the stock index and price. However, information was the particularly important factor that conveyed the investors to make decisions on the investment.

3.1 Pre-crisis (1988-1996)

Refer to the incident of “Black Monday”⁸, October 19, 1987, later from that time, the SET index enormously climbed to 1,100 point, because the foreign investors sold stocks back and started to find another reliable market, especially emerging market, to invest in, which that time, SET became one of the most interesting market among others. In year 1990, there was the “Persian Gulf War Crisis”⁹ that made an impact on the stock index to decline down more than 500 points. However, the war was over in year 1991; the stock price in Thai market was back to a normal condition and increased in good pace until the “Black May”, the incident in May 1992, the violent political confliction between Thai government and the local people, which affected the stock price to fall again but this time was not seriously damaged as it used to be because local institution, foreign investors, and individual investors still continue entering the market with the beliefs that Thai economy was expanding and uncatchable. This made the stock index climbing up to the highest point of the financial history of Thailand, to be at 1763.78 points with the around THB 40 billion per one trading day. January 4th, 1994, the traders were satisfied with the big amount of profit that came in hand easily. Financial analysis made the prediction that the stock index would definitely continue up and might touch 2,000 points in the next years.

3.2 Crisis (1997-2000)

After the stage of market booming of time, Thai stock market entered the status of bearish condition in a long session. The index of Thailand stock market started declining continually when the truth underneath was revealed that the Thai economy was not prosperous as it was shown, only a delusion. Foreign investors became more aware and sold the cheap stock back continuously for a long time. The market declined steadily down until July 1997, which was a big impact economic

⁸ It is the time that stock markets around the world crashed, shedding a huge value in a very short period. The crash began in Hong Kong, spread west through international time zones to Europe, hitting the United States after other markets had already declined by a significant margin. SET index went down to the bottom at 284.94 point at the end of that year.

⁹ The **Persian Gulf War** or **Gulf War** (2 August 1990 – 28 February 1991) was a United Nations-authorized military conflict between Iraq and a coalition force from 34 nations commissioned with expelling Iraqi forces from Kuwait after Iraq's occupation and annexation of Kuwait in August of 1990.

crisis to the stock market. The economic crisis¹⁰ known as “Tom Yum Kung Disease” caused more than fifty financial institutions in Thailand to collapse. The crisis stemmed from the rapid expansion in real estate, construction and financial sectors that generated over-investment and a high level of external short-term loans. Also, the crisis partly erupted from the fraudulent activities and malpractices in the financial institutions and stock market. The crisis erupted when export slowed and the country lacked cash-flow. To resolve the problems, the Thai government sought help from the International Monetary Fund (IMF) and the international community, particularly from Southeast Asian nations and Japan. All these made the index of SET came down to the bottom of the financial history of Thailand stock market.

In 1998, the stock market index and trading volume decreased continuously during the first three quarters of the year, reflecting poor profitability of listed companies, particularly commercial banks. September 4th, the index left only 207.31 points and many stocks became worthless.

In the year 1999, the market continued improvement of the economic performance. In year 2000, the market had total market value at 2,100 billion THB and the stock index a little bit climbing up at around 300 points. Thai economy in this year was still continually recovering from year 1999. The growth in the second half of this year moderated somewhat in line with private consumption and overall investment.

3.3 Post-Crisis (2001-2008)

The market after the crisis started to regain the confidants from the investors. In year 2003¹¹, there was the continued improvement in the Thai economic performance, with concomitant expansions in private spending and exports, induced large capital inflows into the Thai stock market, which led to a shift of investment from bonds to stocks. Nevertheless, the baht was quite volatile and depreciated periodically during the first half of the year due to concerns about the US-Iraqi War and the outbreak of SARS as well as the corresponding adjustment to movements of regional currencies, especially the Japanese yen. In year 2004, the SET still continually stayed in the rising status in foreign investments. The baht strengthened over the course of the year and averaged at 40.28 baht per US dollar, despite the affected by the outbreak of avian flu (SARS).

¹⁰ Sookying, 126Th International Senior Seminar Participants' Papers, 171-178

¹¹ Thailand's Economic and Monetary Condition in Year 2004, 1.1.2

In year 2007, there was the increase in the Stock Exchange of Thailand in the major telecommunication group; therefore the surprisingly slowdown of FDI (foreign Direct Investment) from the 2006 level. Capital rising through equity securities declined sharply in mid-2007 as firms postponed their investment activities when the economy weakened and the political condition became uncertain. This slowdown was reflected by the decrease in the number of initial public offerings (IPO) in the Stock Exchange of Thailand, which fell from 36 and 12 in 2005 and 2006, respectively, to 7 in 2007. Firms that tapped the equity market were mainly in the property and communication sectors.

In year 2008, there were many incidents that happened and affected the Stock Exchange of Thailand directly and indirectly, such as the spreading in of the Subprime crisis, the political uncertainty, the violent of the political mob, and the Financial Meltdown crisis. The stock market was in a descending status which was the same direction as the other countries in the world, lost 162 billion THB from the foreign investors. The stock index was fallen down around 441 points to be at 416.53 points on October 31th, or 56.41% with the loss of 3,320 billion THB in market capital. However, many Thai stock analysts pointed out the main factor that had a big impact on the stock market was the political aspect conflictions, led to the unite of violent mobs.

These categories would give a better view in the section of robustness test. Therefore, the next section presents the empirical results of the research.

CHAPTER IV EMPIRICAL RESULTS

In this section, discuss the empirical results and the performance of various momentum strategies; the JT (stock returns) momentum (Jegadeesh and Titman, 1993), 52-week high price momentum (George and Hwang, 2004), volume-based stock returns momentum (Lee and Swaminathan, 2000), and the thesis contribution of volume-based 52-week high price momentum strategy.

In Subsection A, confirm the momentum evidence of JT and 52-week high price momentum strategies for the sample stocks over the sample period, separated out the crisis period. In Subsection B, introduce the interaction of trading volume and the momentum strategies. In Subsection C, provide results of robustness checks for the various momentum strategies, in order to ensure the momentum results are not driven by any causes in different periods or by a few small stocks. Finally, in Subsection D, provide results from the cross-sectional regressions, which control for the effects of firm size, book to market, and enable us to compare all momentum strategies simultaneously. Long-horizon returns also are examined in the regression to investigate the timing of the reversals.

1. Momentum Strategies

Table I and II reports the average monthly portfolio returns from January 1988 through December 2007, separating out the crisis period, spanning over 1997-2000, for two different momentum investing strategies. For each portfolio, both Tables also report the mean return, the daily average in monthly of the median volume, the average monthly median size, and the monthly average of the median stock price during the portfolio formation period based on the SET.

1.1 JT Momentum Strategy

According to the result provided on Table I, there is an evidence of momentum appearance in every portfolio of the JT momentum strategy.

At the portfolio formation date, the *Size* (column 5) and *Price* (column 6) in the winner portfolios are larger and higher than the stocks in loser portfolios. The *Return* (column 3) in winner portfolios is higher than the *Return* in the loser portfolios. For example, for the six-month formation period ($J = 6$), losers lost an average of 4.01 percent per month over the past six months, whereas winners gained 8.31 percent per month in stock return momentum portfolio.

The figures in Columns 4 report trading volume as *Volume*. Consistent to the study of Lakonishok and Smidt (1986), trading volume is positively correlated with absolute returns, thus the extreme winner exhibits higher trading volume¹². For example, the average daily turnover for the R1 and R3 stock returns momentum portfolios in the six-month portfolio formation period is 1.91 percent and 2.90 percent, respectively.

Columns 7 through 10 report equal-weighted average monthly returns over the next K months ($K = 3, 6, 9, 12$). In addition, for each portfolio formation period (J) and holding period (K), report the mean return winners, losers, and self-financing, which is buying the extreme winners and selling the extreme losers ($R3 - R1$). These results confirm the momentum profits in portfolio. For example, with a six-month JT momentum portfolio formation period ($J = 6$), past winners gain an average of 1.24 percent per month over the next nine months ($K = 9$). Past losers lost an average of only 0.43 percent per month over the same time period. The difference between R3 and R1 is 1.67 percent per month and also is significantly positive in all (J, K) combinations in the portfolio strategies.

The last five columns of Table I report the annual event-time returns for each portfolio for five 12-month periods following the portfolio formation date. Year 1, the R3 - R1 portfolio yields a statistically significant return of between 11.96 percent and 16.41 percent per year. When extending the event time to Years 2, 3, 4 and 5, a pattern of price reversal begins to emerge in the portfolio strategy. The last four columns show that R3 - R1 returns are negative in Years 2, 3, 4 and 5 for all formation periods. The reversal pattern becomes significantly stronger as the formation period (J) increases.

¹² —Winners and losers in the game of stock trading and transfer are discussed; winners are traders whose stocks have increased in value, while loser stocks are those that have failed to increase (or have, in fact, decreased) in value. The examination of trading activities for both groups of stock indicates that: the capital gains tax is often the incentive behind trading, turnover is higher for winner stocks (despite taxation predictions), and that increased turnover for the months of December and January is indicative of the tax incentives behind such trading. Although higher taxes can influence turnover, stock trading itself is motivated more by other factors.



Table I
Individual Stock Returns Momentum Portfolios

This table presents average monthly and annual returns in percentages for JT's individual stock returns momentum portfolio strategies involving SET stocks for the time period from 1988 to 2007, by separate out the crisis period, which spanned over 1997-2000). At the beginning of each month starting in January 1988, all stocks in the SET are sorted based on their previous J months' returns and divided into 3 equal-weighted portfolios. $R1$ represents the *loser* portfolio with the lowest returns, and $R3$ represents the *winner* portfolio with the highest returns during the previous J months. K represents monthly holding periods where $K=$ three, six, nine, or 12 months. Monthly holding period returns are computed as an equal-weighted average of returns from strategies initiated at the beginning of this month and past months. The annual returns (*Year 1*, *Year 2*, *Year 3*, *Year 4*, and *Year 5*) are computed as event time returns for five 12-month periods following the portfolio formation date. *Return* refers to the geometric average monthly return in percentages, and *Volume* represents the average daily turnover in percentages, both measured over the portfolio formation period, J . *Size* represents the time-series average of the median size on the portfolio formation date. *Price* represents the time-series average of the median stock price of the portfolio in THB on the portfolio formation date. The numbers in parentheses represent t -statistics.

<i>J</i>	Portfolio	<i>Return</i>	<i>Volume</i>	<i>Size</i>	<i>Price</i>	Monthly Return				Annual Event Time Returns				
						<i>K</i> = 3	<i>K</i> = 6	<i>K</i> = 9	<i>K</i> = 12	Year 1	Year 2	Year 3	Year 4	Year 5
3	R1	-4.80	2.3382	4684.96	47.948	0.21 (0.77)	0.87 (2.97)	0.61 (2.44)	0.27 (1.26)	3.16 (1.26)	15.18 (4.98)	13.04 (4.90)	11.73 (4.53)	12.78 (4.90)
	R2	0.06	1.5821	5554.28	53.188	0.95 (3.40)	1.84 (6.39)	1.99 (7.46)	1.74 (8.98)	20.03 (7.68)	25.07 (9.37)	13.95 (6.31)	20.24 (8.83)	18.41 (6.38)
	R3	7.90	2.7275	6455.39	56.246	0.97 (3.46)	1.69 (5.85)	1.44 (5.42)	0.95 (4.90)	15.12 (5.80)	12.38 (4.63)	9.58 (4.33)	9.32 (4.07)	12.43 (4.31)
	R3-R1					0.76 (1.93)	0.82 (2.00)	0.83 (2.30)	0.67 (2.34)	11.96 (3.31)	-2.80 (-0.70)	-3.46 (-1.02)	-2.41 (-0.70)	-0.34 (-0.09)
6	R1	-4.01	1.9111	4050.69	47.320	-0.71 (0.50)	-0.68 (2.57)	-0.43 (1.42)	-0.26 (1.52)	0.68 (0.82)	15.10 (5.20)	9.81 (2.98)	22.61 (5.59)	23.40 (5.85)
	R2	0.22	1.9255	5690.93	53.246	0.23 (3.21)	0.00 (5.32)	0.27 (6.98)	0.35 (8.81)	22.75 (7.54)	21.63 (7.83)	13.23 (5.81)	35.00 (4.75)	28.90 (6.52)
	R3	8.31	2.8985	6954.14	51.070	0.68 (3.42)	1.43 (5.83)	1.24 (5.01)	0.60 (4.73)	14.90 (4.71)	9.83 (3.67)	3.18 (1.20)	15.85 (4.14)	16.47 (3.80)
	R3-R1					1.39 (1.99)	1.46 (2.44)	1.67 (2.63)	0.79 (2.50)	14.22 (3.03)	-2.90 (-1.21)	-6.60 (-2.02)	-6.80 (-2.00)	-6.92 (-1.21)
9	R1	-3.33	2.1801	3660.03	51.071	0.22 (0.66)	0.07 (0.23)	0.36 (1.55)	0.41 (1.70)	4.59 (1.31)	15.27 (6.09)	18.74 (5.14)	17.68 (4.78)	17.65 (6.14)
	R2	0.24	1.8821	5615.36	53.349	0.90 (2.63)	1.48 (4.37)	1.90 (7.20)	2.24 (7.68)	32.39 (7.37)	19.16 (8.09)	12.56 (4.88)	12.55 (3.89)	20.10 (7.25)
	R3	7.95	2.6509	7012.78	65.402	1.27 (3.72)	1.31 (3.86)	1.28 (4.83)	1.26 (4.30)	20.29 (4.61)	11.42 (4.82)	7.85 (3.05)	8.35 (2.59)	11.48 (4.14)
	R3-R1					1.05 (2.21)	1.24 (2.78)	0.92 (2.65)	0.84 (2.26)	15.70 (2.87)	-3.85 (-1.42)	-10.89 (-2.58)	-9.33 (-2.13)	-6.17 (-1.55)
12	R1	-2.74	1.8658	3854.99	44.640	-0.44 (-1.49)	0.11 (0.38)	0.40 (1.58)	0.62 (2.53)	6.49 (1.84)	12.55 (4.77)	19.20 (5.11)	18.77 (5.65)	20.11 (6.21)
	R2	0.30	1.8731	5427.10	54.606	0.73 (2.44)	1.53 (4.61)	2.09 (6.63)	2.26 (7.20)	34.51 (7.20)	19.82 (8.60)	12.34 (4.90)	14.03 (5.42)	17.29 (5.79)
	R3	7.82	2.7395	7558.23	88.255	0.85 (2.85)	1.31 (3.94)	1.50 (4.76)	1.45 (4.63)	22.90 (4.78)	8.14 (3.53)	7.89 (3.13)	9.54 (3.68)	10.97 (3.67)
	R3-R1					1.29 (3.09)	1.20 (2.80)	1.10 (2.76)	0.84 (2.18)	16.41 (2.89)	-4.41 (-1.57)	-11.31 (-2.68)	-9.23 (-2.26)	-9.14 (-2.09)

1.2 52-Week High Price Momentum Strategy

According to the result provided on Table II, Panel A and B, presents the result based on the 52-week high price and the 52-week low price momentum strategy, respectively. The *Size* and *Price* in the winner portfolios are larger and higher than the stocks in loser portfolios. The *Return* in winner portfolios is higher than the *Return* in the loser portfolios. For example, Panel A, the losers lost an average of 1.41 percent per month over the past six months, whereas winners gained 8.8 percent per month in 52-week high price momentum portfolio strategy.

The results *Volume 4* confirm the consistently similar pattern as presented in the prior studies which, trading volume is positively correlated with absolute returns, so that the extreme winner exhibit higher trading volume. For example, in Panel A, the average daily turnover for the R1 and R3 in 52-week high price momentum portfolios in the six-month portfolio formation period is 2.39 percent per month and 2.56 percent per month, respectively.

According to the average monthly returns reports the presence of momentum emergence in intermediate term horizon. For example, in Panel A, past winners gain an average of 1.5 percent per month over the next nine months ($K = 9$). Past losers lost an average of only 0.26 percent per month over the same time period. The difference between R3 and R1 is 1.8 percent per month with the statistically significant of 4.21. The difference in average monthly returns using 52-week high strategy, between R3 and R1 is significantly positive in all holding periods.

However, the returns from the 52-week low price portfolios don't show any pattern of the momentum profit in any periods. A possible explanation is the 52-week low winner has a unique feature that is not shared by 52-week high winner – identifies those stocks with the largest potential short-term capital gains. Price of stocks that are winners relative to the 52-week low may tend to be above their fundamental values. When this pricing error is corrected, the reversal might offset whatever momentum is associated with investors having used the 52-week low as an anchor

The annual event-time returns for each portfolio in the last five columns of Table II report annual returns in the next one to five years. When extending the event time to Years 2, 3, 4 and 5, the results are consistent with George and Hwang (2004); there is no occurrence of the price reversal in both 52-week high/low price momentum portfolio strategies in any holding period, supporting the idea of separating phenomenon between short-term momentum and long-term reversal.

Table II

Returns of the 52-Week High/low Price Momentum Portfolios

This table presents the average equal-weighted monthly returns of portfolios that are created based on 52-week high/low price momentum strategy, involving all the stocks in the SET during the period from January 1988 to December 2007, by separate out the crisis period, which spanned over 1997-2000). At the beginning of each month stocks are sorted into three equally-weighted portfolios according to the ratio of the current price to its 52-week high (low). Stocks with the lowest ratio, furthest (nearest) from the 52-week high price (low) are assigned to the loser portfolio (R1). Stocks with the highest ratio, nearest (furthest) to the 52-week high price (low) are assigned to the winner portfolio (R3). (R3-R1) represents the 52-weekhigh/low price momentum strategy of winner –loser portfolio. *K* represents monthly evaluation periods (*K* = three, six, nine and 12 months). Monthly holding period returns are computed as an equal-weighted average of returns from strategies initiated at the beginning of this month and past months. The annual returns (*Year 1*, *Year 2*, *Year 3*, *Year 4*, and *Year 5*) are computed as event time returns for five 12-month periods. *Return* refers to the geometric average monthly return in percentages, and *Volume* represents the average daily turnover in percentages, both measured over the six-month portfolio formation period, *J* = 6. *Size* represents the time-series average of the median size on the six-month portfolio formation date. *Price* represents the time-series average of the median stock price of the portfolio in THB on the six-month portfolio formation date. The numbers in parentheses represent *t*-statistics.

Panel A: The Strategy of 52-Week High Price Momentum														
Portfolio	Return	Volume	Size	Price	Monthly Return				Annual Event Time Returns					
					K = 3	K = 6	K = 9	K = 12	Year 1	Year 2	Year 3	Year 4	Year 5	
52 week high ratio	R1	-1.41	2.3949	2,902.73	31.94	-1.38 (-5.41)	-1.41 (-3.19)	-0.26 (-2.27)	0.18 (-2.09)	-9.73 (-1.70)	-1.42 (-0.82)	-4.52 (-2.38)	2.71 (0.75)	14.34 (3.60)
	R2	2.25	3.4303	6,202.50	41.73	-0.44 (-1.94)	-0.67 (-0.18)	0.30 (0.20)	0.54 (0.17)	-13.84 (-0.64)	2.95 (1.18)	1.52 (0.79)	8.07 (3.31)	13.73 (4.54)
	R3	8.80	2.5639	7,921.88	62.29	0.77 (1.79)	0.52 (3.37)	1.50 (3.63)	1.28 (3.27)	8.87 (3.70)	7.17 (3.10)	4.94 (2.64)	9.89 (4.16)	11.43 (3.86)
	R3-R1					2.14 (5.17)	1.92 (4.65)	1.80 (4.21)	1.11 (3.81)	18.59 (3.85)	8.59 (2.73)	9.48 (3.56)	7.18 (2.15)	-2.92 (-1.18)
Panel B: The Strategy of 52-Week Low Price Momentum														
52 weeklow ratio	R1	-1.78	1.8347	2,538.67	25.46	0.96 (2.50)	1.23 (4.20)	1.29 (4.78)	1.44 (5.32)	-0.24 (-0.09)	-1.01 (-0.37)	5.78 (0.90)	6.07 (2.07)	12.69 (4.54)
	R2	2.06	2.7394	5,408.50	23.11	0.97 (3.51)	1.44 (4.74)	1.54 (4.46)	1.68 (4.93)	11.30 (1.85)	8.85 (0.83)	10.73 (4.36)	25.52 (10.78)	26.27 (10.42)
	R3	5.26	2.7935	7,088.26	20.84	1.03 (3.73)	1.72 (5.67)	1.92 (5.56)	1.90 (5.58)	15.65 (2.56)	27.47 (2.57)	1.72 (0.70)	7.77 (3.28)	12.71 (5.04)
	R3-R1					0.08 (0.17)	0.49 (1.17)	0.64 (1.50)	0.46 (1.08)	15.89 (1.21)	28.48 (1.43)	-4.06 (-0.63)	1.70 (0.60)	0.02 (0.13)

1.3 The dominance of the 52-week high price momentum over JT momentum strategies

According to Table I and II, the portfolio results exercised by 52-week high price momentum strategy outperforms the portfolios exercised by the JT momentum strategy for all formation and holding periods, statistically and economically.

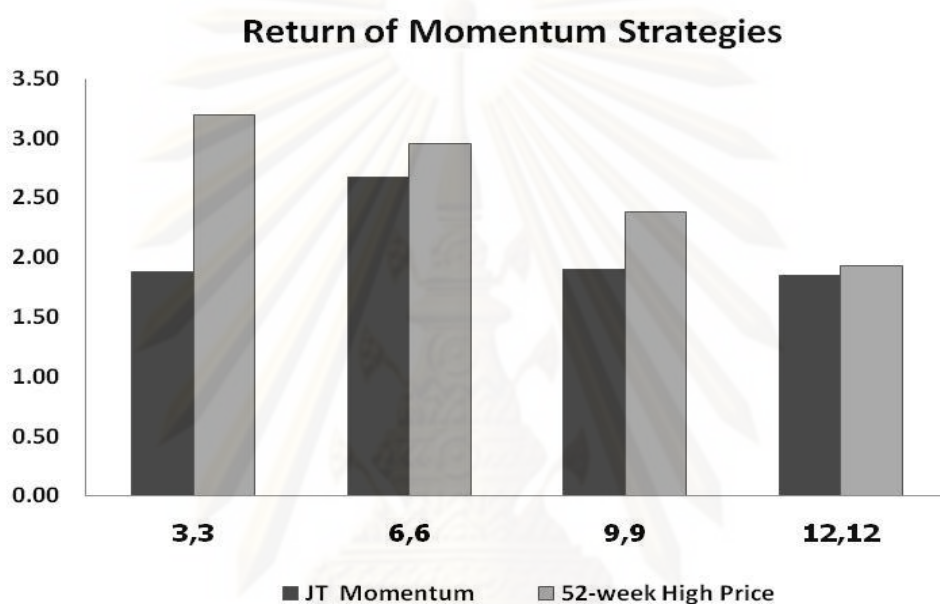


Figure 2: illustrates momentum profits for selected investment strategies. (J, K) denotes a formation period of J months and a holding period of K months. The return is measured as the self-financing (R3-R1) of holding period return based on Table I and II.

To provide more direct evidence on the comparison between both momentum strategies, the following table picks out the figures from Table I and II, reports the returns and t-statistic from self-financing portfolio of two momentum strategies. The top chart is the evidence of the six-month formation and six-month holding periods, (6, 6). The bottom chart exhibits the results the 12-month formation and 12-month holding periods, (12, 12).

The returns of the charts below illustrates that both momentum strategies earn significantly positive's return in both six and 12-month formation/holding period. For the comparison, the 52-week high price momentum strategy outperforms the JT momentum strategy in both periods with the statistically significant returns of 1.92 percent per month over 1.46 percent per month. The different of 52-week high and JT momentum returns is 0.46 percent per month in $(6, 6)$.

	Winner	Loser	Winner - Loser
<i>J = 6, K = 6</i>			
JT's individual stock returns momentum	1.43%	-0.68%	1.46% (2.44)
52-week high price momentum	0.52%	-1.41%	1.92% (4.65)
<i>J = 12, K = 12</i>			
JT's individual stock returns momentum	1.45%	0.62%	0.84% (2.18)
52-week high price momentum	1.28%	0.18%	1.11% (3.81)

To present more apparent outperforming of the 52-week high price momentum strategy over the JT momentum strategy, the differential of two momentum portfolio returns is created in Table III. The momentum returns of 52-week high strategy minus the returns of JT strategy, each in every holding period. All the figures verify that the 52-week high price momentum strategy significantly surpass the JT momentum strategy in all the cross-sectional formation and holding period.

In Figure3, illustrates the returns differential of JT momentum portfolios and the 52-week high price momentum portfolios based on Table III. All numbers are significantly positive, verify the outperforming portfolio returns of 52-week high over JT momentum strategies. In addition, the figures illustrate about the shorter of the holding period, the stronger dominance of 52-week strategy over JT strategy.

Table III
The Dominance on Returns of 52-Week High Price Momentum Portfolios over the JT's Individual Stock Returns Momentum Portfolios

This table presents the monthly portfolio returns differentiate in percentage, using the Table I and II. The number comes from the differences of returns from two momentum strategies; the returns from the 52-week high price momentum strategy and the returns from the stock returns momentum strategy. Every returns formed based on the formation period ($J =$ three, six, nine, and 12 months) are less by the return from the 52-week high price momentum strategy in the same holding for every periods.

J	Momentum Monthly Portfolios Return Differentiates			
	$K=3$	$K=6$	$K=9$	$K=12$
3	1.38 (4.47)	1.10 (5.20)	0.97 (6.15)	0.44 (3.49)
6	0.75 (3.36)	0.46 (4.89)	0.56 (4.24)	0.32 (4.24)
9	1.09 (6.07)	0.68 (6.18)	0.88 (7.07)	0.27 (6.74)
12	0.84 (7.17)	0.72 (7.78)	0.70 (5.89)	0.27 (7.25)

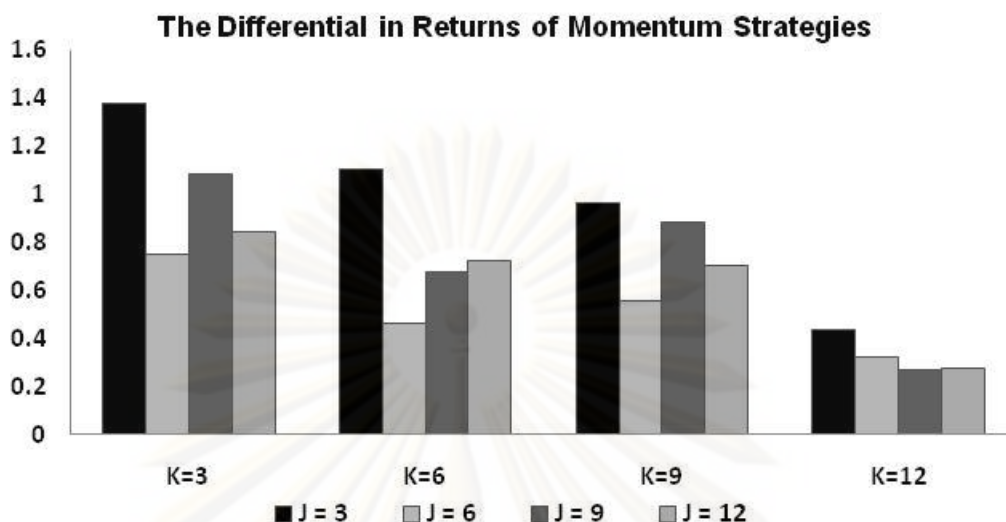


Figure 3: illustrates the returns differential of 52-week high momentum portfolio and the JT momentum portfolio based on the selected strategies. J is a formation period (3, 6, 9, and 12 months), K is a holding period (3, 6, 9, and 12 months).

In conclusion, Table I, II shows the result of the sample portfolios, separated out the crisis period (1997-2000), confirms the evidence of both momentum strategies (JT and 52-week high) in all formation and holding periods, which the 52-week high price momentum strategy significantly outperforms JT momentum strategy. For reversal term, it is consistent with the prior studies of Jegadeesh and Titman (1993) by finding significant long-term price reversals in Years 3, 4 and 5 of the JT momentum portfolio strategy. The evidence suggests that, the longer the assessment period for past returns, the stronger the future price reversals. Consistent with George and Hwang (2004), there is no evidence of the long-term reversal in 52-week high price momentum strategy. Also, there is no evidence that the strategy of 52-week low price momentum has the ability to predict the SET in both short-term momentum and long-term reversal.

However, there will be more discussions on this particular area later in the Subsection of the multiple regression tests (see Table VIII).

2. Volume-Based Momentum Strategies

To investigate volume-based momentum strategies, the portfolios are formed on the basis of a two-way independently sort between portfolio ranked from momentum strategies and past trading volume. Table values represent the average monthly return over the next K months ($K = 3, 6, 9, 12$).

2.1 Volume-based JT momentum strategy

Table IV provides the results from the interactions between past returns and past trading volume, which several keys are appeared in a great notice. First, conditional on past low returns portfolio (R1), all low volume (V1) stocks generally outperform high volume stocks (V3) over the next three, six, nine, and 12 months. This clearly is displayed in the consistently negative returns of the V3 - V1 portfolio. For example, with a six-month formation and six month holding period ($J = 6, K = 6$), low volume losers significantly outperform high volume losers by 0.73 percent per month.

Second, in contradict to the studies of Lee and Swaminathan (2000), on past high returns portfolio (R3), all high volume (V3) generally gain more future returns than low volume stocks (V1) over all the holding periods. This evidently is displayed in the constantly positive returns of the V3 - V1 portfolio. For example, with ($J = 6, K = 6$), high volume winners significantly outperform low volume winners by 1.51 percent per month. The similar results are found in every (J, K) combinations. Apparently, loser stocks that experience low trading volume in the recent past tends to outperform loser stock that experience high trading volume. In contrast, winner stocks that experience high trading volume in the recent past tend to outperform winner stocks that experience low trading volume.

Third, the bottom row of each cell in this table shows the return to a self-financing momentum strategy (R3 - R1). Focusing on this row, it is clear that R3 - R1 returns are higher for high volume (V3) firms than for low volume (V1) firms. For example, in $J = 6$ and $K = 6$, the momentum spread is 2.68 percent per month for high volume firms and only 0.45 percent for low volume firms with both statistically significant t-statistic of 4.26 and 1.44, respectively. Therefore, the self-financing difference between high volume and low volume is 2.23 percent per month, which every combination cells of (J, K) illustrate qualitatively the same effect. Conceptually, over the next 12 months, price momentum is more pronounced among high volume stocks than low volume stocks.

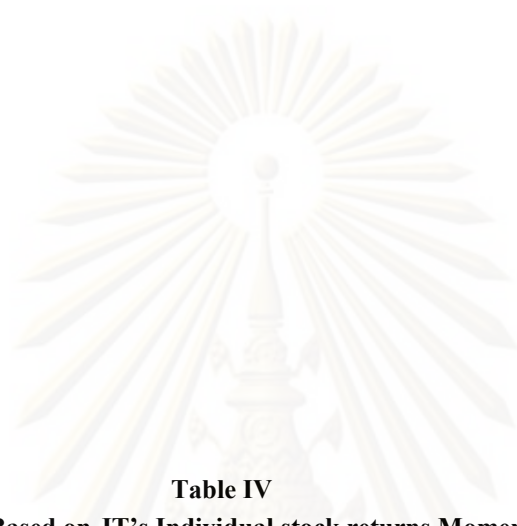


Table IV

Monthly Returns for Portfolios Based on JT's Individual stock returns Momentum and Trading Volume

This table presents average monthly returns, in percentage, from portfolio strategies used an independent two-way based on past returns and past average daily turnover for the 1988 to 2007 time period, by separated out the crisis period, which spanned over 1997-2000). At the beginning of each month all available stocks in the SET are sorted independently based on past j month returns and divided into 3 portfolios. K represents monthly holding periods where $K =$ three, six, nine, or 12 months. $R1$ represents the *loser* portfolio, and $R3$ represents the *winner* portfolio. The stocks are then independently sorted based on the average daily volume over the past *six* months and divided into three portfolios, where I use turnover as a proxy of trading volume. $V1$ represents the lowest trading volume portfolio, and $V3$ represents the highest trading volume portfolio. The stocks at the intersection of the two sorts are grouped together to form portfolios based on past returns and past trading volume. Monthly holding period returns are computed as an equal-weighted average of returns from strategies initiated at the beginning of this month and past months. The numbers in parentheses are simple t -statistics.

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J	Portfolio	K=3				K=6				K=9				K=12			
		V1	V2	V3	V3-V1	V1	V2	V3	V3-V1	V1	V2	V3	V3-V1	V1	V2	V3	V3-V1
3	R1	0.34 (1.14)	0.12 (0.39)	-0.34 (-0.99)	-0.67 (-3.46)	0.34 (1.38)	0.27 (0.92)	0.19 (0.55)	-0.14 (-0.68)	0.10 (0.45)	0.13 (0.51)	0.01 (0.03)	-0.09 (-0.56)	0.03 (0.16)	-0.12 (-0.52)	-0.22 (-0.80)	-0.25 (-1.76)
	R2	0.46 (1.68)	0.75 (2.41)	1.00 (2.72)	0.55 (2.66)	0.76 (3.16)	1.12 (3.79)	1.22 (2.96)	0.47 (1.78)	0.53 (2.18)	0.77 (2.70)	0.98 (2.71)	0.45 (2.00)	0.34 (1.68)	0.64 (2.88)	0.67 (2.17)	0.32 (1.52)
	R3	0.66 (2.41)	1.02 (3.28)	1.55 (4.19)	0.89 (4.33)	0.93 (3.90)	1.49 (5.03)	2.27 (5.50)	1.34 (5.12)	0.69 (2.87)	1.10 (3.85)	1.79 (4.96)	1.10 (4.86)	0.20 (2.82)	0.72 (3.24)	1.52 (4.95)	1.30 (4.46)
	R3-R1	0.32 (0.80)	0.89 (2.03)	1.88 (3.78)	1.56 (5.55)	0.59 (1.74)	1.22 (2.91)	2.08 (3.88)	1.48 (4.53)	0.48 (1.85)	0.96 (2.49)	1.79 (3.96)	1.19 (4.55)	0.10 (1.87)	0.84 (2.64)	1.74 (4.30)	1.60 (5.04)
6	R1	-0.43 (-1.98)	-0.67 (-2.83)	-1.03 (-3.35)	-0.60 (-3.14)	-0.41 (-0.68)	-0.50 (-0.81)	-1.14 (-1.96)	-0.73 (-2.48)	-0.18 (0.59)	-0.42 (-0.13)	-0.70 (-1.00)	-0.52 (-2.42)	0.00 (0.86)	-0.31 (-0.12)	-0.48 (-0.79)	-0.48 (-2.73)
	R2	0.28 (0.51)	0.11 (-0.17)	0.31 (0.43)	0.03 (0.12)	-0.01 (0.68)	-0.20 (0.33)	0.20 (0.84)	0.21 (0.70)	0.14 (1.48)	0.10 (1.28)	0.56 (2.27)	0.42 (2.17)	0.31 (1.56)	0.15 (1.34)	0.58 (2.51)	0.27 (2.58)
	R3	0.36 (0.69)	0.57 (1.20)	1.10 (2.34)	0.73 (3.02)	0.03 (1.29)	0.76 (2.84)	1.54 (3.56)	1.51 (4.54)	0.16 (1.95)	0.80 (3.20)	1.47 (4.78)	1.31 (5.53)	0.01 (1.97)	0.50 (2.55)	1.28 (4.33)	1.22 (5.14)
	R3-R1	0.79 (1.87)	1.24 (2.82)	2.13 (4.02)	1.33 (4.39)	0.45 (1.44)	1.26 (2.78)	2.68 (4.26)	2.23 (5.49)	0.34 (0.96)	1.22 (2.53)	2.17 (4.54)	1.82 (6.32)	0.01 (0.69)	0.78 (2.07)	1.57 (4.07)	1.30 (6.20)
9	R1	-0.19 (-0.59)	-0.62 (-1.78)	-1.09 (-2.42)	-0.89 (-3.60)	0.30 (1.00)	-0.11 (-0.29)	-0.43 (-1.01)	-0.74 (-2.71)	0.52 (1.99)	0.23 (0.74)	0.05 (0.16)	-0.47 (-2.35)	0.74 (2.86)	0.48 (1.64)	0.31 (0.97)	-0.43 (-2.56)
	R2	0.28 (0.73)	0.03 (0.08)	0.22 (0.44)	-0.07 (-0.24)	0.54 (1.66)	0.43 (1.00)	0.78 (1.54)	0.24 (0.75)	0.44 (1.82)	0.55 (1.65)	1.02 (2.63)	0.58 (2.55)	0.56 (2.38)	0.79 (2.33)	1.42 (3.43)	0.85 (3.52)
	R3	0.73 (1.86)	0.94 (2.30)	1.66 (3.32)	0.93 (3.32)	0.71 (2.17)	1.37 (3.21)	2.23 (4.41)	1.52 (4.81)	0.75 (3.05)	1.18 (3.57)	1.95 (5.02)	1.20 (5.32)	0.88 (3.73)	1.26 (3.72)	2.08 (5.03)	1.20 (4.93)
	R3-R1	0.92 (1.85)	1.56 (2.95)	2.74 (4.12)	1.82 (4.93)	0.40 (0.91)	1.48 (2.62)	2.66 (4.09)	2.26 (5.50)	0.23 (0.63)	0.96 (2.14)	1.90 (3.81)	1.67 (5.61)	0.14 (0.42)	0.78 (1.79)	1.77 (3.54)	1.63 (5.88)
12	R1	-0.18 (-0.82)	-0.68 (-2.44)	-1.11 (-3.08)	-0.93 (-5.72)	0.60 (1.70)	0.40 (0.90)	-0.33 (-0.77)	-0.93 (-3.73)	0.40 (1.63)	0.45 (1.39)	0.15 (0.44)	-0.25 (-1.31)	0.46 (2.02)	0.52 (1.68)	0.31 (0.95)	-0.15 (-0.88)
	R2	0.32 (1.63)	-0.03 (-0.11)	0.14 (0.32)	-0.19 (-0.91)	0.70 (2.11)	0.61 (1.31)	0.96 (1.84)	0.26 (0.89)	0.50 (2.01)	0.49 (1.39)	1.11 (2.60)	0.61 (2.43)	0.50 (1.79)	0.65 (1.80)	1.53 (3.49)	1.03 (4.59)
	R3	0.34 (1.73)	0.81 (2.75)	1.46 (3.44)	1.12 (5.38)	1.03 (3.10)	1.60 (3.43)	2.39 (4.58)	1.36 (4.63)	0.83 (3.35)	1.09 (3.10)	2.05 (4.82)	1.22 (4.87)	0.70 (3.35)	1.08 (2.97)	2.15 (4.92)	1.50 (5.43)
	R3-R1	0.53 (-1.70)	1.48 (0.15)	2.57 (4.69)	2.05 (2.00)	0.43 (0.88)	1.20 (1.87)	2.72 (4.15)	2.29 (6.05)	0.43 (1.23)	0.64 (1.34)	1.91 (3.62)	1.48 (4.82)	0.20 (1.37)	0.56 (1.19)	1.85 (3.56)	1.70 (4.96)

2.2 Volume-based 52-week high price momentum strategy

Table V provides the results from the interactions between 52 week high price momentum portfolio strategy ranked and past trading volume, which produce similar details as the prior studies. First, low volume loser stocks (V1R1) generally outperform high volume loser stocks (V3R1) over the next three, six, nine, and 12 months. This clearly is displayed in the consistently negative returns of the V3 - V1 portfolio (V3R1 - V1R1). For example, with six month holding period ($K = 6$), in R1 portfolio, low volume losers significantly outperform high volume losers by 1.04 percent per month.

Second, high volume winner stocks (V3R3) generally gain more returns than low volume winner stocks (V1R3) over all the holding periods. This evidently is displayed in the constantly positive returns of the V3 - V1 portfolio (V3R3 - V1R3). For example, with $K = 6$, high volume winners significantly outperform low volume winners by 0.69 percent per month. The similar results are found in every holding period of the portfolio strategies. The evidence is consistent with the results from Volume-based JT momentum strategy.

Third, focus on the self-financing momentum strategy ($R3 - R1$), it is clear that $R3 - R1$ returns are higher for high volume (V3) firms than for low volume (V1) firms. For example, $K = 6$, the momentum spread is 2.96 percent per month for high volume firms and only 1.20 percent for low volume firms with both statistically significant t-statistic of 5.34 and 2.87, respectively. Therefore, the self-financing difference between high volume and low volume is 1.71 percent per month, which every combination cells of (J, K) illustrate the same positive returns. Similarly with volume-based JT momentum strategy, over the next 12 months, 52-week high price momentum is also more pronounced among high volume stocks than low volume stocks.

With the counterintuitive result, also consistent with volume-based JT momentum strategy, buying high volume winners and selling low volume winners or buying low volume loser and selling high volume loser does not enhance the performance of the 52-week high price momentum strategy.

Table V

Monthly Returns for Portfolios Based on 52-Week High Price Momentum and Trading Volume

This table presents average monthly returns, in percentage, from portfolio strategies based on an independent two-way based on the 52-week high price nearness ratio's past return and past average daily turnover for the 1988 to 2007 time period, by separated out the crisis period, which spanned over 1997-2000). At the beginning of each month all available stocks in the SET are sorted independently based on 52-week high price momentum strategy and divided into 3 portfolios. K represents monthly holding periods where $K =$ three, six, nine, or 12 months. $R1$ represents the *loser* portfolio, and $R3$ represents the *winner* portfolio. The stocks are then independently sorted based on the average daily volume over the past *six* months and divided into three portfolios, where I use turnover as a proxy of trading volume. $V1$ represents the lowest trading volume portfolio, and $V3$ represents the highest trading volume portfolio. The stocks at the intersection of the two sorts are grouped together to form portfolios of past returns and past trading volume. Monthly holding period returns are computed as an equal-weighted average of returns from strategies initiated at the beginning of this month and past months. The numbers in parentheses are simple t -statistics.

Portfolio	K=3				K=6				K=9				K=12				
	V1	V2	V3	V3-V1	V1	V2	V3	V3-V1	V1	V2	V3	V3-V1	V1	V2	V3	V3-V1	
52 week high ratio	R1	-0.87 (-1.21)	-1.30 (-3.66)	-1.95 (-5.18)	-1.08 (-6.17)	-0.88 (0.69)	-1.41 (-1.23)	-1.92 (-2.89)	-1.04 (-5.67)	0.02 (1.53)	-0.30 (-1.18)	-0.49 (-1.71)	-0.52 (-5.19)	0.42 (1.28)	0.13 (0.07)	-0.01 (-0.35)	-0.43 (-2.63)
	R2	-0.35 (-1.14)	-0.55 (-1.59)	-0.41 (-1.10)	-0.05 (-0.40)	-0.51 (0.13)	-0.67 (0.57)	-0.58 (0.69)	-0.06 (0.99)	0.11 (0.80)	0.37 (1.18)	0.43 (1.12)	0.32 (1.11)	0.37 (1.48)	0.57 (1.70)	0.68 (1.63)	0.31 (1.34)
	R3	0.38 (1.26)	0.67 (2.18)	1.25 (2.82)	0.85 (3.09)	0.32 (2.01)	0.52 (3.55)	1.03 (4.51)	0.69 (5.24)	0.55 (2.51)	1.03 (4.02)	1.88 (4.98)	1.36 (6.08)	0.77 (2.77)	1.16 (3.90)	1.92 (4.74)	1.15 (5.01)
	R3-R1	1.25 (3.26)	1.96 (4.19)	3.20 (5.69)	1.95 (6.77)	1.20 (2.87)	1.92 (3.26)	2.96 (5.34)	1.71 (7.75)	0.56 (2.59)	1.33 (3.71)	2.38 (4.95)	1.86 (8.06)	0.37 (2.09)	1.04 (2.63)	1.93 (4.55)	1.56 (6.05)

2.3 The dominance of volume-based 52-week high price over volume-based JT momentum strategies.

According to Table IV and V, the comparison between two momentum strategies with each combined the trading volume, the portfolio results exercised by volume-based 52-week high price momentum strategy significantly outperforms the portfolio's exercised by the volume-based JT momentum strategy for every categories of trading volume.

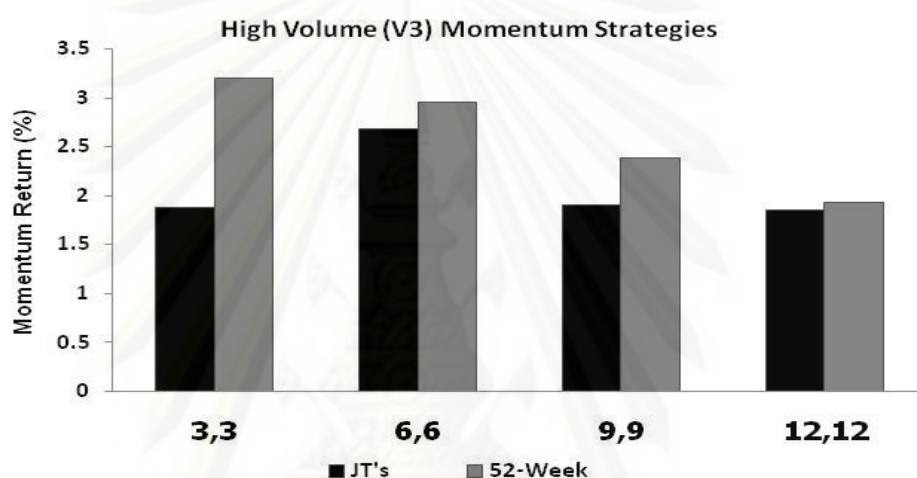


Figure 4: illustrates the percentage in returns to momentum in high volume stocks (V3) based on two momentum strategies; JT's and 52-week high, using selected (J, K) strategies.

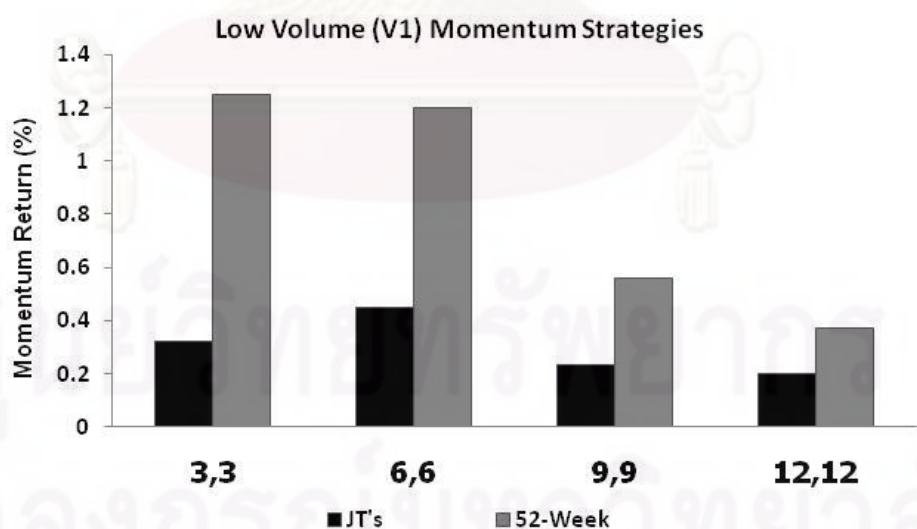


Figure 5: illustrates the percentage in returns to momentum in low volume stocks (V1) based on two momentum strategies; JT's and 52-week high, using selected (J, K) strategies.

Figure 5 and 6 above, present the outperforming of 52-week high strategy over the JT momentum strategy in high and low volume stock conditions, especially

noticeable in low volume portfolios. From the Figures, it suggests that the shorter of the holding period, the stronger the volume-based 52-week high can perform the momentum profitability over the JT momentum strategy.

To provide more direct evidence on the comparison between both volume-based momentum strategies, the following table briefs out the figures from Table IV and V, reports the returns and t-statistic from self-financing portfolio of six-month formation period and six-month holding period, (6,6). The top chart presents the results of high volume stocks and the bottom chart exhibits the results from of the low volume stocks.

	Winner	Loser	Winner - Loser
High Volume (V3)			
JT's individual stock returns momentum	1.54%	-1.14%	2.68% (4.26)
52-week high price momentum	1.03%	-1.92%	2.96% (5.34)
Low Volume (V1)			
JT's individual stock returns momentum	0.03%	-0.41%	0.45% (1.44)
GH' 52-week high price momentum	0.32%	-0.88%	1.20% (2.87)

According to the chart above, in high volume portfolios, both the JT and 52-week high strategies earn significant returns, whereas, in low volume portfolio, only 52-week high price momentum portfolio earns significant returns. The charts above also illustrates that, in both high and low volume stocks classified, the 52-week high price momentum strategy outperforms the JT momentum strategy with the statistically significant returns of 2.96 percent per month over 2.68 percent per month in the high volume portfolios with higher predictive power and 1.20 percent per month over insignificant 0.45 percent per month in the low volume portfolios.

To indicate the absolute outperforming of the volume-based 52-week high price momentum strategy over the volume-based individual stock returns momentum strategy, the differential of momentum returns is created in Table VI. The figures in the table reports momentum returns of volume-based 52-week high strategy minus the returns of volume-based JT strategy, in each of every holding period. All the positive figures verify that the volume-based 52-week high price momentum strategy

significantly surpass the volume-based JT momentum strategy in all the combinations of formation and holding period, in every categories of trading volume stocks.

In Figure 6, illustrates the returns differential of volume-based JT momentum portfolios and the volume-based 52-week high price momentum portfolios based on Table VI. All numbers are significantly positive, verify the outperforming portfolio returns of 52-week high over JT momentum strategies in all volume stocks classifications, similar in all holding periods. The figures present the difference of returns provide information that the shorter of the holding period, the stronger dominance of volume-based 52-week high strategy over volume-based JT strategy.

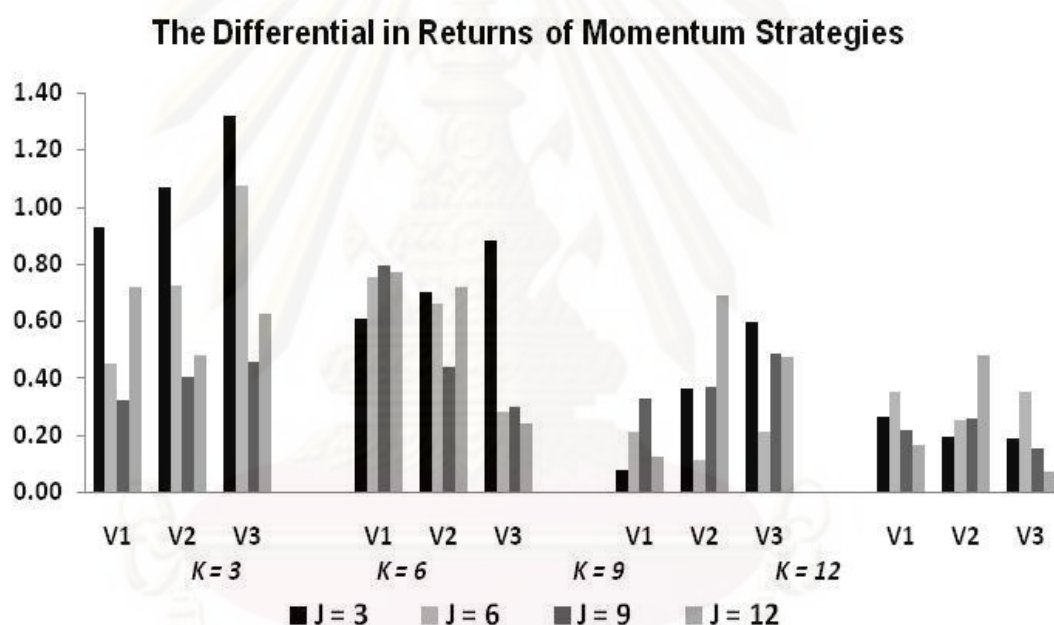


Figure 6: illustrates the returns differentiate of volume-based 52-week high momentum portfolio and the volume-based JT momentum portfolio based on the selected strategies; J is a formation six-month period and K is a holding period (3, 6, 9, and 12 months).

Table VI

The Dominance on Portfolio Returns of the Volume-Based 52-Week High Price over the Volume-Based JT's Stock Returns Momentum Strategies

This table presents the monthly portfolio returns differentiate in percentage, using the Table IV and V. The number comes from the differences of returns from two momentum strategies; the returns from the volume-based 52-week high price momentum strategy and the returns from the volume-based JT momentum strategy. Every returns forming based on the formation period ($J =$ three, six, nine, and 12 months) is less by the return from the 52-week high price momentum strategy in the same month-holding for every periods and every trading volume portfolios.

Momentum Monthly Portfolio Returns Differentiates												
J	$K=3$			$K=6$			$K=9$			$K=12$		
	V1	V2	V3	V1	V2	V3	V1	V2	V3	V1	V2	V3
3	0.93 (3.93)	1.07 (5.67)	1.32 (4.29)	0.61 (5.31)	0.70 (6.20)	0.88 (5.83)	0.08 (5.00)	0.37 (6.95)	0.60 (5.42)	0.27 (5.40)	0.20 (3.76)	0.19 (4.40)
6	0.45 (3.61)	0.73 (3.40)	1.07 (4.38)	0.76 (4.71)	0.66 (5.07)	0.28 (5.42)	0.21 (5.20)	0.11 (4.32)	0.21 (4.80)	0.36 (4.86)	0.26 (3.56)	0.35 (4.90)
9	0.33 (5.05)	0.41 (5.91)	0.46 (6.97)	0.80 (6.01)	0.44 (6.95)	0.30 (6.37)	0.33 (5.86)	0.37 (7.25)	0.49 (5.64)	0.22 (5.59)	0.26 (5.80)	0.16 (6.19)
12	0.72 (5.03)	0.48 (4.26)	0.63 (5.05)	0.78 (6.52)	0.72 (6.81)	0.25 (6.53)	0.13 (6.74)	0.69 (8.20)	0.48 (5.69)	0.17 (4.75)	0.48 (6.36)	0.08 (6.57)

To provide more examinations in the different angels, the Figure 7 below presents the comparison of returns to momentum strategies, based on trading volume and the portfolios ranked; low volume losers, low volume winners, high volume losers, and high volume winners' portfolio.

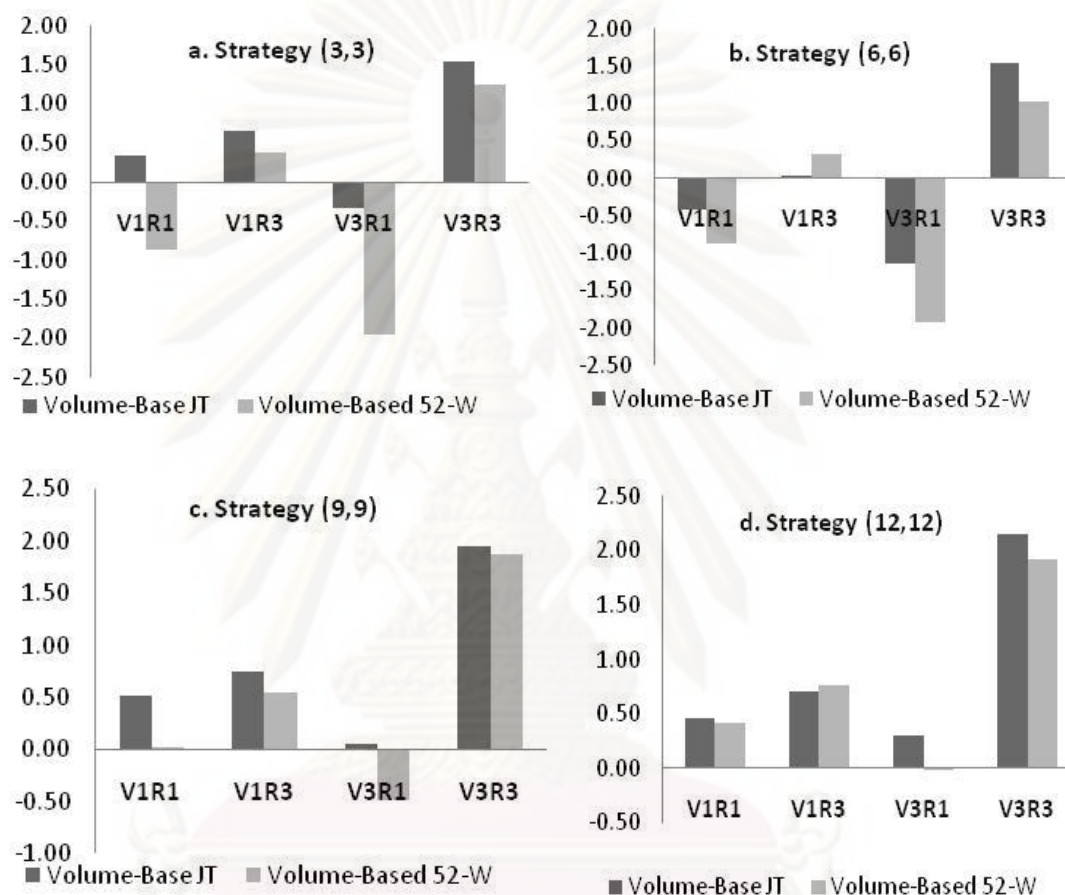


Figure 7: V1R1 is the portfolio of low-volume losers; V1R3 is the portfolio of low-volume winners, V3R1 is the portfolio of high-volume losers, V3R3 is the portfolio of high-volume winners. (J, K) denotes a formation period of J months and a holding period of K months, where $J, K = 3, 6, 9, \text{ and } 12$.

According to the Figure 7 above, all four figures represent the comparison of two momentum strategies; the volume-based JT momentum and the volume-based 52-week high price momentum, in the selected formation and holding periods. As originally stated in Lee and Swaminathan (2000), "Controlling for price momentum, low volume stocks generally outperform high volume stocks", similarly as figures show in loser portfolios, the low volume outperform the high volume stocks, contradictory in winner portfolios, the high volume stocks outperform the low volume stocks in all combinations of the formation/holding periods, experienced in both two momentum strategies.

To have close examinations, both two momentum strategies experience quite similar patterns, however, the returns in loser portfolios 52-week high strategy experience more loss in high and low volume stocks than found in JT's.

As suggestion from Lee and Swaminathan (2000) studies, it is most profitable to buy low-volume winners and sell high-volume losers, which is different from my findings. Obviously shown in the Figure 7, found in both momentum strategies, the highest bar among others is the high volume winner (V3R3), produces highest future returns, and the lowest bar among others is the high volume loser (V3R1), produces lowest future returns. To enhance the momentum profit is to buy past high-volume winners and sell past high-volume losers.

Plus, the evidence presented in Table VI and in Figure 4, 5, and 6, show that the portfolios formed by volume-based 52-week high strategy significantly outperform the portfolios formed by JT momentum strategy. Together with the above evidences, the most profitable momentum strategy in the Stock Exchange of Thailand (SET) is to form portfolio based on 52-week high price momentum strategy in high volume stocks, which is buying past high volume winner stocks, ranked by 52-week high momentum strategy, and selling past high volume loser stocks, ranked by 52-week high momentum strategy.

ž From the evidence, it objects the theory of Momentum Life Cycle (MLC), proposed by Lee and Swaminathan (2000), there is no evidence that the trading volume can explain the reversal aspect in the Stock exchange of Thailand (SET). From the empirical results, traders who use information contained in the volume statistic would outperform the traders who do not. Since, trading volume contains the information help the investors distinguish between the stocks that possibly give the strong profit for the portfolios and those that are not. Basically, most investor chooses to trade the stocks that experienced past high volume, when they witness the past poor performance, they tend to sell that loser stocks in the next periods. So the past loser stocks continue to be losers in the near future. Conversely, with the high volume stock traders, when they witness the stocks that have past strong performance, they tend to buy that winner stocks in the next periods. So the past winner stocks continue to be winners in the near future. However, the particular effect is stronger in the strategy of 52-week high price momentum.

3. Robustness Tests

Table VII presents various robustness checks on these basic of intermediate and long-term horizon results of four momentum strategies, which are the JT momentum strategy in Panel A, the 52-week high price momentum strategy in Panel B, the volume-based JT momentum strategy in Panel C, and the volume-based 52-week high price momentum strategy in Panel D. The Tables reports the momentum returns for three sub-periods. The first sub-period, a pre-crisis period spans over 1988 to 1996, the second sub-period, a crisis period, covers 1997 to 2000, and for the last sub-period, a post-crisis, covers 2001 to 2007. Consistent with other formation periods, the momentum strategy results are reported in only for the six-month formation period ($J = 6$).

In all three sub-periods, particularly confirm the important aspects discovered in the previous studies on momentum strategies and also present the volatile of the crisis period outcome, which is capable of redirecting and shadowing the appearances of the momentum results based on the sample portfolios. The evidences from the robustness test verify that return in winners generally outperform the return in losers, low volume loser outperform high volume loser, high volume winner outperform low volume winner, and momentum is stronger among high volume stocks.

To ensure that these results are not driven by a few small stocks, Panel E reports returns of two volume-based momentum strategies formed by the largest 50 percent of all SET stocks. As predictable, both the momentum and volume effects are weaker for this restricted sample with the continuation to obtain the momentum results. The strategic of volume-based 52-week high, in spite of the particular constrain, significantly dominate the strategic of volume-based JT momentum in every holding period. For example, at $K = 6$, the results of 52-week high momentum outperform the JT momentum spread with 2.67 percent per month over 2.44 percent per month in high volume stocks, respectively, with the significant t-statistic of 5.16 over 4.21, with 0.65 percent per month over 0.26 percent per month, respectively, with the significant t-statistic of 2.54 over un-significant 1.31 in low volume stocks.

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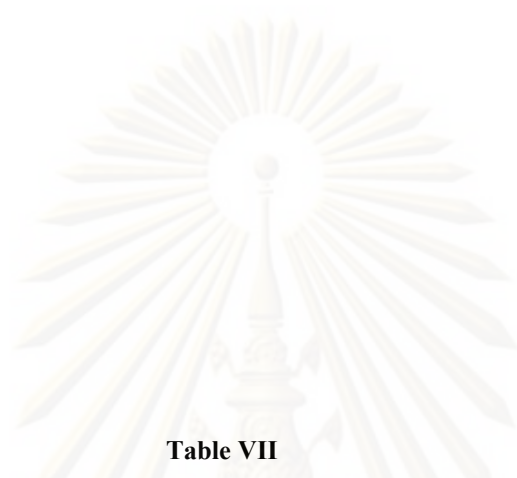


Table VII

Returns on Portfolios Based on Four Momentum Strategies: Robustness Tests

This table presents subsample period results and the results using only the largest 50% of SET stocks in all four momentum strategies. I present all these results only for the six-month portfolio formation period ($J = 6$). Both subsample period and 50% largest strategies, are formed using three momentum portfolios. K represents monthly holding periods where $K =$ three, six, nine or 12 months. $R1$ represents the *loser* portfolio. $R3$ represents the *winner* portfolio when I form three price momentum portfolios. The annual returns (*Year 1, Year 2, Year 3, Year 4, and Year 5*) are computed as event time returns for five 12-month periods, are provided in the tables. *Return* refers to the geometric average monthly return in percentages, and *Volume* represents the average daily turnover in percentages, both measured over the six-month portfolio formation period, $J = 6$. *Size* represents the time-series average of the median size on the six-month portfolio formation date. *Price* represents the time-series average of the median stock price of the portfolio in THB on the six-month portfolio formation date. For volume-Based portfolios, the stocks are then independently sorted based on the average daily volume over the past *six* months and divided into three portfolios, where I use turnover as a proxy of trading volume. $V1$ represents the lowest trading volume portfolio. $V3$ represents the highest trading volume portfolio when I form three volume portfolios. Monthly holding period returns are computed as an equal-weighted average of returns from strategies initiated at the beginning of this month and past months. The numbers in parentheses are simple t -statistics.

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Panel A: Subsample Results, Returns on Portfolios Based on JT's Stock Returns Momentum Strategy

Portfolio	Return	Volume	Size	Price	Monthly Return				Annual Event Time Returns					
					K = 3	K = 6	K = 9	K = 12	Year 1	Year 2	Year 3	Year 4	Year 5	
Sample Period: 1988-1996														
R1	-3.54	1.23	3,662.14	54.90	-1.02 (-0.26)	-1.31 (-0.19)	-0.85 (-0.22)	-0.53 (-1.20)	-9.30 (-1.75)	2.48 (-0.92)	-3.98 (-1.41)	5.16 (1.46)	10.40 (2.67)	
R2	-0.26	1.17	5,667.66	60.51	-0.15 (-1.16)	-0.62 (-1.20)	-0.13 (-0.97)	-0.04 (-0.11)	-3.10 (-0.50)	-1.35 (-0.56)	-4.65 (-1.77)	38.60 (0.99)	10.70 (2.60)	
R3	4.73	1.63	6,210.67	117.61	0.32 (2.21)	1.32 (2.55)	1.03 (2.75)	0.06 (2.68)	3.80 (0.61)	-5.04 (-2.09)	-7.20 (-2.76)	2.50 (0.64)	7.03 (1.71)	
R3-R1					1.34 (1.90)	1.32 (2.00)	1.03 (2.26)	0.59 (2.04)	13.10 (2.63)	-2.56 (-0.72)	-3.15 (-1.92)	-2.70 (-1.75)	-3.40 (-0.85)	
Sample Period: 1997-2000 (Crisis Period)														
R1	-4.02	1.37	3,825.15	47.99	3.42 (0.10)	3.77 (0.57)	3.50 (0.42)	3.61 (0.52)	38.28 (0.00)	1.51 (0.10)	37.30 (0.09)	1.09 (0.54)	2.79 (0.59)	
R2	0.30	0.95	5,267.89	52.61	1.72 (0.21)	3.42 (0.32)	3.47 (0.98)	3.72 (0.01)	7.96 (1.54)	4.85 (1.83)	10.64 (1.81)	-25.29 (1.75)	-20.83 (0.16)	
R3	8.94	1.64	6,414.76	51.07	0.47 (1.42)	0.11 (0.83)	0.23 (1.01)	1.19 (1.73)	1.25 (0.71)	3.57 (1.67)	14.46 (0.20)	-6.07 (0.73)	-11.00 (1.87)	
R3-R1					-2.94 (-1.99)	-2.35 (-2.44)	-2.42 (-3.63)	-2.27 (-2.50)	-37.02 (-1.03)	-2.69 (-2.61)	-22.91 (-2.89)	-7.07 (-2.84)	-13.83 (-0.03)	
Sample Period: 2001-2007														
R1	-4.01	1.41	4322.52	13.40	-0.40 (-0.43)	-0.05 (-4.00)	-0.01 (-2.58)	0.00 (-2.90)	10.65 (3.00)	27.72 (7.59)	23.60 (4.31)	40.06 (7.62)	36.40 (6.89)	
R2	-0.24	1.91	5694.25	52.75	0.62 (3.50)	0.61 (7.20)	0.66 (3.23)	0.73 (2.92)	48.60 (12.51)	44.60 (9.47)	31.10 (9.87)	31.40 (8.23)	47.10 (7.25)	
R3	6.60	2.07	7537.91	29.86	1.03 (2.61)	1.55 (6.37)	1.44 (2.60)	1.13 (2.83)	25.99 (6.69)	24.70 (5.24)	13.55 (4.31)	29.20 (7.64)	25.90 (3.99)	
R3-R1					1.43 (1.95)	1.60 (2.27)	1.45 (2.36)	0.99 (2.30)	15.33 (2.94)	-3.24 (-0.93)	-10.04 (-2.18)	-10.90 (-1.97)	-10.44 (-1.28)	

Panel B: Subsample Results, Returns on Portfolios Based on 52-Week High Price Momentum Strategy

Portfolio	Return	Volume	Size	Price	Monthly Return				Annual Event Time Returns				
					K = 3	K = 6	K = 9	K = 12	Year 1	Year 2	Year 3	Year 4	Year 5
Sample Period: 1988-1996													
R1	-1.83	1.66	2,854.05	53.90	-1.62 (-2.89)	-1.79 (-1.70)	-0.31 (-1.82)	-0.63 (-1.92)	-7.50 (-1.95)	-7.30 (-2.34)	-10.40 (-3.67)	0.10 (0.02)	6.59 (1.67)
R2	0.95	1.53	5,366.73	55.50	-0.66 (-0.80)	-1.26 (-0.22)	0.00 (0.59)	-0.30 (-0.80)	-33.90 (-0.83)	-2.56 (-0.79)	-2.90 (-0.92)	5.73 (1.60)	6.30 (1.90)
R3	3.33	2.77	6,740.54	81.74	0.61 (1.38)	0.26 (1.84)	0.94 (1.44)	0.39 (1.10)	4.74 (1.16)	0.02 (0.01)	1.90 (0.60)	7.95 (2.22)	6.05 (1.82)
R3-R1					2.23 (4.98)	2.05 (3.97)	1.26 (3.89)	1.02 (3.35)	12.24 (2.20)	7.32 (1.65)	12.30 (2.93)	7.85 (1.46)	-0.54 (-0.11)
Sample Period: 1997-2000 (Crisis Period)													
R1	-3.45	2.07	2,363.29	12.27	4.48 (0.78)	5.22 (0.56)	3.03 (0.61)	2.47 (1.14)	55.60 (1.39)	33.74 (1.58)	37.69 (0.10)	18.18 (1.02)	-3.19 (-0.07)
R2	0.75	1.04	4,798.21	15.38	2.48 (0.01)	3.65 (0.06)	1.75 (0.06)	1.32 (0.02)	58.70 (0.00)	16.09 (0.00)	23.09 (0.48)	12.30 (1.36)	-3.17 (-0.09)
R3	4.20	0.62	4,875.18	26.84	0.45 (0.16)	1.72 (0.85)	-0.26 (0.31)	0.00 (0.16)	15.01 (1.18)	6.74 (0.31)	12.30 (0.01)	4.29 (0.05)	-2.21 (-0.06)
R3-R1					-4.02 (-2.08)	-3.50 (-3.09)	-3.38 (-3.00)	-2.50 (-2.00)	-40.59 (-0.44)	-27.00 (-0.63)	-25.38 (-1.19)	-13.89 (-0.01)	0.98 (0.03)
Sample Period: 2001-2007													
R1	-2.03	2.10	2,930.66	9.03	-1.14 (-5.05)	-1.02 (-3.68)	-0.20 (-1.31)	1.00 (1.08)	-11.95 (-0.45)	4.47 (1.34)	1.36 (0.63)	5.31 (2.16)	22.09 (4.96)
R2	1.04	1.10	7,197.38	19.66	-0.21 (-2.35)	-0.09 (-0.48)	0.61 (2.04)	1.38 (2.07)	6.22 (2.61)	8.46 (3.49)	5.94 (3.44)	10.41 (5.62)	21.15 (7.92)
R3	3.46	3.05	9,629.38	41.96	0.93 (1.20)	0.77 (3.53)	1.36 (5.91)	2.17 (5.52)	12.99 (5.45)	14.31 (5.90)	7.98 (4.63)	11.82 (6.38)	16.80 (6.30)
R3-R1					2.04 (4.90)	1.79 (4.30)	1.59 (3.61)	1.20 (3.59)	24.94 (4.03)	9.84 (2.52)	6.62 (2.47)	6.51 (2.21)	-5.29 (-1.13)

Panel C: Subsample Results, Returns on Portfolios Based on JT's Stock Returns Momentum and Trading Volume

Portfolio	K=3				K=6				K=9				K=12			
	V1	V2	V3	V3-V1	V1	V2	V3	V3-V1	V1	V2	V3	V3-V1	V1	V2	V3	V3-V1
Sample Period: 1988-1996																
R1	-0.67 (-1.43)	-0.99 (-1.97)	-1.41 (-2.56)	-0.74 (-2.60)	-0.84 (-1.59)	-0.97 (-1.78)	-2.12 (-3.62)	-1.28 (-3.96)	-0.44 (-1.07)	-0.84 (-1.85)	-1.27 (-2.75)	-0.84 (-4.00)	-0.20 (-0.58)	-0.63 (-1.81)	-0.77 (-2.23)	-0.57 (-3.81)
R2	-0.21 (-0.41)	-0.34 (-0.59)	0.08 (0.13)	0.29 (0.82)	-0.58 (-1.05)	-0.91 (-1.19)	-0.37 (-0.38)	0.20 (0.46)	-0.28 (-0.79)	-0.35 (-0.59)	0.25 (0.46)	0.53 (1.80)	-0.18 (-0.72)	-0.20 (-0.42)	0.27 (0.60)	0.45 (1.59)
R3	0.08 (0.16)	0.24 (0.41)	0.63 (1.01)	0.55 (1.57)	-0.76 (-1.39)	0.04 (0.05)	0.74 (0.75)	1.50 (3.43)	-0.63 (-1.80)	0.35 (0.58)	0.82 (1.51)	1.45 (4.96)	-0.47 (-1.88)	0.10 (0.21)	0.56 (1.26)	1.04 (3.67)
R3-R1	0.75 (1.09)	1.23 (1.63)	2.04 (2.48)	1.30 (2.94)	0.08 (0.10)	1.01 (1.14)	2.86 (2.79)	2.78 (5.38)	-0.19 (-0.36)	1.20 (1.65)	2.09 (2.99)	2.28 (6.73)	-0.28 (-0.68)	0.73 (1.30)	1.33 (2.45)	1.61 (5.81)
Sample Period : 1997-2000 (Crisis Period)																
R1	2.25 (0.05)	3.10 (0.42)	4.19 (0.30)	1.94 (0.30)	2.42 (0.68)	3.06 (0.67)	5.29 (0.36)	2.87 (0.50)	2.17 (0.62)	2.95 (0.90)	5.36 (0.02)	3.19 (0.04)	2.20 (0.60)	3.16 (0.81)	5.14 (1.36)	2.94 (1.92)
R2	0.86 (0.07)	1.47 (0.67)	1.70 (0.08)	0.85 (0.79)	1.87 (2.67)	2.46 (1.61)	2.87 (1.15)	1.00 (1.15)	1.43 (1.52)	1.94 (1.50)	2.45 (1.71)	1.01 (1.98)	1.11 (0.88)	1.87 (0.39)	2.65 (1.46)	1.54 (1.16)
R3	0.16 (0.51)	0.87 (1.71)	0.21 (1.50)	0.05 (1.96)	1.47 (1.30)	1.59 (1.62)	0.94 (1.20)	-0.53 (1.48)	1.11 (1.52)	1.18 (1.40)	0.84 (1.51)	-0.27 (1.25)	1.25 (1.00)	1.39 (0.14)	0.83 (0.01)	-0.31 (-0.09)
R3-R1	-2.08 (-0.06)	-2.22 (-1.98)	-3.98 (-2.17)	-1.90 (-4.34)	-0.95 (-1.95)	-1.47 (-1.06)	-4.35 (-2.14)	-3.40 (-5.58)	-1.06 (-0.49)	-1.76 (-1.12)	-4.52 (-2.46)	-3.46 (-3.68)	-0.95 (-0.59)	-1.71 (-2.31)	-3.92 (-2.16)	-2.45 (-3.45)
Sample Period: 2001-2007																
R1	-0.19 (-0.69)	-0.35 (-0.97)	-0.65 (-1.24)	-0.46 (-1.24)	0.02 (0.06)	-0.02 (-0.06)	-0.15 (-0.32)	-0.17 (-0.59)	0.08 (0.28)	0.01 (0.03)	-0.13 (-0.28)	-0.20 (-0.63)	0.20 (3.79)	0.00 (3.36)	-0.20 (2.13)	-0.40 (-0.25)
R2	0.77 (3.17)	0.57 (1.77)	0.53 (0.96)	-0.24 (-0.58)	0.55 (1.50)	0.51 (1.19)	0.77 (1.20)	0.22 (0.49)	0.55 (1.83)	0.56 (1.51)	0.87 (1.34)	0.32 (0.61)	0.80 (5.57)	0.50 (5.47)	0.90 (4.11)	0.10 (2.11)
R3	0.65 (2.68)	0.89 (2.79)	1.56 (2.82)	0.91 (2.25)	0.83 (2.25)	1.48 (3.44)	2.34 (3.67)	1.51 (3.41)	0.95 (3.14)	1.25 (3.38)	2.11 (3.25)	1.16 (2.23)	0.50 (3.00)	0.90 (2.19)	2.00 (3.43)	1.40 (2.86)
R3-R1	0.84 (2.32)	1.25 (2.62)	2.21 (2.92)	1.37 (2.52)	0.81 (1.68)	1.51 (2.52)	2.49 (3.25)	1.68 (3.44)	0.88 (2.18)	1.24 (2.64)	2.24 (3.06)	1.36 (2.48)	0.30 (1.99)	0.84 (2.13)	1.81 (3.16)	0.99 (2.48)

Panel D: Subsample Results, Returns on Portfolios Based on 52-Week High Price Momentum and Trading Volume

Portfolio	K=3				K=6				K=9				K=12			
	V1	V2	V3	V3-V1	V1	V2	V3	V3-V1	V1	V2	V3	V3-V1	V1	V2	V3	V3-V1
Sample Period: 1988-1996																
R1	-1.10 (-2.42)	-1.58 (-3.06)	-2.17 (-4.00)	-1.07 (-3.54)	-1.44 (-2.83)	-1.79 (-2.93)	-2.18 (-3.63)	-0.74 (-2.12)	0.03 (0.08)	-0.48 (-1.08)	-0.48 (-1.00)	-0.51 (-2.28)	-0.40 (-1.05)	-0.77 (-2.08)	-0.72 (-1.70)	-0.32 (-1.71)
R2	-0.70 (-1.35)	-0.85 (-1.58)	-0.44 (-0.74)	0.25 (0.87)	-0.95 (-1.61)	-1.26 (-1.99)	-0.58 (-0.75)	0.37 (1.17)	-0.29 (-0.86)	-0.08 (-0.16)	0.36 (0.66)	0.65 (2.37)	-0.48 (-1.79)	-0.44 (-1.04)	0.01 (0.02)	0.49 (1.26)
R3	0.38 (0.73)	0.44 (0.83)	1.00 (1.32)	0.60 (1.41)	0.06 (0.10)	0.26 (0.41)	0.90 (0.76)	0.80 (1.70)	0.15 (0.43)	0.78 (1.64)	1.90 (2.56)	1.80 (4.54)	-0.17 (-0.64)	0.31 (0.74)	1.03 (1.88)	1.20 (3.12)
R3-R1	1.47 (2.18)	2.03 (2.74)	3.20 (3.70)	1.70 (3.56)	1.50 (1.97)	2.05 (2.35)	3.10 (3.55)	1.50 (2.76)	0.11 (0.22)	1.26 (1.96)	2.40 (3.23)	2.30 (5.10)	0.24 (0.54)	1.08 (1.96)	1.75 (2.62)	1.52 (4.20)
Sample Period : 1997-2000 (Crisis Period)																
R1	3.64 (0.07)	4.36 (0.26)	5.72 (0.33)	2.08 (1.00)	3.95 (0.64)	5.10 (0.31)	6.79 (0.63)	2.84 (0.92)	2.08 (1.41)	2.72 (1.03)	4.38 (1.96)	2.30 (0.82)	1.47 (0.58)	2.00 (0.67)	3.99 (0.24)	2.52 (0.70)
R2	1.76 (0.06)	2.65 (0.02)	3.03 (0.00)	1.26 (0.08)	2.33 (0.10)	3.52 (0.10)	4.62 (0.09)	2.29 (0.90)	1.10 (1.71)	1.52 (1.84)	2.70 (0.81)	1.61 (0.77)	0.73 (0.07)	1.19 (0.01)	2.10 (0.00)	1.37 (0.02)
R3	0.33 (0.59)	0.85 (0.88)	0.65 (0.19)	0.37 (0.54)	0.88 (0.57)	1.81 (0.74)	2.30 (1.15)	1.47 (0.55)	0.53 (0.06)	0.81 (0.01)	0.39 (0.09)	-0.18 (-1.27)	0.00 (0.43)	0.32 (0.19)	0.14 (0.63)	0.14 (0.37)
R3-R1	-3.31 (-1.81)	-3.49 (-3.13)	-5.06 (-5.82)	-1.75 (-4.31)	-3.06 (-2.32)	-3.29 (-3.04)	-4.50 (-5.72)	-1.34 (-6.91)	-1.62 (-1.72)	-1.90 (-2.14)	-4.01 (-4.72)	-2.47 (-5.71)	-1.52 (-7.05)	-1.72 (-2.13)	-3.86 (-4.98)	-2.34 (-2.82)
Sample Period: 2001-2007																
R1	-0.65 (-1.85)	-1.02 (-2.23)	-1.74 (-3.22)	-1.09 (-3.10)	-0.31 (-0.89)	-1.02 (-2.70)	-1.66 (-4.14)	-1.34 (-4.23)	0.01 (0.05)	-0.12 (-0.34)	-0.50 (-1.40)	-0.52 (-2.12)	1.25 (4.24)	1.04 (2.46)	0.70 (1.70)	-0.55 (-1.94)
R2	-0.01 (-0.05)	-0.24 (-0.70)	-0.38 (-0.79)	-0.36 (-1.04)	-0.08 (-0.32)	-0.09 (-0.33)	-0.57 (-1.21)	-0.49 (-1.29)	0.51 (2.06)	0.81 (2.85)	0.50 (1.15)	-0.01 (-0.02)	1.22 (6.57)	1.57 (5.87)	1.36 (2.99)	0.14 (0.42)
R3	0.38 (1.40)	0.90 (1.86)	1.50 (2.39)	1.10 (2.17)	0.59 (2.40)	0.77 (2.74)	1.17 (2.47)	0.58 (1.50)	0.95 (3.84)	1.28 (4.51)	1.86 (4.26)	0.91 (2.87)	1.70 (7.42)	2.00 (7.18)	2.80 (5.74)	1.10 (3.75)
R3-R1	1.02 (2.42)	1.90 (3.03)	3.20 (4.05)	2.20 (3.76)	0.90 (2.25)	1.79 (4.00)	2.82 (4.67)	1.92 (3.96)	1.00 (2.44)	1.40 (3.19)	2.36 (4.29)	1.43 (3.72)	0.50 (2.02)	1.00 (2.58)	2.10 (3.74)	1.60 (4.19)

Panel E: Largest 50% of SET Stocks

Portfolio	K=3				K=6				K=9				K=12			
	V1	V2	V3	V3-V1	V1	V2	V3	V3-V1	V1	V2	V3	V3-V1	V1	V2	V3	V3-V1
JT's Individual Stock Returns Momentum Strategy																
R1	-0.25 (-1.82)	-0.49 (-2.52)	-0.61 (-3.11)	-0.36 (-3.59)	-0.25 (-0.52)	-0.39 (-0.71)	-1.07 (-1.54)	-0.82 (-2.22)	-0.02 (0.79)	-0.18 (-0.09)	-0.52 (-1.59)	-0.50 (-2.37)	0.05 (0.53)	-0.18 (-0.08)	-0.27 (-0.41)	-0.32 (-2.63)
R2	0.10 (0.31)	0.05 (-0.07)	0.11 (0.82)	0.01 (0.53)	0.05 (0.89)	0.67 (0.67)	0.37 (0.93)	0.32 (0.12)	0.17 (1.18)	0.27 (1.37)	0.53 (1.67)	0.36 (2.98)	0.17 (1.46)	0.05 (1.21)	0.38 (2.47)	0.21 (2.32)
R3	0.29 (0.48)	0.42 (1.34)	0.83 (2.27)	0.54 (2.59)	0.01 (1.08)	0.47 (2.73)	1.37 (3.47)	1.36 (4.29)	0.08 (1.86)	0.58 (3.11)	1.24 (4.93)	1.16 (5.67)	-0.02 (1.59)	0.33 (2.67)	1.09 (4.31)	1.11 (6.93)
R3-R1	0.54 (1.69)	0.91 (2.51)	1.44 (3.76)	0.90 (4.28)	0.26 (1.31)	0.86 (2.57)	2.44 (4.21)	2.18 (5.73)	0.10 (0.52)	0.76 (2.29)	1.76 (4.31)	1.66 (5.91)	-0.07 (-0.18)	0.51 (1.97)	1.36 (3.88)	1.43 (5.89)
52-Week high price Momentum Strategy																
R1	-0.57 (-1.18)	-1.12 (-3.27)	-1.80 (-4.67)	-1.23 (-6.82)	-0.52 (-0.61)	-1.17 (-1.49)	-1.72 (-3.57)	-1.20 (-2.67)	0.09 (1.37)	-0.11 (-1.07)	-0.18 (-1.65)	-0.27 (-5.00)	0.49 (1.17)	0.27 (0.02)	0.07 (0.29)	-0.42 (-2.61)
R2	0.27 (1.53)	-0.17 (-0.31)	0.11 (0.21)	-0.16 (-0.82)	0.20 (0.07)	0.02 (0.31)	0.17 (0.49)	-0.03 (-0.59)	0.19 (0.51)	0.20 (1.37)	0.27 (1.52)	0.08 (1.62)	0.15 (1.83)	0.57 (2.76)	0.21 (1.27)	0.06 (1.31)
R3	0.19 (1.59)	0.42 (2.96)	1.07 (2.51)	0.88 (0.71)	0.13 (1.99)	0.39 (3.89)	0.95 (4.31)	0.82 (5.28)	0.29 (2.42)	0.91 (3.86)	1.76 (5.76)	1.47 (5.92)	0.60 (2.61)	0.93 (3.54)	1.84 (4.29)	1.24 (5.82)
R3-R1	0.76 (2.89)	1.54 (3.76)	2.87 (4.59)	2.11 (5.47)	0.65 (2.54)	1.56 (3.07)	2.67 (5.16)	2.02 (6.24)	0.20 (2.29)	1.02 (3.68)	1.94 (4.82)	1.74 (7.83)	0.11 (1.98)	0.66 (2.47)	1.77 (4.44)	1.66 (5.19)

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The results are consistent with the previous parts, there is no evidence of the momentum returns in the crisis period, 52-week high portfolios strategy significantly outperform the JT portfolio in both sub-sample periods; the pre-crisis (1988-1997) and the post-crisis (2001-2007). The volume-based 52-week high portfolio significantly outperforms the volume-based JT portfolios in every categories of trading volume stocks.

4. Size, and Book-to-Market Effects Control

To compare the four momentum portfolio strategies with more careful and powerful tool, I use the tests that based on Fama–MacBeth (1973) style cross-sectional regressions, which control for the effects of firm size, book to market, and enable us to compare all momentum strategies simultaneously.

The dependent variable in these regressions is the month- t return to stock i , $R_{i,t}$. The independent variables are dummies that indicate whether stock i is held (either long or short) in month t as part of one of the four strategies. Conditionally, I control the market capitalization ($size_{i,t}$) and book-to-market ($BTM_{i,t}$). Coefficients on the dummies enable us to separately examine the return to a single strategy in isolation from the other three momentum strategies, while also controlling for size and book-to-market.

The profit from a winner or loser portfolio in month t for a (6, 6) strategy formed in six-month formation periods and hold for six-month periods. The contributions of the various portfolios formed in month $t - 1$ to the month t return can be obtained by estimating the following regression:

$$R_{i,t} = b_0 + b_1 size_{i,t} + b_2 BTM_{i,t} + b_3 JH_{i,t-1} + b_4 JL_{i,t-1} + b_5 GH_{i,t-1} + b_6 GL_{i,t-1} + b_7 JHV3_{i,t-1} + b_8 JHV1_{i,t-1} + b_9 JLV3_{i,t-1} + b_{10} JLV1_{i,t-1} + b_{11} GHV3_{i,t-1} + b_{12} GHV1_{i,t-1} + b_{13} GLV3_{i,t-1} + b_{14} GLV1_{i,t-1} + e_{it}$$

where $JH_{i,t-1}$ equals one if stock i 's past performance over the 6-month period is in the top 30% when measured by JT's performance criterion, and is zero otherwise; $JL_{i,t-1}$ equals one if stock i 's past performance over the period is in the bottom 30% when measured by JT's performance criterion, and is zero otherwise. The variables GH and GL are defined similarly based on the 52-week high strategy. The variables $JHV3_{i,t-1}$ ($GHV3_{i,t-1}$) and $JLV3_{i,t-1}$ ($GLV3_{i,t-1}$) are classified with the same criteria measured by

JT's performance and 52-week high strategy, with having the past trading volume in the highest 30%. The variables $JHVI_{i,t-1}$ ($GHVI_{i,t-1}$) and $JLVI_{i,t-1}$ ($GLVI_{i,t-1}$) are classified with the same criteria with having the past trading volume in the lowest 30%.

According to Fama (1976), the coefficient estimate b_{0t} can be interpreted as the return to a neutral portfolio that has zeroed (hedged) out the effects of size, the book-to-market, and momentum identified by all strategies; and b_{3t} as the month t return to a zero investment portfolio that is long JT winner stocks but that has also hedged out all other effects. In other words, b_{3t} can be viewed as the return in excess of b_{0t} that can be earned by taking a long position in a pure JT winner portfolio. Estimates of the remaining coefficients have similar interpretations.

The returns to (6, 6) strategies involve portfolios formed of the prior six months, where the individual coefficients are computed from cross-sectional monthly regressions. The time-series averages of the month-by-month estimates of these premium returns, and associated t -statistics, are reported in Table VIII. The average profit that is related exclusively to each of the different momentum investing strategies can be readily obtained from the figures reported in the table. For instance, the difference between the JT winner and JT loser dummies represents the return from a zero investment portfolio that is long pure JT winners and short pure JT losers. The top panel of Table VIII reports the regression results of pure winner and pure loser from all the momentum strategies. Profits from the four momentum strategies and significance tests appear in the bottom panel.

These results for (6, 6) strategies mirror those Table that represented earlier. The 52-week high outperforms the JT momentum strategies in every categories of trading volume stocks. Consistent with the prior evidences that the portfolio formed by 52-week high price momentum strategy in high volume stocks produce the most profitable portfolio invest in the Stock Exchange of Thailand (SET).

The significance of regression coefficients on the JT and GH dummies is less for (6, 12) than (6, 6) strategies; but in all cases, the coefficients on the high volume 52-week dummies significantly outperform the others.

Table VIII

Size, and Book-to-Market Effects Control: the Comparison of Momentum Strategies

Each month between January 1988 and December 2007, separated out the crisis period, which spanned over 1997-2000). Monthly cross-sectional regressions of the following form are estimated for (6, 6) and (6, 12) strategies, respectively:

$$R_{i,t} = b_0 + b_1 size_{i,t} + b_2 BTM_{i,t} + b_3 JH_{i,t-1} + b_4 JL_{i,t-1} + b_5 GH_{i,t-1} + b_6 GL_{i,t-1} + b_7 JHV3_{i,t-1} + b_8 JHVI_{i,t-1} + b_9 JLV3_{i,t-1} + b_{10} JLVI_{i,t-1} + b_{11} GHV3_{i,t-1} + b_{12} GHVI_{i,t-1} + b_{13} GLV3_{i,t-1} + b_{14} GLVI_{i,t-1} + e_{it},$$

where $R_{i,t}$ and $size_{i,t}$ are the return and the market capitalization of stock i in month t ; $JH_{i,t-1}$ ($JL_{i,t-1}$) is the JT individual stock returns winner (loser) dummy, which equals one if stock i 's past performance over the six-month period is in the top 30% when measured by JT's performance criterion, and is zero otherwise; $JL_{i,t-1}$ equals one if stock i 's past performance over the six-month period, is in the bottom 30% when measured by JT's performance criterion, and is zero otherwise. The variables GH and GL are defined similarly for the 52-week high strategy. The variables $JHV3_{i,t-1}$ ($GHV3_{i,t-1}$) and $JLV3_{i,t-1}$ ($GLV3_{i,t-1}$) are classified with the same criteria measured by JT's performance criterion and GH's 52-week high strategy with having the past trading volume in the high 30%. The variables $JHVI_{i,t-1}$ ($GHVI_{i,t-1}$) and $JLVI_{i,t-1}$ ($GLVI_{i,t-1}$) are classified with the same criteria measured by JT's performance criterion and 52-week high strategy with having the past trading volume in the low 30%. The coefficient estimates of a given independent variable are monthly cross-sectional regressions. The annual returns (*Year 1*, *Year 2*, *Year 3*, *Year 4*, and *Year 5*) are computed as event time returns for five 12-month periods, following the six-month formation strategy. The numbers reported in the tables are the time-series averages of these averages. They are returns in percentage per month. The t -statistics (in parentheses) are calculated from the times series.

	Monthly Return ($J=6$)		Annual Event Time Returns with Monthly Rebalancing Portfolios ($J=6$)				
	$K=6$	$K=12$	Year 1	Year 2	Year 3	Year 4	Year 5
Intercept	0.15 (3.04)	0.08 (2.56)	1.35 (4.54)	1.95 (3.28)	1.89 (4.37)	1.65 (3.93)	2.1 (4.74)
Size	-0.01 (-5.17)	-0.01 (-5.49)	-0.09 (-6.11)	-0.12 (-2.48)	0.08 (1.84)	0.09 (1.58)	0.07 (1.72)
Book to Market	0.0003 (2.58)	0.0001 (2.26)	0.005 (3.41)	0.008 (2.96)	0.002 (1.43)	0.002 (1.07)	0.001 (1.86)
JT Winner dummy	0.05 (3.57)	0.02 (2.15)	0.72 (4.22)	-0.28 (-3.90)	-0.83 (-5.31)	-0.33 (-3.23)	-0.11 (-2.54)
JT Loser dummy	-0.08 (-9.98)	-0.07 (-10.21)	-0.88 (-5.84)	-0.17 (-0.67)	-0.37 (-2.01)	0.05 (0.92)	-0.04 (-0.37)
52-week Winner dummy	0.07 (4.37)	0.05 (1.97)	0.57 (3.56)	0.27 (2.08)	0.21 (1.76)	0.15 (0.82)	-0.17 (-0.37)
52-week Loser dummy	-0.12 (-7.59)	-0.10 (-5.24)	-1.68 (-4.12)	-0.42 (-2.72)	-0.31 (-0.93)	-0.51 (-1.27)	0.04 (-1.94)
JT High volume winner dummy	0.12 (6.49)	0.10 (5.13)	1.26 (7.86)	-0.02 (-0.34)	-0.65 (-2.49)	-0.27 (-1.97)	-0.09 (-0.18)
JT High volume loser dummy	-0.06 (-11.27)	-0.04 (-14.57)	-2.11 (-11.26)	0.14 (1.46)	0.04 (1.08)	0.18 (1.59)	0.02 (1.02)
JT Low volume winner dummy	0.02 (1.14)	0.02 (1.16)	0.18 (1.67)	-0.54 (-2.51)	-1.01 (-5.64)	-0.39 (-2.51)	-0.13 (-1.34)
JT Low volume loser dummy	-0.04 (-2.05)	-0.01 (-2.16)	-0.35 (-2.27)	-0.68 (-2.88)	-0.78 (-3.67)	-0.08 (-1.01)	-0.10 (-1.28)
52-week High volume winner dummy	1.85 (4.92)	1.64 (5.84)	0.72 (4.58)	0.32 (2.49)	0.36 (2.51)	0.29 (2.21)	-0.02 (-0.57)
52-week High volume loser dummy	-1.14 (-5.59)	-0.81 (-6.00)	-1.83 (-4.28)	-0.57 (-2.81)	-0.46 (-2.67)	-0.66 (-2.82)	0.11 (0.72)
52-week Low volume winner dummy	0.08 (2.59)	0.07 (2.41)	0.42 (0.53)	0.12 (0.47)	0.06 (0.69)	0.01 (0.07)	-0.26 (-1.57)
52-week Low volume loser dummy	-0.4 (-4.26)	-0.4 (-2.15)	-1.53 (-2.67)	-0.27 (-1.17)	-0.01 (-0.91)	-0.36 (-2.45)	-0.17 (-1.98)
JT Winner - Loser Dummy	0.13 (2.19)	0.09 (2.01)	1.6 (4.28)	-0.11 (-0.69)	-0.46 (-2.13)	-0.38 (-1.97)	-0.07 (-0.21)
52-week Winner -Loser Dummy	0.19 (3.67)	0.15 (3.18)	2.25 (6.44)	0.69 (1.92)	0.52 (1.08)	0.66 (1.27)	-0.21 (-1.18)
JT High Vol Winner - Loser Dummy	0.18 (3.39)	0.14 (3.04)	3.37 (7.53)	-0.16 (-1.27)	-0.69 (-3.54)	-0.45 (-2.28)	-0.11 (-0.82)
JT Low Vol Winner - Loser Dummy	0.06 (2.15)	0.03 (1.98)	0.53 (3.04)	0.14 (0.92)	-0.23 (-1.94)	-0.31 (-2.01)	-0.03 (-0.64)
52-week High Vol Winner - Loser Dummy	2.99 (6.87)	2.45 (6.15)	2.55 (6.57)	0.89 (1.17)	0.82 (1.29)	0.95 (1.46)	-0.13 (-1.12)
52-week Low Vol Winner - Loser Dummy	0.48 (3.24)	0.47 (2.64)	1.95 (4.52)	0.39 (0.82)	0.07 (0.13)	0.37 (0.59)	-0.09 (-1.07)

5. Long-Term Reversals

Next, analyze the extent to which the momentum of stocks with extreme rankings reverses in the long run. The analysis is provided in Table VIII, column 4-8, except that the holding time is larger than six-month holding, to be one-year holding. With the identical formation concept, using $J =$ six months period, where the individual coefficients are computed from separate monthly cross-sectional regressions. For example, past performance is measured in the six month period, the stocks are held for five-12 months to find the annual returns, Year one, two, three, four, and five. This allows us to test whether momentum persists, reverses, or disappears in longer horizons.

The bottom sector of the table report returns from the all momentum strategies, JT's stock returns, 52-week high price, JT's stock returns in high/low trading volume, and 52-week high price in high/low momentum strategies. Comparing these figures with those of the (6, 12), the bottom sector of Table VIII indicates how much of the initial return to following these strategies reverses in the subsequent months. For example, the return to a (6, 12) JT strategy is 0.09% per month with the significant t-statistic of 2.01. In annual return of Year 3, indicates that this strategy earns a significant -0.46% per month with the significant negatively t-statistic of 2.13. For high volume JT strategy, the return to a (6, 12) is 0.14% per month with the significant t-statistic of 3.04. In annual return of Year 3, indicates that this strategy earns a significant -0.69% per month with the significant negatively t-statistic of 3.54. For low volume JT strategy, the return to a (6, 12) is 0.03% per month with the significant t-statistic of 1.98. In annual return of Year 3, indicates that this strategy earns a significant -0.23% per month with the significant negatively t-statistic of 1.94.

According to the output, the regressions strongly prove the reversal of the volume-based/ non-volume-based JT momentum strategies. For the 52-week high strategy there is no evidence of reversals for winners or losers, low volume or high volume. The coefficient estimates are all generally insignificant. With the prior studies of George and Hwang (2004), they find the impact of the bias on returns is most strongly related to nearness of a stock's current price to its 52-week high. In this thesis investigation, I make a continuation further from GH (2004) and LS (2000) on discovering the interaction of the 52-week high price momentum strategy and the trading volume. Nevertheless, reversals do not occur for this strategy. Taken together, this suggests that long-term reversals are unrelated to the primary bias that gives rise to short-term predictability.

CHAPTER V CONCLUSION

This study presents the comparison of investment strategies between the volume-based 52-week high price momentum and the volume-based JT (stock returns) momentum strategies in the Stock Exchange of Thailand (SET) over 20-year time horizon, spanning over 1988-2007, separating out crisis period of 1997-2000, using the approach of buying past winner stocks and selling past loser stocks grouped by two momentum strategies; JT and 52-week high momentum strategy. The first strategy measures the past return performance of individual stocks and takes a long (short) position in the 30% of top (bottom) performing stocks, which was proposed by Jegadeesh and Titman (1993). The Second strategy, measures performance of individual stocks by reference to how close the current price is to the 52-week high, which was based on the studies of George and Hwang (2004), long (short) positions are taken in stocks whose current price is close to (far from) the 52-week high.

From the results of the study, there are four keys conclusions. First, consistent with George and Hwang (GH, 2004), the evidences indicate the outperforming of 52-week high price momentum portfolios over the JT momentum strategy, statistically and economically. However, there is no evidence of 52-week low momentum profitability in the portfolios. Price of stocks that are winners relative to the 52-week low may tend to be above their fundamental values. When this pricing error is corrected, there would be an offset to the returns.

Second, following Lee and Swaminathan (LS, 2000), the portfolios are formed based on the interactions of past trading volume and momentum strategies – that is JT momentum strategy and the 52-week high momentum strategy. As expectedly, the results present that volume-based 52-week high price momentum strategy forecasts higher returns than the JT momentum strategy in every categories of trading volume stocks. Trading volume contains information help the investors to distinguish between the stocks that possibly give a strong profit in the portfolios and those that are not, to improve the original momentum profitability. The evidence suggests that traders who use information contained in the volume statistic will do “better” than traders who do not.

Third, the interaction of momentum strategies and trading volume aspect provides two keys importance. Firstly, consistent with Lee and Swaminathan (2000),

returns of the momentum in both strategies is more pronounced among high volume stocks than low volume stocks. The particular effect is stronger in the strategy of 52-week high price momentum. However, contrast with LS (2000) who found that buying past low volume winner and selling past high volume loser was the most profitable, we find that buying past high volume winner and selling past high volume loser gains higher future momentum returns in the Stock Exchange of Thailand (SET). All the evidences object their theory of Momentum Life Cycle (MLC).

Finally, similar to the prior studies of George and Hwang (2004) and Lee and Swaminathan (2000), volume-based/non volume-based JT portfolios are able to experience long-term reversals in the next five years. Conversely, 52-week high does not reverse in the long-term horizon; also, the similar patterns happened in the contribution studied of volume-based 52-week high price momentum strategy, no long-term reversal. The results support the phenomenon separation of short-term momentum and long-term reversals. In contrast, the results don't support the theory of Lee and Swaminathan (2000) about the Momentum Life Cycle (MLC) to explain the long-run reversal in the Stock Exchange of Thailand (SET).

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APPENDIX

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APPENDIX

In this section of Thesis research, present the results of the investigation, using data from January 1988- December 2007 without separating the crisis period off, which in the body part of the thesis, is excluded that particular period, in order to get the actual momentum results. However, the results in this section that include all the 20-year sample periods were produced before the results that presented in the body parts. Since there is no momentum evidence occurred in the SET, the author continued to work on the robustness test and finally found the proxy that driven away and conceal all the momentum results, which is the impact from the crisis period. As provided in the research, the author separated out the crisis period in order to explain the momentum strategies, possibly practical in the SET.

1. Sample Data

The sample consists of all firms listed on the SET during the period January 1988 through December 2007 with at least two years of data prior to the portfolio formation date, not separating out the crisis period of 1997-2000. I eliminate firms that were delisted within five days of the portfolio formation date and firms whose stock price as of the portfolio formation date was less than a dollar. Finally, to be included in the sample, a stock must also have available information on past returns, trading volume, market capitalization, and stock price.

2. Empirical Results

2.1 The JT Stock Return Momentum strategy

According to the result provided on Table I.1, there is no evidence of momentum appearance in any portfolio of the Individual stock returns momentum strategy (JT). For example, for six-month formation period ($J = 6$), losers lost an average of 1.02 percent per month, winners gained 0.9 percent per month, over the next three months, the different between R3 and R1 ($R3 - R1$) or the self-financing portfolio lost 0.1 percent per month, which means, there is no appearance of the momentum anomaly over the next three months. Even though the different between R3 and R1 portfolios of the next six and nine months are positive of 0.3 percent and 0.04 percent per month, respectively, with the insignificant t-statistic of 0.69 and 0.09 shown in the parentheses below the returns numbers. There is no predictability power of the stock return momentum strategy over the experimental portfolio. However, there is a strong appearance of the reversal in a long term horizon, mostly Year 3, 4, and 5 on all the portfolios that formed by JT's stock

returns momentum strategy. For example, for six-month formation period ($J = 6$), losers lost an average of 28.5 percent per month, winners gained 10.4 percent per month, over the next three years annual event time returns, the different between R3 and R1 ($R3 - R1$) or the self-financing portfolio lost 18.1 percent per month, with the significant t-statistic of 2.98 shown in the parentheses, means that there is the significant signal of long term reversal in the next 3 years.

2.2 52-Week High Price Momentum Strategy

According to the result provided on Table WEI.1, presents the result based on the 52-week high price momentum strategy. According to the evident from the table, there is no signal of momentum anomaly in any portfolio of 52-week high (low) price momentum strategy as well. For example, losers lost an average of 1.20 percent per month, winners gained 1.38 percent per month, over the next three months, the self-financing portfolio ($R3 - R1$) gain only 0.17 percent per month with the insignificant t-statistic of 0.43, which means, there is no appearance of the momentum anomaly over the next six months.

The last five columns of Table WEI.1 report the annual event-time returns, which report no signal of long-term reversal. For example, Year 3, the $R3 - R1$ portfolio lost 3.23 percent annual year return with insignificant negative t-statistic of 0.89. Contrasting from the individual stock returns momentum portfolio strategy, there is no signal of reversal occurrence on the portfolio that formed by GH's 52-week high price and 52-week low price momentum strategies, formed in any holding periods.

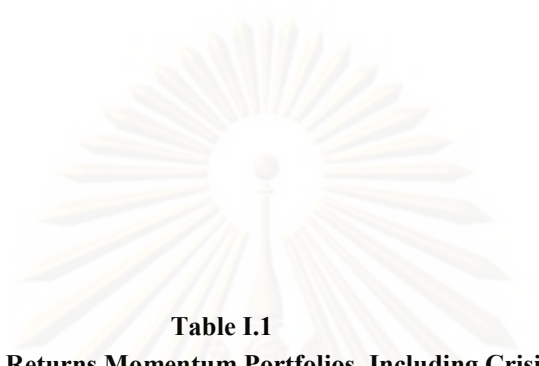


Table I.1

Individual Stock Returns Momentum Portfolios, Including Crisis Period

This table presents average monthly and annual returns in percentages for JT's individual stock returns momentum portfolio strategies involving SET stocks for the time period from 1988 to 2007, without separating Crisis Period. At the beginning of each month starting in January 1988, all stocks in the SET are sorted based on their previous J months' returns and divided into 3 equal-weighted portfolios. $R1$ represents the *loser* portfolio with the lowest returns, and $R3$ represents the *winner* portfolio with the highest returns during the previous J months. K represents monthly holding periods where $K=$ three, six, nine, or 12 months. Monthly holding period returns are computed as an equal-weighted average of returns from strategies initiated at the beginning of this month and past months. The annual returns (*Year 1, Year 2, Year 3, Year 4, and Year 5*) are computed as event time returns for five 12-month periods following the portfolio formation date. *Return* refers to the geometric average monthly return in percentages, and *Volume* represents the average daily turnover in percentages, both measured over the portfolio formation period, J . *Size* represents the time-series average of the median size on the portfolio formation date. *Price* represents the time-series average of the median stock price of the portfolio in THB on the portfolio formation date. The numbers in parentheses represent t -statistics.



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<i>J</i>	Portfolio	<i>Return</i>	<i>Volume</i>	<i>Size</i>	<i>Price</i>	Monthly Return				Annual Event Time Returns				
						<i>K</i> = 3	<i>K</i> = 6	<i>K</i> = 9	<i>K</i> = 12	Year 1	Year 2	Year 3	Year 4	Year 5
3	R1	-5.09	2.7461	4,306.88	49.26	0.92 (2.30)	1.31 (4.29)	1.21 (4.54)	1.56 (4.80)	19.12 (4.94)	14.81 (5.31)	28.38 (3.92)	21.47 (4.91)	20.60 (3.83)
	R2	0.14	1.6581	5,205.47	54.53	1.07 (3.59)	1.70 (6.16)	1.99 (8.08)	2.10 (9.66)	25.68 (9.47)	22.74 (6.68)	17.70 (6.62)	21.89 (7.74)	21.72 (7.04)
	R3	8.67	2.8964	6,050.25	54.21	0.97 (3.26)	1.37 (4.96)	1.46 (5.93)	1.25 (5.73)	16.93 (6.25)	14.26 (4.19)	10.59 (3.96)	12.63 (4.46)	12.32 (3.99)
	R3-R1					0.05 (0.10)	0.06 (-0.82)	0.25 (0.69)	-0.31 (-0.85)	-2.19 (-0.49)	-0.55 (-0.13)	-17.79 (-2.90)	-8.84 (-1.84)	-8.28 (-1.50)
6	R1	-4.02	1.8797	3,825.15	47.99	1.00 (2.52)	1.20 (4.05)	1.32 (4.64)	1.54 (5.13)	19.81 (5.12)	15.86 (5.34)	28.46 (4.00)	23.15 (4.15)	24.80 (3.80)
	R2	0.30	1.8843	5,267.89	52.61	1.09 (3.66)	1.71 (5.95)	2.00 (8.42)	2.21 (9.98)	26.73 (9.71)	24.05 (8.35)	18.54 (6.98)	22.35 (7.57)	18.49 (5.97)
	R3	8.94	3.1551	6,414.76	51.07	0.91 (3.06)	1.49 (5.18)	1.35 (5.68)	1.20 (5.41)	15.52 (5.64)	11.61 (4.03)	10.41 (3.92)	12.82 (4.34)	10.96 (3.54)
	R3-R1					-0.09 (-0.18)	0.29 (0.69)	0.03 (0.09)	-0.34 (-0.97)	-4.29 (-0.95)	-4.24 (-1.03)	-18.05 (-2.98)	-10.34 (-1.88)	-13.83 (-2.27)
9	R1	-3.28	2.0678	3,714.43	47.72	0.90 (2.60)	1.34 (4.50)	1.49 (5.46)	1.69 (6.00)	20.87 (6.12)	18.61 (5.11)	30.08 (4.18)	28.52 (4.05)	25.02 (3.89)
	R2	0.39	1.8345	5,380.45	52.49	1.01 (3.25)	1.67 (6.02)	1.96 (8.24)	2.18 (9.51)	26.70 (9.39)	23.22 (9.81)	16.57 (5.93)	18.90 (6.28)	19.67 (6.63)
	R3	8.78	3.0620	6,397.04	59.13	1.11 (3.58)	1.41 (5.06)	1.28 (5.39)	1.18 (5.15)	15.45 (5.43)	10.27 (4.34)	11.82 (4.23)	12.14 (4.04)	10.26 (3.46)
	R3-R1					0.21 (0.45)	0.07 (0.16)	-0.21 (-0.58)	-0.51 (-1.43)	-5.42 (-1.24)	-8.34 (-2.08)	-18.26 (-2.94)	-16.38 (-2.61)	-14.76 (-2.49)
12	R1	-2.76	1.9605	3,609.48	46.89	1.12 (2.82)	1.53 (5.12)	1.64 (6.07)	1.80 (6.27)	22.67 (6.36)	21.29 (4.82)	27.79 (4.14)	33.10 (3.93)	27.16 (3.90)
	R2	0.46	2.0441	5,029.09	52.90	1.06 (3.68)	1.71 (6.29)	1.97 (7.96)	2.19 (9.27)	26.75 (9.07)	22.25 (9.47)	19.59 (7.18)	16.68 (5.57)	17.62 (5.93)
	R3	8.90	3.0266	6,465.15	60.71	0.85 (2.94)	1.25 (4.61)	1.22 (4.93)	1.15 (4.87)	14.89 (5.05)	9.78 (4.16)	11.45 (4.20)	12.09 (4.04)	9.48 (3.19)
	R3-R1					-0.27 (-0.58)	-0.28 (-0.69)	-0.42 (-1.16)	-0.65 (-1.77)	-7.78 (-1.71)	-11.51 (-2.64)	-16.34 (-2.78)	-21.00 (-2.98)	-17.69 (-2.85)

Table II.1

Returns of the 52-Week High/Low Price Momentum Portfolios

This table presents the average equal-weighted monthly returns of portfolios that are created based on 52-week high price momentum strategy and 52-week low price momentum strategy, involving all the stocks in the SET during the period from January 1988 to December 2007. At the beginning of each month stocks are sorted into three equally-weighted portfolios according to the ratio of the current price to its 52 week high (low). Stocks with the lowest ratio, furthest (nearest) from the 52-week high (low) price, are assigned to the loser portfolio (R1). Stocks with the highest ratio, nearest (furthest) to the 52-week high (low) price are assigned to the winner portfolio (R3). (R3-R1) represents the 52 week-high/low price momentum strategy of winner –loser portfolio. K represents monthly evaluation periods (K = three, six, nine and 12 months). Monthly holding period returns are computed as an equal-weighted average of returns from strategies initiated at the beginning of this month and past months. The annual returns (*Year 1, Year 2, Year 3, Year 4, and Year 5*) are computed as event time returns for five 12-month periods. *Return* refers to the geometric average monthly return in percentages, and *Volume* represents the average daily turnover in percentages, both measured over the six-month portfolio formation period, $J = 6$. *Size* represents the time-series average of the median size on the six-month portfolio formation date. *Price* represents the time-series average of the median stock price of the portfolio in THB on the six-month portfolio formation date. The numbers in parentheses represent t -statistics.

Panel A: The Strategy of 52-Week High Price Momentum														
Portfolio	Return	Volume	Size	Price	Monthly Return				Annual Event Time Returns					
					$K = 3$	$K = 6$	$K = 9$	$K = 12$	Year 1	Year 2	Year 3	Year 4	Year 5	
52 week high ratio	R1	-1.79	2.9867	2,683.66	29.65	0.86 (1.83)	1.20 (3.41)	1.26 (4.03)	1.42 (4.34)	18.08 (4.52)	15.45 (4.21)	14.32 (4.13)	11.80 (3.92)	12.75 (4.26)
	R2	1.82	3.4685	5,585.82	24.50	0.80 (3.18)	1.15 (4.83)	1.18 (5.44)	1.20 (5.78)	15.51 (6.01)	11.00 (5.22)	13.07 (6.30)	14.22 (6.73)	12.14 (5.36)
	R3	4.37	3.0549	6,727.40	53.51	0.99 (3.92)	1.38 (5.76)	1.37 (6.32)	1.28 (6.16)	16.37 (6.34)	10.53 (5.00)	11.09 (5.35)	12.03 (5.70)	10.32 (4.56)
	R3-R1					0.13 (0.27)	0.17 (0.43)	0.11 (0.31)	-0.14 (-0.39)	-1.70 (-0.39)	-4.92 (-1.31)	-3.23 (-0.89)	0.24 (0.07)	-2.42 (-0.67)
Panel B: The Strategy of 52-Week Low Price Momentum														
52 week low ratio	R1	-2.13	2.0594	3,957.86	21.53	1.22 (2.87)	1.38 (4.49)	1.37 (5.07)	1.53 (5.54)	18.32 (5.54)	12.13 (3.96)	21.05 (3.84)	13.52 (4.68)	12.69 (4.57)
	R2	1.13	2.8350	5,365.11	19.27	1.15 (2.70)	1.59 (5.16)	1.65 (6.11)	1.76 (6.40)	21.17 (6.40)	15.73 (5.13)	22.11 (4.04)	27.20 (9.42)	26.27 (9.46)
	R3	6.74	2.9616	6,833.26	17.59	1.30 (4.20)	1.79 (5.85)	1.97 (5.93)	1.95 (5.83)	23.40 (5.83)	25.76 (4.43)	10.85 (4.29)	12.36 (5.49)	12.71 (5.07)
	R3-R1					0.07 (0.15)	0.41 (0.94)	0.60 (1.44)	0.42 (1.00)	5.07 (1.00)	13.64 (2.39)	-10.19 (-2.02)	-1.15 (-0.32)	0.02 (0.01)

BIORGRAPHY

Peemmica Laksanaboonsong, raised in Nonthaburi, Thailand, graduated in 2001 from Benjama-rachanusorn School. She entered Chulalongkorn University that summer in a Faculty of Commerce and Accountancy, Major in Accounting. While studies, she attended in many voluntarily University activities, such as joining the Fencing Club as the University sportsman and being the club treasurer. In her senior year, she was a Teacher Assistant for Associate Professor Sumon Malasit and involved in several translation assignments. After graduated in May 2005, she worked as an associated consultant in Financial Advisory Service for about a year. Working in the financial environment inspired her to the financial field. In year 2007, she enrolled and studied in the Master of Science in Finance (MSF) program at Chulalongkorn University.



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