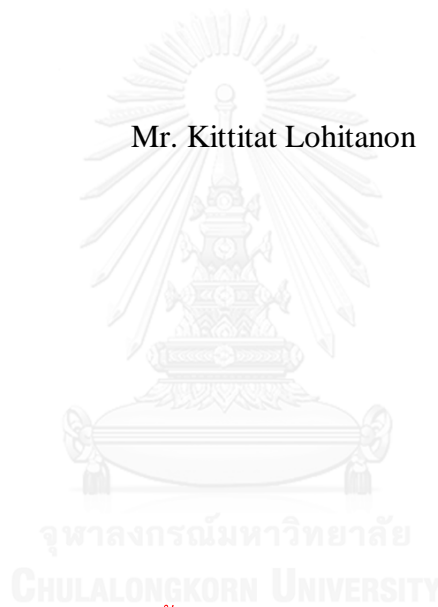


STYLE INVESTING OF VARIOUS INVESTOR TYPES IN THAILAND

Mr. Kittitat Lohitanon



บทคัดย่อและแฟ้มข้อมูลฉบับเต็มของวิทยานิพนธ์ตั้งแต่ปีการศึกษา 2554 ที่ให้บริการในคลังปัญญาจุฬาฯ (CUIR)  
เป็นแฟ้มข้อมูลของนิสิตเจ้าของวิทยานิพนธ์ ที่ส่งผ่านทางบัณฑิตวิทยาลัย

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สไลด์อินเวสติ้งของนักลงทุนแต่ละประเภทในประเทศไทย



วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิทยาศาสตรมหาบัณฑิต

สาขาวิชาการเงิน ภาควิชาการธนาคารและการเงิน

คณะพาณิชยศาสตร์และการบัญชี จุฬาลงกรณ์มหาวิทยาลัย

ปีการศึกษา 2558

ลิขสิทธิ์ของจุฬาลงกรณ์มหาวิทยาลัย



กิตติชัย โลหิตานนท์ : สไตลอินเวสติงของนักลงทุนแต่ละประเภทในประเทศไทย  
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อ.ที่ปรึกษาวิทยานิพนธ์หลัก: ดร. สุภารัตน์ ตันทงศักดิ์กุล, 73 หน้า.

วิทยานิพนธ์ฉบับนี้ได้ทำการศึกษาดังพฤติกรรมการลงทุนแบบสไตล์ของนักลงทุนทั้งหมด 4 ประเภท ในตลาดหลักทรัพย์แห่งประเทศไทย ในช่วงระยะเวลาปี พ.ศ. 2542 – 2556 โดยการศึกษาครั้งนี้มุ่งเน้นค้นหาว่า นักลงทุนแต่ละประเภทนั้นได้นำกลยุทธ์การลงทุนแบบสไตล์ไปใช้หรือไม่ และ นักลงทุนแต่ละประเภทนั้นมีสไตล์การลงทุนที่ตัวเองประสงค์หรือไม่ โดยในการศึกษานี้จะมีการใช้สไตล์ใน 3 มิติคือ ขนาดของบริษัท, มูลค่าและการเติบโต และโมเมนตัม ซึ่งผลการศึกษาพบว่านักลงทุนทุกประเภทนั้นได้นำการลงทุนแบบสไตล์ไปใช้เป็นกลยุทธ์หนึ่งในการลงทุน การศึกษานี้ยังได้ทำการเปรียบเทียบสถานะการลงทุนในสไตล์ของนักลงทุนในสไตล์ต่างๆกับค่ามาตรฐาน ซึ่งผลการศึกษาแสดงให้เห็นว่า นักลงทุนต่างชาติมีความประสงค์ที่จะลงทุนในหุ้นขนาดกลาง, หุ้นมูลค่า และหุ้นที่มีผลตอบแทนในอดีตต่ำที่สุด ส่วนนักลงทุนสถาบันในประเทศถูกพบว่ามีวัตถุประสงค์ที่จะลงทุนในหุ้นขนาดใหญ่, หุ้นมูลค่า และหุ้นที่ในอดีตมีผลตอบแทนสูงที่สุด สำหรับเทรดเดอร์ของสถาบันและนักลงทุนส่วนบุคคลถูกพบว่ามีวัตถุประสงค์ที่จะลงทุนในหุ้นเติบโต และหุ้นที่ในอดีตมีผลตอบแทนต่ำที่สุด แต่ผลการศึกษาค้นพบว่าเทรดเดอร์ของสถาบันมีความประสงค์ที่จะลงทุนในหุ้นขนาดกลาง ส่วนนักลงทุนส่วนบุคคลมีความประสงค์ที่จะลงทุนในหุ้นขนาดเล็ก

จุฬาลงกรณ์มหาวิทยาลัย  
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ภาควิชา การธนาคารและการเงิน

ลายมือชื่อนิติกร .....

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This study examines the style trading behavior of 4 investor types in Stock Exchange of Thailand during 1999-2013. This study aims to identify two questions. First, do investors employ style trading strategy as one of their trading strategy? Second question is investors have their specific preference style or not. By categorizing stocks into 3 style dimensions: size, value/growth, and momentum, the evidence is found that style trading strategy is used by all type of investors. Furthermore, after comparing each type of investor's style position with benchmark, evidence is found that each type of investor has their own preference style. Foreign investors prefer to invest in medium size, value, and lowest past return stocks. On contrary, institutional investors prefer to invest in large size, value, and highest past return stocks. Proprietary and individual investors prefer to trade in growth and lowest past return stocks. However, proprietary traders prefer to trade in medium size stocks while individual investors prefer to invest in small size stocks.

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## 1. Introduction

In a financial world, many different financial products have been divided into various categories and classes such as fixed income, equity, derivative and commodity. As well as stocks, they can be classified into different types by using their characteristic: small-cap stocks, large-cap stocks or value stocks. The category of the similar characteristic stocks can be called “style”, and the process that investors allocate their fund among styles is so-called “style investing” (Barberis & Shleifer, 2003). However, from Fama and French (1992), size and book-to-market equity characteristics are admitted by both academics and practitioners. Therefore, they use these two characteristics for classification stocks into each style.

Investors who pursue this style investing achieve at least two benefits from. Firstly, it reduces the number of choices; thus, investors can make their decision more easily due to their fund allocation only among styles rather than into each individual assets or stocks. Secondly, portfolio performance has been evaluated effectively since the portfolio can be compared with a benchmark which has similar style. For example, if we want to evaluate the Fidelity small cap stock performance, we should compare Fidelity small cap stock fund with Russell 2000 index which is the representative for small cap stock rather than S&P 500 index which is the representative of overall market.

The theory of style investing is first introduced by Barberis and Shleifer (2003). In their theory, they separate investors into two types: positive feedback traders who they call “switchers” and fundamental traders. The positive feedback traders, who normally consider a *relative* style past performance for a future investment decision, would only do style investing; in contrast, the fundamental traders would invest money

along in individual assets. Barberis and Shleifer (2003) theory shows that style which fundamental changes and has well past performance return attracts the presence of switchers. In a presence of them, they make price of style rises over its fundamental value but price of style returns to its fundamental value eventually. However, from their assumption, the switchers consider their investment base only on relative style past performance so their presence doesn't affect only their interested style but also effect other styles especially opposite style, for example, large-cap stocks is the opposite style of small-cap stocks. Therefore, the switchers tend to withdraw fund from the worse past performance style to invest in better past performance style. This effect makes other style prices devalue from its fundamental value particularly the opposite style. However, after prices of style devalue, they reverse to their fundamental eventually. The reversal of style price to its fundamental value comes from two reasons: the bad news of well past performance style and good news of other styles. The unsatisfactory information makes fundamental traders sell this well performance style which causes reversing of style price from overvalue to its fundamental value. While, the good news of other styles make them more interesting which attach investment flows from switchers and fundamental traders. It makes price of these other styles return from undervalue to their fundamental value. Furthermore, the style investing theory also states that if only one asset's fundamental in style changes, the impact doesn't occur only this asset's price but affects all another assets price in that style. In Barberis and Shleifer (2003) style investing model, assuming that other asset prices are constant, only one asset price changing make style price which is average of all asset prices change. This style price changing draws an attention from switchers. Making them allocate their capital into this style. It means that all assets in style are received fund

which making assets price change. Therefore, price of other assets is affected from only one asset fundamental changes.

Most importantly, Barberis and Shleifer (2003) theory has stated three interesting implications. First, the correlation of return between assets has become more intensive than their fundamental's correlation since assets have been categorized in same style. On the other hand, when assets have been categorized in different style, their fundamental's correlation dominates return correlation. There are many evidences which are consistence with this implication. Fama and French (1993) unveil that there is common factor in return of small stocks and value stocks. Furthermore, Fama and French (1995) observe this factor and find that fundamental factor isn't the main driven factor of return. Pindyck and Rotemberg (1988) find out that many commodities have a price comovement more than fundamental can explain. Moreover, Froot and Dabora (1999) study the movement of similar stocks as Royal Dutch and Shell. These two stocks have the same cash flow stream but are traded in different markets. Royal Dutch is in S&P 500 index while Shell is in FTSE index. Froot and Dabora (1999) reveal that Royal Dutch comoves more with S&P 500 index because investors consider S&P 500 index as style. As same reason for Shell, It comoves with FTSE index more. Second, each style has had a life cycle. Its value could deviate from its fundamental at one period of time but it should return to fundamental value eventually. This implication is consistence with Lo and MacKinlay (1988) and Poterba and Summers (1988) find that U.S. monthly stock returns have positively autocorrelated at first lag and negatively autocorrelated with their past one month return and negatively autocorrelated after past one month return. This evidence represents that U.S. stocks have life cycle. In addition, Lewellen (2002) shows that monthly returns on industry and size sorted portfolio are

also positively autocorrelated at a past one month return and negatively autocorrelated after past one month return. As Chan et al. (2000) explain the interesting evidence of style effect. During 1998 and 1999, value stocks have high earning and sales growth but they tend to perform poorly. In contrast, growth stocks tend to outperform value stocks. Their result explains that this phenomenon comes from large growth stocks performance speculation. This speculation attracts capitals out from value stocks, opposite style with growth stocks, flows into large growth stocks. Finally, Barberis and Shleifer (2003) theory suggests that style level momentum strategy and style level value strategy have been able to create abnormal return. Many studies provide supporting evidence for style momentum strategy such as Moskowitz and Grinblatt (1999) show that in an industry level, momentum strategy is profitable. Haugen and Baker (1996) investigate into many investment styles and find that styles which have well past performance give a high risk-adjusted return.

Inspired by Barberis and Shleifer (2003), many empirical studies try to investigate implications of this style investing theory. Teo and Woo (2004) show that the reversal of styles are persistence and style value strategy is profitable on annually time horizons. In contrast, they reveal that style momentum strategy performs poorly comparing with style value strategies. Barberis et al. (2005) show that stocks which are included in S&P500 index greatly move in same direction with S&P500 index. This is caused by the effect of investor's behavior who consider S&P500 index as one of style. Then, they allocate their fund either in or out S&P500 index. This makes all stocks in S&P500 move in same direction. Consistently, Wahal and Yavuz (2013) show that style return has an ability to predict stock return. In addition, there are two literatures which explore the style trading behavior in each investor type. First, Froot and Teo (2008)

investigate institutional style trading behavior in U.S. They reveal that institutional investors choose to invest in style more than random selecting stock. They also find that style investing has an impact on expected return of stock. Consistently, Kumar (2009) also discovers that individual investors in U.S. prefer style investing and this style investing is an important factor which determines stock return.

In Thailand, the importance of style investing has increased recently as a result of the dramatically increasing of institutional investor and mutual fund since they prefer style investing as one of their strategy. Accordingly, Kokasemsook (2012) examines the effect of the style investing upon stocks by conducting Thai data set. By cross-sectional regression between stock returns and past style returns, He documents that style return is a crucial factor in a stock return prediction. Also Roongwatanayothin (2011) who inspired by Barberis and Shleifer (2003) and Teo and Woo (2004), tries to explore the profitability of style-level momentum and value strategies in Thailand. His result is consistence with Teo and Woo (2004), he reveals that the style-level value strategy generates a significant profit in annually time period. This means that poorly past performance style tend to do well in the future. However, the style-level momentum strategy is weak and significant only in quarterly time period. From the growing of literatures about style investing in Thailand, this makes the style investing be interesting for further investigation.

Overall, growing of empirical studies shows the important of style investing. However, there are not many studies investigate deeper into style that each investor types prefer. Past literatures choose to investigate only whether each type of investors use style investing or not? Gompers and Metrick (1998) who study the institutional

investors' stock preference in U.S., unveil that institutional investors in U.S. prefer to invest in large stocks which have high liquidity. Moreover, the value stocks are also preferred by institutional investors too. Dahlquist and Robertsson (2001), who investigate the foreign investors' behavior in Sweden, also find the similar result with Gompers and Metrick (1998). They document that foreign investors heavily demand for stocks which have large market capitalization, high liquidity, low book-to market equity and listed in international markets. For institutional investors, they also prefer stocks which have same characteristics with foreign investors' preference. However, for individual investors, their demand is different from foreign and institutional investors. They prefer to invest in small capitalization and high book-to-market equity stocks.

Moreover, past stock return is the other characteristic which also affects the behavior of investors. In behavioral finance field, trading behaviors of investor can be divided into 2 groups which are momentum and contrarian. For momentum investors, they allocate their capital into groups of stocks which perform well in the past while contrarian investors do opposite. They invest in group of stocks that perform poorly in the past. These inspire many researchers and lead them to identify the behavior which each investor type exhibit. Numerous studies have found that foreign investors tend to be positive feedback traders such as Froot et al. (2001) who find that foreign investors use positive feedback strategy and their fund flow can be used to predict future returns of emerging market. show that foreign investors in Finland also pursue positive feedback trading strategy but domestic investors do opposite. On the other hand, many literatures reveal that individual investors are negative feedback traders. Choe et al. (1999) and Kaniel et al. (2008) find evidences that individual investors in Korea and

U.S. tend to be contrarian traders. For institution investors, mix results are revealed. Lakonishok et al. (1992) disclose that U.S. institutional investors follow momentum strategy while Phansatan et al. (2012) unveil that Thai institutional investors pursue contrarian strategy. At last, literatures do not unveil proprietary traders' behavior.

Inspired by Froot and Teo (2008), who analyze institutional investors data in U.S., and Kumar (2009), who explores individual investors trading behavior in U.S. Both of researches are conducted by U.S. market data. In U.S. market, institutional investors are dominant players and it is composed of plentiful listed companies so style identification is more convenience. Unlike those researches, this study investigates whether the style investing phenomenon is available in dynamic emerging market like Thailand or not. Therefore, this study conducts the Thailand data set which is different from U.S. data set. In Thailand, most of trading is dominated by individual investors and a number of listed companies in Thailand is less than U.S.

Inspired by aforementioned, this study attempts to investigate intensively to the style trading behavior of all investor types in Thai stock market simultaneously, composed of foreign investor, institutional investor, proprietary investor and individual investor by addressing 2 main questions. First, do investors in Thailand pursue style investing as their investment strategy? Second if investors use style investing, what are the styles that investors prefer? By focusing 3 style dimensions, size, B/M equity and one year momentum effect of Jegadeesh and Titman (1993). The study of style trading behavior is possible due to the availability of high-frequency trading data from Stock Exchange of Thailand (*SET*).



From observing style effects for each investor type in Thailand, this research can create new aspect of how investors actually behave. It extends the existing literatures in a way that take into account the style classification when examining the investor trading behavior. This research is conducted in Thai stock market which is in developing phase for both regulation and financial products. Therefore, this study might identify the difference between stock market in developed countries and Thailand which can attract regulators, academics and practitioners for improving financial regulation and product which can support style investors to trade at style level more convenience.



## 2. Literature review

The theory of style investing is created by Barberis and Shleifer (2003). In their model, they split investors into 2 types. First one is switchers or positive feedback investors and the other is fundamental traders or arbitrageurs. Switchers are investors who invest at style level and allocate their fund among. They allocate their fund into well past performance style relative with others. On the other hand, they withdraw their fund from style which gives poor past performance compares with other styles. Fundamental traders are investors who invest in asset level and try to prevent the deviation of each asset price from its expected price. In addition, their model shows that each asset's price doesn't simply equal cash flow expectation in the future but it equals cash flow expectation plus effect from switchers. The demand shock from switchers makes price of asset deviates from its fundamental value in one period of time.

From the model proposed by Barberis and Shleifer (2003), they create three important predictions. First, for assets which are categorized into the same style, their return correlation dominates their fundamental correlation. As example, if only one asset in style X receives good fundamental news, all assets' price in style X increase even they don't have a similar fundamental. Second, from the presence of switchers, who exhibit positive feedback trading behavior, making style returns positively autocorrelated in short run but reversing to negatively autocorrelated in long run. Moreover, the presence of switchers can affect two opposite styles returns are negatively cross-autocorrelated in short run. From example, when switchers are attracted into style X, they drive price of style X away from its fundamental value. At the same time, they have to withdraw fund from style Y. This makes price of style Y

depreciates from its fundamental value. Eventually, when the attractive of style X is deteriorated or style Y fundamental is more attractive. Switchers move fund out from style X to style Y. This action depreciate price of style X back to its fundamental value and appreciate price of style Y to its fundamental value. Third, Style-level value and momentum strategies are profitable.

### **2.1. Empirical studies in style investing**

Teo and Woo (2004) show the result which is consistent with style investing model proposed by Barberis and Shleifer (2003). Their study mainly focuses on momentum and reversals of style return. By classifying stocks into 2 dimensions using size and value/growth, this creates 9 style portfolios composed with small-growth style, small-blend style, small-value style, mid-cap-growth style, mid-cap-blend style, mid-cap-value style, large-growth style, large-blend style, large-value style. In addition, they use the equally weight of CRSP mutual fund returns in each style portfolio to be a proxy for style portfolio return. After they sort the style portfolios based on their past return, the return of portfolio are regressed with Fama and French (1993) three-factors model and Carhart (1997) four factors model. Their result reveals that portfolio with worst past performance can create abnormal return at annually time horizon while abnormal return of best past performance portfolio is weak at quarterly time horizon. This result supports implication of style investing theory by Barberis and Shleifer (2003). Likewise, Roongwatanayothin (2011), who investigates the style effect in Stock Exchange of Thailand, also find the result corresponding with the Teo and Woo (2004). The result shows that style-level momentum is weak at quarterly time period and style-level reversal shows strong effect at annually time period.

Further, Wahal and Yavuz (2013) also find an evidence which supports the style investing model by Barberis and Shleifer (2003). Their study directly investigates the ability of style-level return for predicting asset-level return. They find that past style return is the significant predictor of future stock return. In addition, the style investing model predicts that stocks should comove with the style that they are categorized. Therefore, Wahal and Yavuz (2013) argue that the different degree of comovement between each stock and its style can be used to create strategy which generate profit. Therefore, in their study, they sort the stocks into 10 portfolios by its past return. Then, they again sort stocks in each portfolio into 3 groups by using comovement between stocks return and portfolio return, i.e. highest comovement, middle comovement and lowest comovement. Their result shows that return of highest comovement group in every portfolios create a highest return and lowest comovement group in every portfolios generate a lowest return. This result is also consistence with Kokasemsook (2012). He investigates the effect of style investing in Stock Exchange of Thailand. His result shows that past style return factor has weak predictability power to predict individual stock return and the different level of comovement can generate variation of returns.

## **2.2. Existence of style investing and style preference among investors**

From the theoretical model proposed by Barberis and Shleifer (2003), this raises a question whether this behavior of style investing really exists in reality world or not? Froot and Teo (2008) study this behavior in U.S. institutional investors. To investigate in style investing behavior, they divide stocks by considering 3 style dimensions: small/large, value/growth and sector/industry. They divide stocks into 10

style portfolios for each style dimension and explore the flow of U.S. institutional investors into each style portfolio. The institutional investors' flow reveals that institutional investors allocate their fund in styles rather than randomly choosing stocks. Furthermore, they also show that U.S. institutional investors allocate their fund in pattern which consistence with Barberis and Shleifer (2003). They allocate fund from extremely opposite style to another extreme style. For example, they allocate fund from small cap style to big cap style, both of this two styles are extremely opposite style. In consistent with Kumar (2009), he shows that U.S. individual investors also pursue style investing rather than randomly investing in stocks. He directly investigates to individual investors' style preference. He constructs the individual investors' position in each style portfolio from overall individual investors' transaction. In addition, his result reveals that extreme portfolios are special portfolios for individual investors. When individual investors feel optimist in certain style such as value stocks, they feel pessimism about opposite style such as growth stocks. Furthermore, he finds that individual investors prefer stocks which are small-cap, value and cheap stocks.

From Kumar (2009), showing that individual investors have their specific style preference. Therefore, each investor type should has their specific style preference as same as individual investors. Gompers and Metrick (1998) study the relationship between institutional investors and stocks in U.S. They use the cross-sectional regression for finding the stock characteristics which affect institutional ownership. In their result, the size factor has positive correlation with institutional ownership which means that institutional investors prefer to invest in large size firms. However, in their result, book-to-market equity shows the negative correlation with institutional ownership. This represent that institutional investors prefer to invest in growth stocks.

Dahlquist and Robertsson (2001) also find result which have some consistency with Gompers and Metrick (1998). In their research, they try to investigate the effect of firm characteristics on foreign and institutional ownership in Sweden. They conclude that foreign and institutional investors have the similar preference. They prefer to invest in large size company. Nevertheless, their result suggests that foreign and institutional investors prefer to invest in growth. In addition, individual investors, their result reveals that individual investors in Sweden would like to invest in small size and value stocks which is opposite with foreign and institutional investors.

However, not only size and book-to-market equity characteristics are used as style dimensions but past return of stocks is also one of interesting style. In behavioral finance field, the trading behavior of investor is divided into 2 groups which are positive feedback and negative feedback behavior. Investors who pursue positive feedback or momentum strategy invest in well past performance stocks. On the contrary, negative feedback or contrarian traders pursue poorly past performance stocks. Making past return of stock is attractive for being identified as style because it can be used to identify the trading behavior of investor. Several of literatures try to identify the trading behavior of each investor type. Foreign investors are found to follow positive feedback strategy. The evidence is revealed by Froot et al. (2001). Their study explores the relationship of international investors flow and the local equity return. After finding the covariance between flow and return, their evidence reveals that the correlation between lagged equity return and net inflow is positive. This evidence unveils that international investors pursue positive feedback trading. Their result is also consistent with Kamesaka et al. (2003) who investigate the investment behavior of various investor types in Japan. They show that the foreign net trade imbalance and past stock return are

positively correlated after performing a time series regression of weekly past stock return on weekly net trade imbalance. Similarly, Grinblatt and Keloharju (2000) also demonstrate that foreign investors in Finland exhibit momentum trading behavior. They argue that foreign investors are the professional fund managers who try to achieve superior performance so they decide to use momentum strategy.

To deviate from foreign investors, the trading behavior of institutional investors is found to be fused between momentum and contrarian pattern. Edelen and Warner (2001) find the evidence that U.S. institutional investors pursue momentum trading strategy. They find that the aggregate daily mutual fund flows are positively correlated with one-day lagged market returns. Furthermore, Lakonishok et al. (1992) identify that U.S. institutional investors pursue positive feedback strategy for small cap stocks. However, there are some evidences which support that institutional investors are negative feedback traders. Phansatan et al. (2012) reveal that institutional investors in Thailand exhibit contrarian trading behavior. The result is consistent with Kamesaka et al. (2003), who find that institutional net trade imbalance is negatively correlated with lagged of stock return.

For individual investors, many empirical studies reveal that they tend to be a contrarian trader. For example, Kaniel et al. (2008) reveal that the individual net trade is negatively correlated with past stock return. In other word, individual investors tend to sell after the increasing of stocks price and they tend to buy after stock prices fall. In addition, they find that after individual buying (selling), they can observe positive (negative) excess return. Therefore, they argue that individual investors exhibit contrarian behavior because they receive compensation for providing liquidity to

institutional investors. Choe et al. (1999), who investigate the foreign investors' behavior in Korea. They also find the consistent result that when foreign investors heavily sell out stocks, Korean individual investors strongly buy these stocks from foreign investors. Similarly, Grinblatt and Keloharju (2000) find that domestic investors in Finland are contrarian trade.





### 3. Research question & Hypothesis development

From previous literatures, they indicate that style is an important factor which affects stock return and style investing strategy can create an abnormal return. Furthermore, many literatures try to investigate deeper whether each investor type considers this style effect for their trading or not. Therefore, these raise a first question for this study “Do investors in emerging market such as Thailand employ the style investing?” However, for each investor type who participates in market, they have their specific preference styles which differ from other investors. This led to a second question “What are the preference styles for each investor type?”

For investors who pursue style investing, they have to categorize similarly characteristic stocks into style first such as small size style, large size style, value style. Then, they allocate their capital into these styles. From this procedure, it helps investors make a decision easier by reducing number of choices for investing. In addition, the style investing model, proposed by Barberis and Shleifer (2003), states that an abnormal return can be created by using style investing strategy and recently support by Teo and Woo (2004). Therefore, if style investing is truly benefit and can generate abnormal return, investors should more likely to employ this strategy for their investing. From this argument, it leads to the following hypothesis:

***Hypothesis 1: Style investing is employed by every type of investors.***

*Hypothesis 1-1: Foreign investors exhibit style investing behavior.*

*Hypothesis 1-2: Institutional investors exhibit style investing behavior.*

*Hypothesis 1-3: Individual investors exhibit style investing behavior.*

However, each investor type should have their preference styles because of different condition. Then, I expect that each type of investor should have their own specific style preference. As a professional money manager, foreign and institutional investors have to manage enormous amount of money for their client. Furthermore, they are expected to beat the market in constricted time period. Then, I expect that they have to invest in large market capitalization and liquidity stocks which are adequate for their capital. In addition, they should capture growth stocks and pursue a positive feedback strategy for outperforming the market in the limited time horizon. Supported by Dahlquist and Robertsson (2001), their result also suggests that foreign and institutional investors in Sweden prefer to invest in large size and growth firms. Moreover, from Phansatan et al. (2012), they document that foreign investors in Thailand pursue momentum trading strategy but Thai institutional investors pursue contrarian trading strategy. From this evidence, leading me to another two hypothesizes:

***Hypothesis 2: Foreign investors have specific style preference.***

*Hypothesis 2-1: Foreign investors prefer to invest in large market capitalization style.*

*Hypothesis 2-2: Foreign investors prefer to invest in low book-to-market equity style.*

*Hypothesis 2-3: Foreign investors prefer to invest best past performance style.*

***Hypothesis 3: Institutional investors have specific style preference.***

*Hypothesis 3-1: Institutional investors prefer to invest in large market capitalization style.*

*Hypothesis 3-2: Institutional investors prefer to invest in low book-to-market equity style.*

*Hypothesis 3-3: Institutional investors prefer to invest in worst past performance style.*

On the other hand, for individual investors, their capital isn't large as institutional or foreign investors so their investment is more flexible. They can invest in small-cap and less liquidity stocks. Unlike professional money manager, individual investors aren't expected to outperform market in constricted time horizon. Thus, individual investors should prefer to invest in value stocks which provide a return in long time horizon. These are supported by Kumar (2009), He shows that individual investors in U.S. prefer to invest in small size and value stocks. In addition, Phansatan et al. (2012) reveal that individual investors in Thailand exhibit contrarian trading behavior. This led me to last hypothesis:

***Hypothesis 4: Individual investors have specific style preference***

*Hypothesis 4-1: Individual investors prefer to invest in small market capitalization style.*

*Hypothesis 4-2: Individual investors prefer to invest in high book-to-market equity style.*

*Hypothesis 4-3: Individual investors prefer to invest in worst past performance style.*

#### 4. Data

The primary data for this empirical analysis is the intraday transaction data of all listed firms in Stock Exchange of Thailand (SET) from period 1999-2013. The transaction data is collected by SET. The transaction data, recorded in every execution, are composed of deal date, deal time, name of security, execution volume, and execution price. Furthermore, SET also separates investors into four types: foreign investors, institutional investors, individual investors, and proprietary traders. It records the type of investor who executes the order into transaction data.

In addition, several standard data are used in this study. For each stock in sample, stocks price, stocks return, market capitalization, past one year return and book-to-market equity value are obtained from Thompson Reuters DataStream.

## 5. Methodology

### 5.1. Style identification

The first step towards examining the style trading behavior is style identification. For style identification, 3 stock characteristics data are used to define the style dimensions: size, book-to-market equity (BEME) and one year momentum in stock return. For these three styles, the same sample of stocks is sorted by their property and then divided into style portfolios.

The first style dimension, size, is based on market capitalization sorting and then they are divided into five equal-capitalization style portfolios. Following Fama and French (1992) size of year  $t$  is defined as market capitalization of company at the end of June on year  $t$ . This method is repeated every year.

For second style dimension, value and growth, Firms' book-to-market equity (BEME) value are used to be a criteria for sorting. Then, five equal capitalization style portfolios are constructed. Following Fama and French (1992), the book equity value is based in fiscal year calendar year  $t-1$  and market equity is based in end of December of year  $t-1$ . This method ensures that accounting variables are known before the sorting procedure and is repeated every year.

For last style dimension, one year momentum in stock return, Jegadeesh and Titman (1993) reveal that selecting stocks based on their previous one year return is the best momentum strategy. Therefore, at the beginning of every year, stocks in sample are sorted based on their past one year returns. Then, they are divided into five equal-capitalization style segments. This procedure is repeated every year.

## 5.2. Aggregate daily net investment flows of style portfolio

After identifying style, the daily net investment flows in each stock is aggregated up. This daily net investment flow is the order imbalance of each investor type. Then, each stock is composed of four type daily net investment flows: foreign, institutional, individual and proprietary daily net investment flows:

$$F_{i,j,t} = \text{Buying Value}_{i,j,t} - \text{Selling Value}_{i,j,t} \quad (1)$$

- $F_{i,j,t}$  = Daily net investment flows into stock  $i$  by investor type  $j$  at day  $t$
- $\text{Buying Value}_{i,j,t}$  = Net buy value of stock  $i$  by investor type  $j$  at day  $t$
- $\text{Selling Value}_{i,j,t}$  = Net sell value of stock  $i$  by investor type  $j$  at day  $t$

After receiving the daily net investment flows ( $F_{i,j,t}$ ) into stock  $i$  by investor type  $j$  during day  $t$  for each stock, for each style dimension, the daily net investment flows into each style portfolio is calculated as follow:

$$F_{k,j,t} = \sum_{i=1}^n F_{i,j,t} \quad (2)$$

- $F_{k,j,t}$  = Daily net investment flow into style segment  $k$  by investor type  $j$  at day  $t$
- $F_{i,j,t}$  = Daily net investment flows into stock  $i$  by investor type  $j$  at day  $t$
- $n$  = number of stocks that are in style  $k$  portfolio

## 5.3. Aggregate daily market capitalization of style portfolio

The daily market capitalization in each style portfolio is aggregated up as follow:

$$m_{k,t} = \sum_{i=1}^n m_{i,t} \quad (3)$$

- $m_{k,t}$  = Market capitalization of style  $k$  portfolio at day  $t$
- $m_{i,t}$  = Market capitalization of stock  $i$  at day  $t$
- $n$  = number of stocks that are in style  $k$  portfolio

#### 5.4. Style investing behavior of each investor type

For identifying the degree of style investing, reallocation intensity from Froot and Teo (2008) is employed for methodology.

##### 5.4.1. Degree of style investing (Reallocation Intensity)

The reallocation intensity is developed by Froot and Teo (2008) for measuring the magnitude of institutional style investing in their defined style. In each style dimension, the model is a comparison between a moving of investors' fund across defined style portfolios and the benchmark which is a moving of investors' fund across randomly defined style portfolios. This degree of style investing measurement should signal that style is an important factor for investor's reallocation decision or not.

By applying the reallocation intensity method from Froot and Teo (2008). This degree of style investing is the standard deviation of net investment flows across style portfolios:

$$\sigma_{j,t}^f = \left( \sum_{k=1}^5 \left( \frac{m_{k,t}}{\sum_k m_{k,t}} \left( \frac{F_{k,j,t}}{m_{k,t}} - \frac{\sum_k F_{k,j,t}}{\sum_k m_{k,t}} \right)^2 \right) \right)^{0.5} \quad (4)$$

- $\sigma_{j,t}^f$  = Reallocation intensity of investor type  $j$  at day  $t$
- $F_{k,j,t}$  = Daily net investment flow into style portfolio  $k$   
by investor type  $j$  at day  $t$
- $m_{k,t}$  = Market capitalization of style portfolio  $k$  at day  $t$
- $\sum_k F_{k,j,t}$  = Daily net investment flow into market by investor type  $j$  at day  $t$
- $\sum_k m_{k,t}$  = Market capitalization of market at day  $t$

From the standard deviation of net investment flow equation, the excess net investment flow of investor  $j$  in style portfolio  $k$  at day  $t$  is defined by  $F_{k,j,t}/m_{k,t} - \sum_i F_{k,j,t} / \sum_i m_{k,t}$ .

Moreover, Froot and Teo (2008) suggest that there are problems from investors' long-term preference for each style portfolios. Then, to extract investors' long term preference out from reallocation intensity as follow:

$$\sigma_{j,t}^{\bar{f}} = \left( \sum_{k=1}^5 \left( \frac{m_{k,t}}{\sum_k m_{k,t}} \left( \frac{F_{k,j,t}}{m_{k,t}} - \frac{\sum_k F_{k,j,t}}{\sum_k m_{k,t}} - E \left( \frac{F_{k,j,t}}{m_{k,t}} - \frac{\sum_k F_{k,j,t}}{\sum_k m_{k,t}} \right) \right)^2 \right) \right)^{0.5} \quad (5)$$

The additional expectation term in equation (4) is the time series mean of the excess net investment flows into style portfolio  $k$  from investor  $j$ . This represents investors' long-term preference of style portfolio  $k$ . Therefore, this equation truly represents degree of style investing which is not due to investors' long-term preference.

From the equation (3) and (4), they don't reveal the degree of style investing expectation under null hypothesis which can be used to identify whether style trading occur or not. Therefore, Monte Carlo exercise is applied for creating a benchmark. All of steps are as follow:

- 1) Randomly sorting all of stocks in sample into five equally weighted style portfolios
- 2) Calculating the daily net investment flows into each style portfolio  $k$  by investor type  $j$  at day  $t$  ( $F_{k,j,t}$ )
- 3) Calculating market capitalization in each style portfolio  $k$  ( $m_{k,t}$ )
- 4) Calculating reallocation intensity of investor type  $j$  at day  $t$  ( $\sigma_{j,t}^f$ ) and reallocation intensity of investor type  $j$  at day  $t$  excluded style portfolio preference ( $\sigma_{j,t}^{\bar{f}}$ )
- 5) Repeating procedure 1) – 4) 10,000 times



- 6) Finding average value of all 10,000  $\sigma_{j,t}^f$  ( $E[\sigma_{j,t}^f]$ ) and 10,000  $\sigma_{j,t}^{\bar{f}}$  ( $E[\sigma_{j,t}^{\bar{f}}]$ ) at day  $t$

After that,  $t$ -statistic is used to test a statistically significant of difference between reallocation intensity ( $\sigma_{j,t}^f, \sigma_{j,t}^{\bar{f}}$ ) and its expectation value ( $E[\sigma_{j,t}^f], E[\sigma_{j,t}^{\bar{f}}]$ ). In addition,  $t$ -statistic is adjusted by using Newey-West method for overcoming autocorrelation and heteroskedasticity. To test the first hypothesis, if investors employ this style investing as their strategy, the difference value between reallocation intensity and its expectation value should be statistically significant.

### 5.5. Style preference of each investor type

For identifying the style preference of each investor type, I employ style preference measurement from Kumar (2009).

#### 5.5.1. Style preference measurement

This method is presented by Kumar (2009) for inspection whether individual investors in U.S. systematically shift their preferences across style portfolios or not. For each style dimension, each investor type's positions in every defined style portfolios are calculated as follow:

$$POS_{k,j,t} = \frac{\sum_{t=1}^t \sum_{i=1}^{N_{k,t}} n_{i,j,t} P_{i,t}}{Abs(\sum_{t=1}^t \sum_{i=1}^{N_t} n_{i,j,t} P_{i,t})} \quad (6)$$

- $POS_{k,j,t}$  = Investor type  $j$  end of day  $t$  position in style portfolio  $k$ .
- $N_{k,t}$  = Number of stocks in style portfolio  $k$  at the end of day  $t$ .
- $N_t$  = Number of all stocks in overall market at the end of day  $t$ .
- $n_{i,j,t}$  = Number of stock  $i$  shares in investor type  $j$  portfolio at the end of day  $t$ .
- $P_{i,t}$  = Price of stock  $i$  at the end of day  $t$ .

From equation (5), this  $POS_{k,j,t}$  is the weight of style portfolio  $k$  that investor  $j$  hold in portfolio at the end of the day  $t$ . To test hypothesis 2, I use the unexpected style position as a benchmark of investors' style preference in day  $t$  which is defined as

$$UPOS_{k,j,t} = POS_{k,j,t} - EPOS_{k,j,t} \quad (7)$$

- $UPOS_{k,j,t}$  = unexpected position of style portfolio  $k$  in the investor type  $j$  portfolio at the end of day  $t$ .
- $EPOS_{k,j,t}$  = expected position of style portfolio  $k$  in investor type  $j$  portfolio at the end of day  $t$ .

Two  $EPOS_{k,t}$  are used to be a position benchmark. First is the weight of each style portfolio in market portfolio which is calculated as follow:

$$EPOS_{k,j,t} = \frac{m_{k,t}}{\sum_k m_{k,t}} \quad (8)$$

- $m_{k,t}$  = Market capitalization of style  $k$  portfolio at day  $t$
- $m_{i,t}$  = Market capitalization of stock  $i$  at day  $t$

Second, by applying the Monte Carlo exercise, All of steps are as follow:

- 1) Randomly sorting all of stocks in sample into five equally weighted style portfolios
- 2) Calculating investor type  $j$  end of day  $t$  position in all of style portfolio  $k$  ( $POS_{k,j,t}$ )
- 3) Repeating procedure 1) – 2) 10,000 times
- 4) For each style portfolio  $k$ , finding average value of all 10,000  $POS_{k,j,t}$  ( $EPOS_{k,j,t}$ ) at end of day  $t$

For  $UPOS_{k,j,t}$ , it measures the investor  $j$  preference of style portfolio  $k$ . To test hypothesis two to four, if investors truly prefer style portfolio  $k$ , they should weigh

style portfolio  $k$  more than a benchmarks of style portfolio  $k$  significantly. Therefore,  $UPOS_{k,j,t}$  should be positive. For statistically significant testing,  $t$ -statistic is used to test the different between  $POS_{k,j,t}$  and  $EPOS_{k,t}$ . In addition,  $t$ -statistic is adjusted by using Newey-West method for overcoming autocorrelation and heteroskedasticity.



## 6. Result

### 6.1. Descriptive Statistic

Fig1 illustrates the daily aggregated net trading value during the sample period January 1999 to December 2013. It indicates that SET index is inactive during year 1999 through year 2002 then it becomes uptrend during year 2003 to beginning of year 2004. During the inactive period 1999 – 2002, foreign investors sell most of stocks out and they are collected by individual investors. After inactive period during 2003-2004, this is the uptrend period of SET index, institutional and individual investors are investors who aggregately buy stocks while foreign investors sell stock out extensively. After this uptrend period, SET index is volatile during trading year 2004 to beginning of year 2008. The major buyer in this period is foreign investors while the major seller is individual investors. Year 2008 is the worse year of SET index because of crisis. This made SET index sharply declines from around 900 point to 400 point. Between this crisis period, foreign investors redeem investments from stocks but both individual and institutional investors massively buy stocks from foreign investors. However, during year 2009 – 2012, SET index becomes bullish by moving from 400 points to 1600 points. This period, major buyer is foreign investors and the major sellers are individual and mutual investors. However, in year 2013, SET index is highly volatile from foreign investors who heavily sell out stocks to both mutual and individual investors. In addition, proprietary investors are investors who don't aggregate their portfolio.

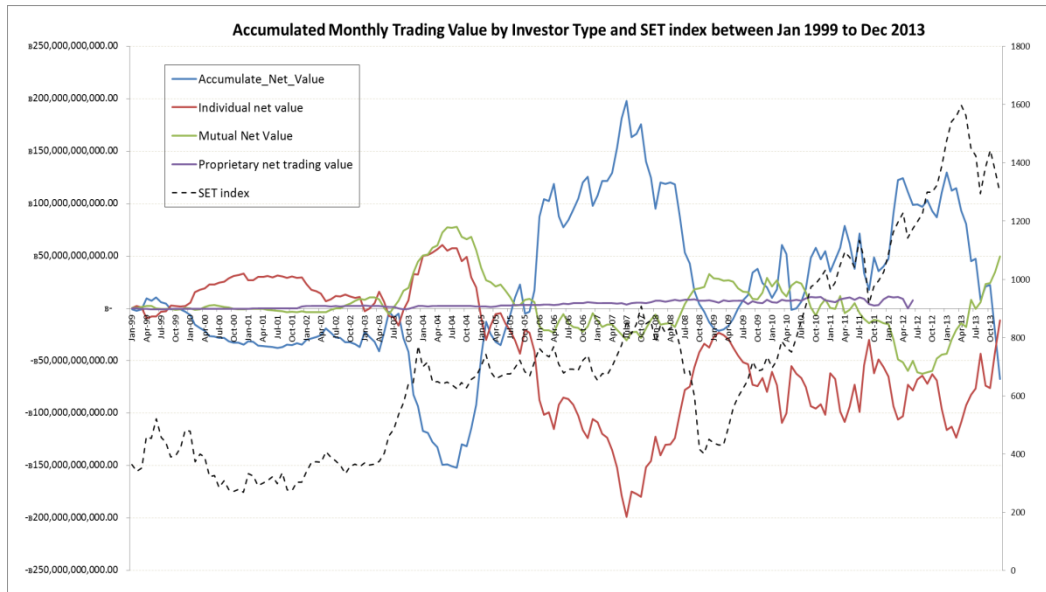


Figure 1: The aggregated net trading value of all investor types in Stock Exchange of Thailand since January 1999 to December 2013

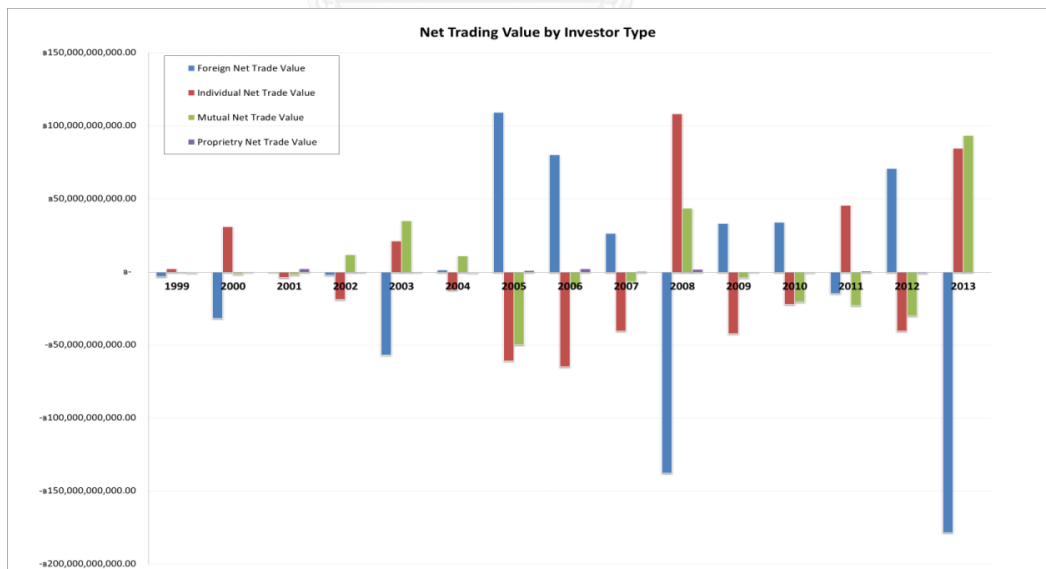


Figure 2: Net trading value of all investor types in Stock Exchange of Thailand since January 1999 to December 2013

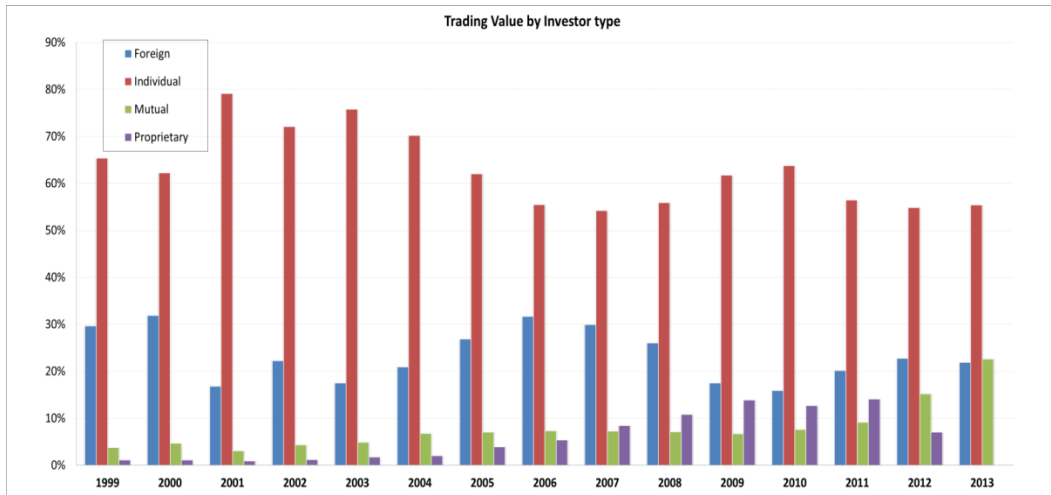


Figure 3: Percentage of all investor types' trading value in Stock Exchange of Thailand since 1999-2013

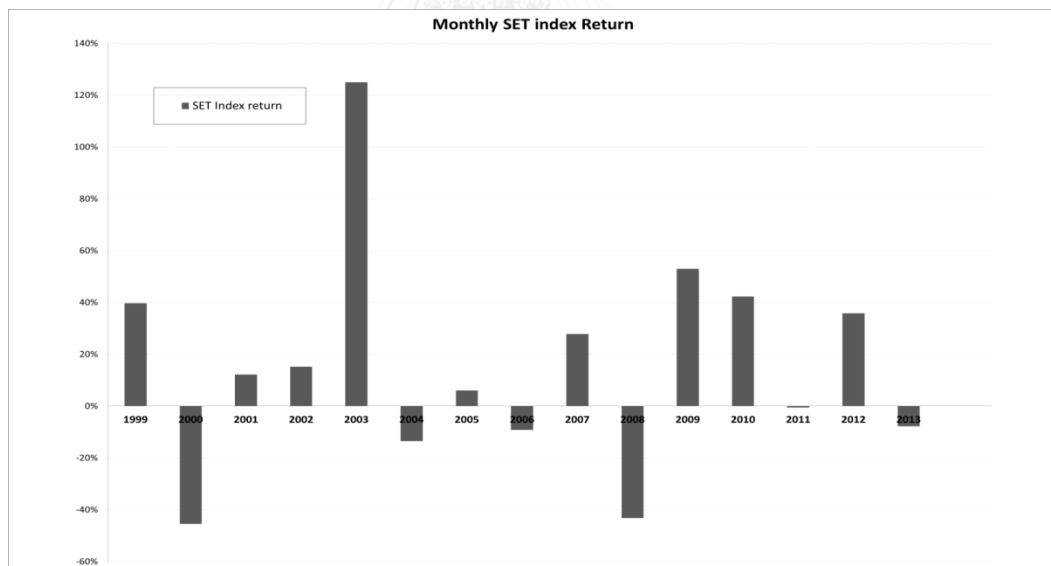


Figure 4: Return of SET index return since 1999-2013

Fig 3 presents the proportion of trading value of all type of investors during years 1999 through 2013. It indicates that individual investors are the most active investor type who account for 60% of trading value in SET. The other groups of investor account for small proportion of trading value relatively. The trading value proportion of institutional and are approximate 10%, on average. Foreign investors have inconstant trading value between 15% - 30%.

Table 1 reports the descriptive statistic of daily buying, selling and net trading value on SET from January 1999 to December 2013 which is attributed to foreign investors, institutional investors, individual investors and proprietary traders. It indicates that individual investors are the most active traders in all of four investor types. On average, they purchase 11,227 million baht and sell 11,246 million baht every day on stocks during the sample period which is the highest proportion of trading value at 61%. It also demonstrates that foreign investors rank second in trading activity, followed by institutional and proprietary traders, respectively. Foreign investors, on average, purchase 3,966 million baht and sell 3,985 million per day baht which is 22% of overall trading activities. For institutional investors, their trading activity is 10% of total trading value. They buy 1,869 million baht and sell 1,855 million baht per day. Proprietary traders have a relatively small amount of buying value and selling value at 1,258 million baht and 1,256 million baht per day which is 7% proportion. This proportion of trading activity is contrasts with more developed market, where individual investors' trading is not major.

**Table 1 Trading value of all investor types**

Reports investors type trading value in Stock Exchange of Thailand using stocks in SET index. The sample period is from January 1999 to December 2013. For each investor type, descriptive statistic of daily buy, sell and net buy sell value are reported. Daily net buy sell value is buy value minus by sell value.

	<b>Unit: Million baht</b>		
	<b>Buy</b>	<b>Sell</b>	<b>Net Buy Sell</b>
<i>Foreign</i>			
<b>Max</b>	36,586	-36	14,973
<b>Min</b>	50	-31,393	-21,126
<b>Mean</b>	3,966	-3,985	-18
<b>(%)</b>	22%	22%	
<b>Median</b>	3,303	3,326	-35
<b>SD</b>	3,142	3,127	1,613
<b>Max Buying Date</b>	30/11/2012		
<b>Min Selling Date</b>	30/11/2012		
<i>Institutional</i>			
<b>Max</b>	24,278	-8,197	8,937
<b>Min</b>	4	-23,913	-4,705
<b>Mean</b>	1,869	-1,855	13
<b>(%)</b>	10%	10%	
<b>Median</b>	952	-939	3
<b>SD</b>	2,815	2,715	848
<b>Max Buying Date</b>	19/9/2013		
<b>Min Selling Date</b>	13/6/2013		
<i>Individual</i>			
<b>Max</b>	95,925	-290	27,423
<b>Min</b>	351	-97,777	-15,569
<b>Mean</b>	11,227	-11,246	-18
<b>(%)</b>	61%	61%	
<b>Median</b>	8,388	-8,308	23
<b>SD</b>	10,477	10,581	1,789
<b>Max Buying Date</b>	4/11/2003		
<b>Min Selling Date</b>	4/11/2003		
<i>Proprietary</i>			
<b>Max</b>	12,967	-2	3,145
<b>Min</b>	1	-13,065	-2,260
<b>Mean</b>	1,258	-1,256	2
<b>(%)</b>	7%	7%	
<b>Median</b>	590	-584	-0.07
<b>SD</b>	1,622	1,602	330
<b>Max Buying Date</b>	5/11/2010		
<b>Min Selling Date</b>	4/11/2010		



**Table 2 Daily average net buy/sell value in the portfolio**

Reports the daily average net buy/sell value in the style portfolio for each investor type in the sample period. The sample period is from January 1999 to December 2013.

**Panel A: Daily Average Net Buy/Sell Value of Investors in Market Value Dimension Unit: Thousand baht**

Portfolio	Foreign	Institutional	Proprietary	Individual	
<b>Large Market Cap. Portfolio</b>	<b>Portfolio1</b>	2,920	2,441	-15	-4,808
	<b>Portfolio2</b>	12,924	-1,392	-162	-12,284
	<b>Portfolio3</b>	-7,208	-10,071	1,149	14,947
	<b>Portfolio4</b>	-15,581	15,024	1,121	-5,441
<b>Small Market Cap. Portfolio</b>	<b>Portfolio5</b>	-3,668	2,834	-814	1,674

**Panel B: Daily Average Net Buy/Sell Value of Investors in BEME Dimension Unit: Thousand baht**

Portfolio	Foreign	Institutional	Proprietary	Individual	
<b>Value Portfolio (High BEME value)</b>	<b>Portfolio1</b>	4,989	16,635	-885	-23,186
	<b>Portfolio2</b>	16,469	-5,094	-197	-16,731
	<b>Portfolio3</b>	5,928	-874	359	-6,942
	<b>Portfolio4</b>	1,277	1,015	498	-3,679
<b>Growth Portfolio (Low BEME value)</b>	<b>Portfolio5</b>	-35,265	-2,318	903	39,899

**Panel C: Daily Average Net Buy/Sell Value of Investors in Momentum Dimension Unit: Thousand baht**

Portfolio	Foreign	Institutional	Proprietary	Individual	
<b>Highest Return Portfolio</b>	<b>Portfolio1</b>	-24,796	9,254	-32	13,731
	<b>Portfolio2</b>	-10,529	11,815	-198	-2,299
	<b>Portfolio3</b>	11,551	8,755	-187	-22,903
	<b>Portfolio4</b>	-2,702	-9,211	388	1,1593
<b>Lowest Return Portfolio</b>	<b>Portfolio5</b>	9,717	-15,316	864	4,370

In table 2, the daily average net buy/sell value of all investor types in each style portfolio is reported. In panel A, the daily average net buy/sell value in market value dimension is reported. On average, foreign investors net buy large market cap style portfolio around 3 million baht per day and they net sell small market cap style portfolio around 3.5 million baht per day. Institutional investors also have net buy position on large market cap style portfolio around 2.5 million baht and they also have net buy position on small market cap style portfolio around 2.8 million baht. For individual investors, they have net sell position on big market cap style portfolio around 4.8 million. On contrary, they have net buy position on small market cap style portfolio around 1.6 million baht per day.

In panel B, Value/Growth dimension, foreign investors and institutional investors are similar. Both of them have net buy position on value style portfolio around 5 and 16 million baht and have net sell position on growth style portfolio around 35 and 2.3 million baht, in order. However, individual investors result exhibits an opposite direction. They buy growth style portfolio around 40 million baht and sell value style portfolio 23 million baht every day.

In panel C, Momentum dimension, foreign investors have net buy position on style portfolio which have lowest return in past 1 year around 10 million baht and they have net sell position on highest return in past 1 year style portfolio around 25 million baht. On the other hand, institutional investors react in opposite direction. They net buy highest return style portfolio around 9 million baht and they net sell lowest return style portfolio around 15 million baht. For Individual investors, they have net long position on highest return style portfolio around 14 million baht and they also have net long position on lowest return style portfolio around 4 million baht.

**Table 3 Number of Stocks in Portfolio**

Reports the number of stocks in the portfolio for each year and the average of all sample period. The sample period is from January 1999 to December 2013.

**Panel A: Number of Stocks in Portfolio (Market Value Dimension)**

Year	Portfolio1 (Large Market Cap. Portfolio)	Portfolio2	Portfolio3	Portfolio 4	Portfolio5 (Small Market Cap. Portfolio)
1999	1	4	8	21	321
2000	2	4	8	24	298
2001	2	5	10	25	285
2002	3	5	12	34	278
2003	2	6	11	41	293
2004	2	5	13	41	326
2005	2	4	12	38	357
2006	1	5	10	37	383
2007	1	5	12	35	397
2008	1	4	10	34	403
2009	1	4	9	32	403
2010	1	5	11	33	398
2011	2	5	9	32	395
2012	2	5	10	29	397
2013	3	6	13	40	388
<b>Average</b>	<b>2</b>	<b>5</b>	<b>11</b>	<b>34</b>	<b>355</b>

**Panel B: Number of Stocks in Portfolio (BEME Dimension)**

Year	Portfolio1 (Value Portfolio)	Portfolio2	Portfolio3	Portfolio4	Portfolio5 (Growth Portfolio)
1999	134	49	35	6	13
2000	152	44	19	4	7
2001	170	81	15	19	13
2002	190	48	23	19	27
2003	188	45	40	17	36
2004	189	80	24	24	42
2005	221	59	59	15	33
2006	259	73	44	38	10
2007	268	45	46	52	28
2008	269	73	47	25	27
2009	259	75	29	58	22
2010	262	87	32	36	24
2011	272	34	65	23	39
2012	253	71	47	36	32
2013	212	56	87	59	29
<b>Average</b>	<b>220</b>	<b>62</b>	<b>41</b>	<b>29</b>	<b>26</b>

**Panel C: Number of Stocks in Portfolio (Momentum Dimension)**

<b>Year</b>	<b>Portfolio1 (Highest Return Portfolio)</b>	<b>Portfolio2</b>	<b>Portfolio3</b>	<b>Portfolio4</b>	<b>Portfolio5 (Small Market Cap. Portfolio)</b>
<b>1999</b>	21	34	71	42	182
<b>2000</b>	64	89	98	32	44
<b>2001</b>	101	30	63	57	67
<b>2002</b>	73	65	76	41	58
<b>2003</b>	76	37	51	78	810
<b>2004</b>	25	50	20	82	168
<b>2005</b>	52	23	34	78	184
<b>2006</b>	71	24	54	51	200
<b>2007</b>	80	61	23	86	181
<b>2008</b>	66	33	49	135	154
<b>2009</b>	130	40	66	15	192
<b>2010</b>	93	99	82	50	115
<b>2011</b>	94	79	14	63	184
<b>2012</b>	51	54	125	73	133
<b>2013</b>	145	89	53	69	84
<b>Average</b>	<b>77</b>	<b>54</b>	<b>59</b>	<b>64</b>	<b>136</b>

Table 3 reports the number of stocks in every style portfolios at each year in sample and the average of all sample period in each style portfolio. In panel A, a number of stocks in market value dimension are reported. On average, large market capitalization style portfolio has 2 stocks and small market capitalization style portfolio has 355 stocks. In panel B, BEME dimension, value style portfolio has 220 stocks and growth style portfolio has 26 stocks. In panel C, momentum dimension, highest return style portfolio has 77 stocks and lowest return style portfolio has 136 stocks.

**Table 4 Beta estimator of all stocks in style portfolio**

Reports the beta estimator of all stocks in style portfolio. Beta value of each stock is estimated year by year in my sample period from equation:  
 $r_{i,t} = r_{f,t} + \beta(r_{m,t} - r_{f,t}) + u_{i,t}$ .  $r_{i,t}$  is return of stock  $i$  at day  $t$ .  $r_{m,t}$  is return of SET index  $i$  at day  $t$ .  $r_{f,t}$  is risk-free asset return at day  $t$ .

**Panel A: Beta Estimator Value in Market Value Dimension**

Portfolio		N	Mean	Median	SD	Min	Max
Large Market Cap. Portfolio	Portfolio1	26	1.23	1.28	0.73	-0.98	2.59
	Portfolio2	72	0.96	0.97	0.79	-1.96	2.65
	Portfolio3	157	1.09	1.06	0.94	-2.40	6.73
	Portfolio4	481	0.91	0.85	1.10	-4.87	6.92
Small Market Cap. Portfolio	Portfolio5	5236	0.52	0.35	1.59	-29.21	28.09

**Panel B: Beta Estimator Value in BEME Dimension**

Portfolio		N	Mean	Median	SD	Min	Max
Value Portfolio (High BEME value)	Portfolio1	3244	0.50	0.35	1.54	-28.80	28.09
	Portfolio2	909	0.66	0.45	1.95	-29.21	20.63
	Portfolio3	597	0.63	0.52	1.00	-5.23	7.30
	Portfolio4	423	0.70	0.61	0.91	-7.53	3.75
Growth Portfolio (Low BEME value)	Portfolio5	378	0.59	0.59	1.68	-17.37	7.81

**Panel C: Beta Estimator Value in Momentum Dimension**

Portfolio		N	Mean	Median	SD	Min	Max
Highest Return Portfolio	Portfolio1	1124	0.68	0.51	1.26	-5.21	19.11
	Portfolio2	797	0.56	0.38	1.71	-20.27	28.09
	Portfolio3	868	0.59	0.37	1.60	-17.37	20.63
	Portfolio4	937	0.51	0.38	1.38	-18.98	12.39
Lowest Return Portfolio	Portfolio5	1985	0.50	0.42	1.64	-29.21	19.72

Table 4 reports the beta value of all stocks in each style portfolio. Beta value is estimated year by year in all of my sample period during year 1999-2013. In panel A, beta values in market value dimension are reported. It shows that large market cap style portfolio has beta value 1.23 on average and small market cap style portfolio has beta value on average 0.52. Panel B reports the beta values in BEME dimension. It expresses that value style portfolio has average beta value at 0.5 and growth style portfolio has average beta value at 0.59. For panel C, it indicates the beta values in momentum dimension. It shows that highest return style portfolio has average beta value

## **6.2. Degree of style investing**

### **6.2.1. Market Value Style Dimension**

Table 5 reports the degree of style investing of all investor types in size style dimension. In panel A, it shows that all type of investors use style investing in size dimension. Proprietary traders' degree of style investing is strongest at t-value 12.04 for entire sample period followed by institutional investors at 8.85, Individual investors at 8.48 and the last one is foreign investors who have degree of style investing at 5.90.

In addition, degree of style investing in different market conditions is considered. All of sample period are separated into 3 periods; period 2000-2002 and period 2009-2012, SET index gives a negative return. These periods is considered as bear market. Period 2009-2012, SET index gives positive return and be considered as bull market. After identifying market condition for each period, the degree of style investing is measure. In period 2000-2002, only individual and foreign investors exhibit style trading behavior at degree of style investing 1.99 and 1.77, in order. From trading year 2004 to 2008, style-based trading is used by all types of investor significantly and

stronger than period 2000-2002. In order, proprietary traders' degree of style investing are strongest at t-value 7.41 followed by individual investors at 5.43, foreign investors at 5.20 and the last one is institutional investors who have degree of style investing at 4.84. During year 2009 to 2012, style trading behavior in market value dimension has been used by all type of investors. The interesting is proprietary and institutional investors' degree of style investing are stronger relative with past. Proprietary and institutional investors' degree of style investing grow to 12.23 and 6.56, in order. For individual investors, their degree of style investing changes to 4.55. In contrast, foreign investors' degree of style investing decreases to 1.72.

From Froot et al. (2001), the reallocation intensity may capture investors' long term preference. By using second model (see equation (5)), the long term preference of style portfolio is not considered. In panel B, the result shows reallocation intensity t-value after exclude out style portfolio preference. The trading intensity of all investor types slightly decrease compare with reallocation intensity in model 1 but all of them are statistically significant. In order, for all of entire sample periods, proprietary traders' reallocation intensities are constant at t-value 12.04. Following by individual investors and institutional investors whose reallocation intensities are equal 8.35 and 8.02, in order. Finally, the foreign investors have reallocation intensities at 5.64.

**Table 5 Degree of Style investing (Reallocation intensity) in Market Value Dimension****Panel A: Degree of Style investing (Reallocation intensity) in Market Value Dimension**

Reports Newy-West adjusted t-statistics of style reallocation intensities against the mean of randomly drawn Monte Carlo reallocation intensity sample. The sample period is from January 1999 to December 2013. For each year 10,000 random Monte Carlo samples of styles are drawn so that their market capitalization matches the actual styles. Reallocation intensity is a measure of the cross variation in excess market flows. T-statistic is calculated from the daily difference between the actual style reallocation intensity and the mean Monte Carlo reallocation intensity.

Period	T-Value			
	Foreign	Institutional	Proprietary	Individual
1999	1.79*	0.53	3.32**	2.09**
2000	-0.45	-0.56	-0.60	-1.24
2001	0.98	1.39	-0.87	2.14**
2002	2.51**	0.45	-1.13	2.50**
2003	3.78**	0.78	-0.56	3.74**
2004	4.46**	3.50**	1.08	4.26**
2005	1.82*	1.89*	0.03	1.72*
2006	1.85*	1.95*	3.05**	1.88*
2007	2.31**	-0.10	6.52**	2.43**
2008	1.29	2.92**	7.28**	2.31**
2009	0.87	2.16**	8.63**	2.35**
2010	3.14**	3.53**	4.94**	4.04**
2011	0.58	5.05**	6.77**	2.44**
2012	-0.97	2.23**	5.65**	-0.07
2013	-0.56	5.69**		2.40**
<b>All Period</b>	<b>5.90**</b>	<b>8.85**</b>	<b>12.04**</b>	<b>8.48**</b>
<b>Bear Year 2000-2002</b>	<b>1.77*</b>	<b>0.48</b>	<b>-1.43</b>	<b>1.99**</b>
<b>Bear Year 2004-2008</b>	<b>5.20**</b>	<b>4.84**</b>	<b>7.41**</b>	<b>5.43**</b>
<b>Bull Year 2009-2012</b>	<b>1.72*</b>	<b>6.56**</b>	<b>12.23**</b>	<b>4.55**</b>

**Panel B: Style Reallocation Intensities in Market Value Dimension (Exclude Style Preference)**

Reports Newy-West adjusted t-statistics of style reallocation intensities against the mean of randomly drawn Monte Carlo reallocation intensity sample. The sample period is from January 1999 to December 2013. For each year 10,000 random Monte Carlo samples of styles are drawn so that their market capitalization matches the actual styles. Reallocation intensity is a measure of the cross variation in excess market flows. T-statistic is calculated from the daily difference between the actual style reallocation intensity and the mean Monte Carlo reallocation intensity.

Period	T-Value			
	Foreign	Institutional	Proprietary	Individual
1999	1.57	0.64	3.39**	2.21**
2000	-0.60	-0.54	-0.62	-1.10
2001	1.04	1.38	-0.77	2.63**
2002	2.75**	0.31	-1.45	2.41**
2003	4.08**	0.60	-0.63	4.11**
2004	4.76**	2.39**	1.07	4.21**
2005	2.02**	2.10**	0.03	1.87*
2006	2.11**	1.86*	2.97**	1.80*
2007	2.47**	-0.27	6.47**	2.64**
2008	0.11	2.91**	7.27**	1.76*
2009	0.62	2.03**	8.67**	2.31**
2010	2.62**	3.59**	4.95**	3.81**
2011	0.56	4.56**	6.78**	2.26**
2012	-1.19	1.01	5.67**	-0.32
2013	-0.40	5.49**		2.35**
<b>All Period</b>	<b>5.64**</b>	<b>8.02**</b>	<b>12.04**</b>	<b>8.35**</b>
<b>Bear Year 2000-2002</b>	<b>1.84**</b>	<b>0.44</b>	<b>-1.60</b>	<b>2.24**</b>
<b>Bear Year 2004-2008</b>	<b>5.00**</b>	<b>4.20**</b>	<b>7.37**</b>	<b>5.20**</b>
<b>Bull Year 2009-2012</b>	<b>1.36</b>	<b>5.88**</b>	<b>12.27**</b>	<b>4.25**</b>



### 6.2.2. Momentum Style Dimension

Table 6 reports the degree of style investing in momentum dimension. Panel A indicates that style investing in momentum dimension is used by all type of investors but it is weaker than style investing in size dimension. In order, institutional investors exhibit the strongest style-based trading in momentum dimension by t-value 7.59 over entire sample period followed by individual investors at 6.05, proprietary traders at 3.43 and the last one is foreign investors who have reallocation intensity at 3.32.

During period 2000-2002, style-based trading is used by only institution investors. Their degree of style investing has a highest value at 2.32. After that period during 2004-2008, style investing is used by all type of investors and the degree of style investing highly improves. Institutional investors also have highest degree of style investing at 5.26, individual investors at 4.31, foreign investors at 3.36 and proprietary at 2.86.

Panel B reports the degree of style investing in momentum dimension after investors' style portfolio preference are excluded out. It also shows that style-based trading in momentum dimension is also statistically significant after extracted long term investors' style portfolio preference out. All investors' degree of style investing slightly decrease. However, all of them are statistically significant.

**Table 6 Degree of Style investing (Reallocation intensity) in Momentum Dimension****Panel A: Degree of Style investing (Reallocation intensity) in Momentum Dimension**

Reports Newy-West adjusted t-statistics of style reallocation intensities against the mean of randomly drawn Monte Carlo reallocation intensity sample. The sample period is from January 1999 to December 2013. For each year 10,000 random Monte Carlo samples of styles are drawn so that their market capitalization matches the actual styles. Reallocation intensity is a measure of the cross variation in excess market flows. T-statistic is calculated from the daily difference between the actual style reallocation intensity and the mean Monte Carlo reallocation intensity.

Period	T-Value			
	Foreign	Institutional	Proprietary	Individual
1999	1.45	2.17**	2.84**	2.43**
2000	-0.65	-1.60	-1.63	0.04
2001	1.01	1.56	2.64**	-0.31
2002	1.99**	5.13**	1.49	2.84**
2003	-0.36	0.71	1.31	0.40
2004	2.15**	0.96	1.89*	2.49**
2005	-0.19	1.04	0.46	-0.21
2006	-1.47	1.07	-1.36	-0.99
2007	1.96*	1.85*	1.96*	2.17**
2008	6.13**	7.48**	2.70**	6.44**
2009	-0.27	1.15	1.38	1.08
2010	1.48	1.12	-0.01	0.46
2011	0.18	-1.02	1.53	0.58
2012	1.78*	4.39**	-1.91*	4.74**
2013	-0.89	5.96**		3.04**
<b>All Period</b>	<b>3.32**</b>	<b>7.59**</b>	<b>3.43**</b>	<b>6.05**</b>
<b>Bear Year 2000-2002</b>	<b>1.15</b>	<b>2.32**</b>	<b>1.63</b>	<b>1.42</b>
<b>Bear Year 2004-2008</b>	<b>3.36**</b>	<b>5.26**</b>	<b>2.86**</b>	<b>4.31**</b>
<b>Bull Year 2009-2012</b>	<b>1.27</b>	<b>2.13**</b>	<b>1.25</b>	<b>2.93**</b>

**Panel B: Degree of Style investing (Reallocation intensity) in Momentum Dimension (Exclude Style Preference)**

Reports Newy-West adjusted t-statistics of style reallocation intensities against the mean of randomly drawn Monte Carlo reallocation intensity sample. The sample period is from January 1999 to December 2013. For each year 10,000 random Monte Carlo samples of styles are drawn so that their market capitalization matches the actual styles. Reallocation intensity is a measure of the cross variation in excess market flows. T-statistic is calculated from the daily difference between the actual style reallocation intensity and the mean Monte Carlo reallocation intensity.

Period	T-Value			
	Foreign	Institutional	Proprietary	Individual
1999	1.41	2.08**	2.96**	2.29**
2000	-0.32	-1.97**	-1.56	0.39
2001	0.98	1.51	2.95**	-0.60
2002	1.73*	4.04**	1.58	2.60**
2003	-0.38	0.45	1.17	0.23
2004	1.89*	0.98	1.82*	2.47**
2005	-0.01	0.93	0.41	-0.07
2006	-1.40	1.10	-1.37	-0.92
2007	2.18**	1.94**	1.98**	2.31**
2008	6.49**	7.82**	2.65**	6.71**
2009	-0.45	0.81	1.40	1.10
2010	1.60	0.54	0.01	0.67
2011	0.41	-1.19	1.54	0.73
2012	1.45	6.07**	-1.94**	3.94**
2013	-1.07	8.27**		3.05**
<b>All Period</b>	<b>3.27**</b>	<b>7.04**</b>	<b>3.47**</b>	<b>5.96**</b>
<b>Bear Year 2000-2002</b>	<b>1.15</b>	<b>1.52</b>	<b>1.87*</b>	<b>1.32</b>
<b>Bear Year 2004-2008</b>	<b>3.47**</b>	<b>5.39**</b>	<b>2.81**</b>	<b>4.48**</b>
<b>Bull Year 2009-2012</b>	<b>1.15</b>	<b>1.62*</b>	<b>1.27</b>	<b>2.80**</b>

### 6.2.3. BEME Style Dimension

Table 7 reports the degree of style investing in BEME dimension. Panel A indicates an interesting result that all type of investors don't use style investing in value/growth dimension. The degree of style investing of all investor types except proprietary traders are not statistically significant from 0. In addition, proprietary traders' degree of style investing for all entire sample period is -2.11 and statistically significant. This expresses that proprietary traders randomly choose stocks more than invest in style when they consider book-to-market equity value.

Similarly with other style dimensions, different market conditions are tested. The result indicates that both 2000-2002 and 2004-2008 periods, all of investors' degree of style investing are not different from 0. However, during 2009-2012, proprietary traders choose stocks randomly rather than use style investing.

After investors' long term style portfolio preference are excluded out. Panel B reports result that all of investors' degree of style investing decrease and not statistically significant from 0 except proprietary traders whose reallocation intensity equals -2.15 and statistically significant.

**Table 7 Degree of Style investing (Reallocation intensity) in BEME Dimension****Panel A: Degree of Style investing (Reallocation intensity) in BEME Dimension**

Reports Newy-West adjusted t-statistics of style reallocation intensities against the mean of randomly drawn Monte Carlo reallocation intensity sample. The sample period is from January 1999 to December 2013. For each year 10,000 random Monte Carlo samples of styles are drawn so that their market capitalization matches the actual styles. Reallocation intensity is a measure of the cross variation in excess market flows. T-statistic is calculated from the daily difference between the actual style reallocation intensity and the mean Monte Carlo reallocation intensity.

Period	T-Value			
	Foreign	Institutional	Proprietary	Individual
1999	2.96**	0.90	1.49	2.76**
2000	1.79*	-0.41	-1.45	2.59**
2001	-2.05**	0.47	-0.43	-1.00
2002	-0.13	1.55	1.00	0.56
2003	-1.54	0.35	-0.78	-0.41
2004	-0.56	-0.61	-2.68**	-0.86
2005	0.03	-0.15	1.56	-0.13
2006	0.46	-1.31	0.78	1.23
2007	1.04	0.67	0.77	0.89
2008	-2.68**	-1.25	-0.13	-1.34
2009	-0.80	-1.30	-1.89*	-0.86
2010	1.27	-0.36	-2.54**	-0.32
2011	0.04	-0.78	-1.10	-0.20
2012	2.36**	2.64**	0.78	3.61**
2013	0.67	0.80		1.01
<b>All Period</b>	<b>0.87</b>	<b>0.25</b>	<b>-2.11**</b>	<b>1.52</b>
<b>Bear Year 2000-2002</b>	<b>0.07</b>	<b>0.64</b>	<b>-0.46</b>	<b>1.03</b>
<b>Bear Year 2004-2008</b>	<b>-0.53</b>	<b>-1.13</b>	<b>0.03</b>	<b>-0.10</b>
<b>Bull Year 2009-2012</b>	<b>1.02</b>	<b>0.25</b>	<b>-2.72**</b>	<b>0.52</b>

**Panel B: Degree of Style investing (Reallocation intensity) in BEME Dimension (Exclude Style Preference)**

Reports Newy-West adjusted t-statistics of style reallocation intensities against the mean of randomly drawn Monte Carlo reallocation intensity sample. The sample period is from January 1999 to December 2013. For each year 10,000 random Monte Carlo samples of styles are drawn so that their market capitalization matches the actual styles. Reallocation intensity is a measure of the cross variation in excess market flow. T-statistic is calculated from the daily difference between the actual style reallocation intensity and the mean Monte Carlo reallocation intensity.

Period	T-Value			
	Foreign	Institutional	Proprietary	Individual
1999	3.02**	0.99	1.60	2.88**
2000	1.70*	-0.43	-1.41	2.61**
2001	-1.93*	0.25	-0.84	-1.61
2002	0.29	1.23	0.83	0.26
2003	-1.49	0.29	-0.61	-0.38
2004	-0.46	-0.36	-2.67	-0.79
2005	0.15	-0.15	1.61	-0.09
2006	0.05	-1.35	0.76	0.82
2007	1.01	0.77	0.77	0.80
2008	-3.20**	-1.42	-0.10	-1.93*
2009	-0.75	0.09	-1.89	-0.80
2010	0.96	-1.31	-2.54	-0.29
2011	0	-0.50	-1.18	-0.08
2012	2.58**	2.70**	0.78	3.73**
2013	0.78	0.78		1.38
<b>All Period</b>	<b>0.81</b>	<b>0.04</b>	<b>-2.15**</b>	<b>1.33</b>
<b>Bear Year 2000-2002</b>	<b>0.34</b>	<b>0.36</b>	<b>-0.72</b>	<b>0.59</b>
<b>Bear Year 2004-2008</b>	<b>-0.80</b>	<b>-1.00</b>	<b>0.04</b>	<b>-0.45</b>
<b>Bull Year 2009-2012</b>	<b>0.94</b>	<b>0.01</b>	<b>-2.76**</b>	<b>0.62</b>

### 6.3. Style Preference

#### 6.3.1. Size Style Preference

Size style portfolio preference of all of investor types are reported in Table 8. From panel A, by using weight of style portfolio in market as benchmark, result indicates that foreign investors do not prefer to invest in both large and small style portfolios. They choose to underweight large and small size style portfolio on average, 23% and 49% compare with benchmark, respectively. However, foreign investors prefer to invest in medium size style portfolio by overweight portfolio 3 18%, on average.

For institutional investors, they prefer to invest in large market cap style portfolio by overweighting at 61%. Proprietary traders do not prefer to invest in both large and small size style portfolios. They choose to underweight large and small size style portfolios on average, at 42% and 353%, respectively. In addition, they choose to overweight medium size style portfolio by overweight them at 350%. Individual investors are the only one who prefer to invest in small size style portfolio by overweighting small size style portfolio 65%.

In addition, Monte Carlo randomly portfolio expected position are employed as a benchmark; result is reported in panel B. It shows similar result as previous. Foreign investors do not prefer to invest in both large and small size style portfolios while they prefer to invest in medium size style portfolio. Their positions on large, small and medium style portfolio are -11%, -35% and 34% compare with benchmark. For institutional investors, their position in large style portfolio change to 74% compare with benchmark. Individual investors' small style portfolio position is higher to 80%. For proprietary traders who prefer to trade a medium size style portfolio, their average

position on large size style portfolio is slightly higher to -29% and small size style portfolio are higher to -336%. For medium size style portfolio, their average position are higher to 367%.

**Table 8 Style Preferences of Investors in Market Value Dimension**

**Panel A: Style Preferences of Investors in Market Value Dimension (Market Weight Benchmark)**

Reports the average excess style position in the aggregate portfolio for each investor type in the sample. The sample period is from January 1999 to December 2013. The excess style portfolio  $k$  position at day  $t$  is the difference between the actual and the expected positions in style portfolio  $k$  at day  $t$ . Here, the expected position is the weight assigned to style portfolio  $k$  in the aggregate market portfolio.

Portfolio		Foreign	Institutional	Proprietary	Individual
Large Market Cap. Portfolio	Portfolio1	<b>-0.2397</b>	<b>0.6194</b>	<b>-0.4224</b>	<b>-0.1478</b>
	<i>T-Value</i>	-9.96**	7.23**	-11.42**	-6.50**
	Portfolio2	<b>-0.0308</b>	<b>0.4677</b>	<b>-2.5168</b>	<b>-0.7746</b>
	<i>T-Value</i>	-1.09	5.72**	-21.74**	-14.17**
Small Market Cap. Portfolio	Portfolio3	<b>0.1842</b>	<b>-0.7645</b>	<b>3.5019</b>	<b>-0.3589</b>
	<i>T-Value</i>	5.85**	-14.57**	21.69**	-8.47**
	Portfolio4	<b>-0.2189</b>	<b>1.5068</b>	<b>1.5130</b>	<b>-0.6317</b>
	<i>T-Value</i>	-7.84**	15.79**	13.48**	-16.27**
Small Market Cap. Portfolio	Portfolio5	<b>-0.4998</b>	<b>-2.5954</b>	<b>-3.5308</b>	<b>0.6565</b>
	<i>T-Value</i>	-14.06**	-22.80**	-23.13**	10.80**

**Panel B: Style Preferences of Investors in Market Value Dimension (Monte Carlo Benchmark)**

Reports the average excess style position in the aggregate portfolio for each investor type in the sample. The sample period is from January 1999 to December 2013. The excess style portfolio  $k$  position at day  $t$  is the difference between the actual and the expected positions in style portfolio  $k$  at day  $t$ . Here, the expected position is the average of 10,000 random actual style portfolio position values at day  $t$ .

Portfolio		Foreign	Institutional	Proprietary	Individual
Large Market Cap. Portfolio	Portfolio1	<b>-0.1178</b>	<b>0.7418</b>	<b>-0.2930</b>	<b>-0.0259</b>
	<i>T-Value</i>	-4.83**	8.80**	-8.02**	-1.09
	Portfolio2	<b>0.1519</b>	<b>0.6507</b>	<b>-2.318</b>	<b>-0.5920</b>
	<i>T-Value</i>	5.52**	8.00**	-20.28**	-10.87**
Small Market Cap. Portfolio	Portfolio3	<b>0.3443</b>	<b>-0.6045</b>	<b>3.6763</b>	<b>-0.1988</b>
	<i>T-Value</i>	11.01**	-11.33**	22.57**	-4.59**
	Portfolio4	<b>-0.0609</b>	<b>1.6649</b>	<b>1.6865</b>	<b>-0.4736</b>
	<i>T-Value</i>	-2.15**	17.42**	14.87**	-12.16**
Small Market Cap. Portfolio	Portfolio5	<b>-0.3535</b>	<b>-2.4484</b>	<b>-3.3671</b>	<b>0.8026</b>
	<i>T-Value</i>	-10.09**	-21.33**	-22.32**	12.93**

### 6.3.2. Momentum Style Preference

Momentum style portfolio preference of all of investor types are reported in Table 8. Using market weight as benchmark, panel A indicates that foreign investors' prefer contrarian trading strategy. On average, they overweight style portfolio which have lowest past one year return 7% compare with benchmark. On contrary, institutional investors exhibit a strong positive feed-back trading behavior by overweighting highest past one year return style portfolio at 311%. For both proprietary and individual investors, they exhibit a contrarian trading behavior. They overweight lowest past one year return style portfolio by 234% and 76%, respectively.

In addition, after changing benchmark to Monte Carlo randomly portfolio expected position, shown in panel B. The result is consistence with previous result. Foreign investors overweight lowest return style portfolio 23%. Institutional investors are the only one type of investor who employ strong momentum trading strategy. They overweight highest past one year return style portfolio at 77%.

Proprietary traders and individual investors, their behaviors are consistence with previous. They exhibit contrarian trading behavior. They overweight lowest return portfolio at 252% and 93%, respectively.

**Table 9 Style Preferences of Investors in Momentum Dimension****Panel A: Style Preferences of Investors in Momentum Dimension (Market Weight Benchmark)**

Reports the average excess style position in the aggregate portfolio for each investor type in the sample. The sample period is from January 1999 to December 2013. The excess style portfolio  $k$  position at day  $t$  is the difference between the actual and the expected positions in style portfolio  $k$  at day  $t$ . Here, the expected position is the weight assigned to style portfolio  $k$  in the aggregate market portfolio.

Portfolio		Foreign	Mutual	Proprietary	Individual
<b>Highest Return Portfolio</b>	<b>Portfolio1</b>	<b>-1.1718</b>	<b>3.1140</b>	<b>-2.1970</b>	<b>-0.2556</b>
	<i>T-Value</i>	<i>-19.70**</i>	<i>26.18**</i>	<i>-21.27**</i>	<i>-5.80**</i>
	<b>Portfolio2</b>	<b>0.0284</b>	<b>2.4880</b>	<b>0.6060</b>	<b>-0.8191</b>
	<i>T-Value</i>	<i>0.75</i>	<i>22.54**</i>	<i>6.95**</i>	<i>-16.09**</i>
	<b>Portfolio3</b>	<b>-0.5421</b>	<b>-0.2979</b>	<b>0.1838</b>	<b>-0.4553</b>
	<i>T-Value</i>	<i>-10.77**</i>	<i>-5.14**</i>	<i>2.02**</i>	<i>-10.19**</i>
	<b>Portfolio4</b>	<b>0.7505</b>	<b>-1.8841</b>	<b>-2.092</b>	<b>-0.5080</b>
	<i>T-Value</i>	<i>11.82**</i>	<i>-22.32**</i>	<i>-21.45**</i>	<i>-12.38**</i>
<b>Lowest Return Portfolio</b>	<b>Portfolio5</b>	<b>0.0755</b>	<b>-4.5575</b>	<b>2.3417</b>	<b>0.7677</b>
	<i>T-Value</i>	<i>1.87*</i>	<i>-32.75**</i>	<i>20.62**</i>	<i>13.08**</i>

**Panel B: Style Preferences of Investors in Momentum Dimension (Monte Carlo Benchmark)**

Reports the average excess style position in the aggregate portfolio for each investor type in the sample. The sample period is from January 1999 to December 2013. The excess style portfolio  $k$  position at day  $t$  is the difference between the actual and the expected positions in style portfolio  $k$  at day  $t$ . Here, the expected position is the average of 10,000 random actual style portfolio position values at day  $t$ .

Portfolio		Foreign	Mutual	Proprietary	Individual
<b>Highest Return Portfolio</b>	<b>Portfolio1</b>	<b>-1.0271</b>	<b>3.2586</b>	<b>-2.043</b>	<b>-0.1112</b>
	<i>T-Value</i>	<i>-16.96**</i>	<i>27.41**</i>	<i>-19.90**</i>	<i>-2.50**</i>
	<b>Portfolio2</b>	<b>0.1622</b>	<b>2.6226</b>	<b>0.7533</b>	<b>-0.6853</b>
	<i>T-Value</i>	<i>4.25**</i>	<i>23.83**</i>	<i>8.45**</i>	<i>-13.33**</i>
	<b>Portfolio3</b>	<b>-0.3884</b>	<b>-0.1443</b>	<b>0.3533</b>	<b>-0.3018</b>
	<i>T-Value</i>	<i>-7.74**</i>	<i>-2.47**</i>	<i>3.82**</i>	<i>-6.66**</i>
	<b>Portfolio4</b>	<b>0.9248</b>	<b>-1.7097</b>	<b>-1.9023</b>	<b>-0.3339</b>
	<i>T-Value</i>	<i>14.79**</i>	<i>-20.04**</i>	<i>-19.85**</i>	<i>-7.99**</i>
<b>Lowest Return Portfolio</b>	<b>Portfolio5</b>	<b>0.2394</b>	<b>-4.3935</b>	<b>2.5237</b>	<b>0.9316</b>
	<i>T-Value</i>	<i>6.08**</i>	<i>-31.49**</i>	<i>22.26**</i>	<i>15.69**</i>



### 6.3.3. BEME Style Preference

BEME style portfolio preference of all of investor types are reported in Table 10. Using market weight as benchmark, panel A indicates that foreign and institutional investors prefer to invest in value style portfolio. They choose to overweight value style portfolio on average 11% and 72% compare with benchmark. On contrary, proprietary traders prefer to invest in growth style portfolio. They overweight growth style portfolio 37%. For individual investors, the result is not clarify as they underweight both value and growth style portfolios at 55% and 2%, in order, compare with benchmark.

After changing benchmark to Monte Carlo randomly portfolio expected position, represented in panel B. The result indicates a consistence result as previous. Foreign investor chooses to overweight value style portfolio higher to 26%. Institutional investors exhibit same behavior as previous by overweighting value stocks at 88%. Proprietary traders' preference are consistence with previous result. They overweight growth style portfolio 55%.

The result is more clarify for individual investors' preference. Their position in growth style portfolio is positive and statistically significant at 14% compare with benchmark.

**Table 10 Style Preferences of Investors in BEME Dimension****Panel A: Style Preferences of Investors in BEME Dimension (Market Weight Benchmark)**

Reports the average excess style position in the aggregate portfolio for each investor type in the sample. The sample period is from January 1999 to December 2013. The excess style portfolio  $k$  position at day  $t$  is the difference between the actual and the expected positions in style portfolio  $k$  at day  $t$ . Here, the expected position is the weight assigned to style portfolio  $k$  in the aggregate market portfolio.

Portfolio		Foreign	Mutual	Proprietary	Individual
<b>Value Portfolio (High BEME value)</b>	<b>Portfolio1</b>	<b>0.1159</b>	<b>0.7285</b>	<b>-2.9200</b>	<b>-0.5559</b>
	<i>T-Value</i>	8.43**	11.11**	-24.82**	-19.02**
	<b>Portfolio2</b>	<b>-0.1443</b>	<b>0.6025</b>	<b>-1.8450</b>	<b>-0.3080</b>
	<i>T-Value</i>	-3.47**	8.63**	-22.01**	-9.51**
	<b>Portfolio3</b>	<b>-0.1441</b>	<b>-0.1281</b>	<b>2.870</b>	<b>-0.6593</b>
	<i>T-Value</i>	-5.93**	-2.24**	23.22**	-11.57**
	<b>Portfolio4</b>	<b>-0.2203</b>	<b>-0.5183</b>	<b>0.8794</b>	<b>0.2345</b>
	<i>T-Value</i>	-10.57**	-7.23**	11.57**	4.48**
<b>Growth Portfolio (Low BEME value)</b>	<b>Portfolio5</b>	<b>-0.3478</b>	<b>-1.615</b>	<b>0.3739</b>	<b>-0.0223</b>
	<i>T-Value</i>	-6.00**	-24.12**	6.46**	-0.94

**Panel B: Style Preferences of Investors in BEME Dimension (Monte Carlo Benchmark)**

Reports the average excess style position in the aggregate portfolio for each investor type in the sample. The sample period is from January 1999 to December 2013. The excess style portfolio  $k$  position at day  $t$  is the difference between the actual and the expected positions in style portfolio  $k$  at day  $t$ . Here, the expected position is the average of 10,000 random actual style portfolio position values at day  $t$ .

Portfolio		Foreign	Mutual	Proprietary	Individual
<b>Value Portfolio (High BEME value)</b>	<b>Portfolio1</b>	<b>0.2692</b>	<b>0.8818</b>	<b>-2.7580</b>	<b>-0.4027</b>
	<i>T-Value</i>	22.17**	13.71**	-23.34**	-13.13**
	<b>Portfolio2</b>	<b>0.0067</b>	<b>0.7539</b>	<b>-1.6756</b>	<b>-0.1566</b>
	<i>T-Value</i>	0.16	10.58**	-19.85**	-4.55**
	<b>Portfolio3</b>	<b>-0.0140</b>	<b>0.0020</b>	<b>3.0108</b>	<b>-0.5294</b>
	<i>T-Value</i>	-0.57	0.03	24.33**	-9.39**
	<b>Portfolio4</b>	<b>-0.0509</b>	<b>-0.3488</b>	<b>1.0697</b>	<b>0.4037</b>
	<i>T-Value</i>	-2.52**	-4.75**	14.24**	7.52**
<b>Growth Portfolio (Low BEME value)</b>	<b>Portfolio5</b>	<b>-0.1829</b>	<b>-1.4507</b>	<b>0.5587</b>	<b>0.1425</b>
	<i>T-Value</i>	-3.13**	-21.69**	9.74**	6.20**

## **7. Robustness**

Previous result shows that style is an importance factor for all type of investor decision and every type of investors have their own style preference. In this section, some methodology are changed to clarify the previous result. In each style dimension, a number of style portfolios are changed from 5 to 3 portfolios.

### **7.1. Style Reallocation Intensity**

#### **7.1.1. Market Value Style Dimension**

Table 11 shows the degree of style investing in size dimension after a number of portfolios are reduced. In panel A, proprietary traders' degree of style investing are strongest at t-value 10.97 over entire sample period followed by institutional investors at 10.45, Individual investors at 8.70 and the last one is foreign investors who have degree of style investing at 5.10.

After exclude investors' style portfolio preference out, the degree of style investing is reported in panel B. The degree of style investing of all investor types are significant but they slightly decrease. In order, for all of entire sample periods, proprietary traders' degree of style investing is 11.00. Following by institutional investors whose degree of style investing is equal 9.95 and individual investors at 8.12. Finally, the foreign investors who have degree of style investing at 6.18.

**Table 11 Robustness Degree of Style investing (Reallocation intensity) in Market Value Dimension****Panel A: Degree of Style investing (Reallocation intensity) in Market Value Dimension**

Reports Newy-West adjusted t-statistics of style reallocation intensities against the mean of randomly drawn Monte Carlo reallocation intensity sample. The sample period is from January 1999 to December 2013. For each year 10,000 random Monte Carlo samples of styles are drawn so that their market capitalization matches the actual styles. Reallocation intensity is a measure of the cross variation in excess market flows. T-statistic is calculated from the daily difference between the actual style reallocation intensity and the mean Monte Carlo reallocation intensity.

Period	T-Value			
	Foreign	Institutional	Proprietary	Individual
1999	0.48	-2.30**	-1.08	-0.71
2000	-2.21**	-1.56	-2.78**	-1.30
2001	-1.78*	-1.83*	-1.80*	-2.20**
2002	-0.84	-0.73	-1.94*	-0.93
2003	0.48	0.27	-1.26	0.40
2004	1.78*	4.33**	-0.47	2.58**
2005	2.45**	1.66	-1.18	2.36**
2006	3.08**	3.85**	2.76**	3.24**
2007	3.22**	2.18**	5.99**	3.80**
2008	1.83*	5.73**	6.36**	4.42**
2009	3.00**	4.62**	8.76**	4.57**
2010	2.72**	5.13**	5.52**	4.92**
2011	1.18	4.49**	6.23**	4.53**
2012	2.05**	3.73**	5.33**	3.10**
2013	-0.31	5.14**		1.48
<b>All Period</b>	<b>5.10**</b>	<b>10.45**</b>	<b>10.97**</b>	<b>8.70**</b>
<b>Bear Year 2000-2002</b>	<b>-2.62**</b>	<b>-2.38**</b>	<b>-3.80**</b>	<b>-2.56**</b>
<b>Bear Year 2004-2008</b>	<b>5.38**</b>	<b>7.92**</b>	<b>6.74**</b>	<b>7.17**</b>
<b>Bull Year 2009-2012</b>	<b>4.22**</b>	<b>8.76**</b>	<b>12.12**</b>	<b>8.56**</b>

**Panel B: Style Reallocation Intensities in Market Value Dimension (Exclude Style Preference)**

Reports Newy-West adjusted t-statistics of style reallocation intensities against the mean of randomly drawn Monte Carlo reallocation intensity sample. The sample period is from January 1999 to December 2013. For each year 10,000 random Monte Carlo samples of styles are drawn so that their market capitalization matches the actual styles. Reallocation intensity is a measure of the cross variation in excess market flows. T-statistic is calculated from the daily difference between the actual style reallocation intensity and the mean Monte Carlo reallocation intensity.

Period	T-Value			
	Foreign	Institutional	Proprietary	Individual
1999	0.44	-2.48**	-1.24	-0.81
2000	-2.77**	-2.44**	-2.75**	-1.85*
2001	-1.84*	-1.84*	-1.55	-2.22**
2002	-1.49	-1.50	-1.81*	-1.51
2003	0.39	0.25	-0.97	0.30
2004	1.78*	4.32**	-0.48	2.62**
2005	2.32**	1.32	-1.28	2.20**
2006	2.98**	3.62**	2.74**	3.15**
2007	2.97**	3.62**	5.96**	3.65**
2008	1.33	5.65**	6.35**	4.06**
2009	3.13**	4.50**	8.75**	4.60**
2010	2.59**	5.26**	5.50**	4.87**
2011	0.98	4.48**	6.19**	4.41**
2012	1.78*	3.54**	5.33**	2.76**
2013	-0.57	4.99**		1.26
<b>All Period</b>	<b>4.45**</b>	<b>9.95**</b>	<b>11.00**</b>	<b>8.12**</b>
<b>Bear Year 2000-2002</b>	<b>-3.45**</b>	<b>-3.33**</b>	<b>-3.59**</b>	<b>-3.21**</b>
<b>Bear Year 2004-2008</b>	<b>5.00**</b>	<b>7.64**</b>	<b>6.71**</b>	<b>6.89**</b>
<b>Bull Year 2009-2012</b>	<b>3.99**</b>	<b>8.74**</b>	<b>12.08**</b>	<b>8.38**</b>

### 7.1.2. Momentum Style Dimension

Table 11 reports robustness result in momentum dimension. Panel A indicates that style investing in momentum dimension is used by all type of investors. However, the all of investor types' degree of style investing are weaker relative with size style dimension. In order, institutional investors have highest degree of style investing in momentum dimension at t-value 9.64 over entire sample period followed by individual investors at 7.53, foreign investors at 4.71 and the last one is proprietary traders who have degree of style investing at 3.19.

Panel B reports the style investing in momentum dimension after investors' style portfolio preference are excluded out. It shows that momentum style-based trading is also statistically significant. The trading intensity of all investor types slightly decrease. However, all of them are statistically significant. Institutional have highest degree of style investing in momentum dimension at t-value 9.55. Following by individual investors at 7.23, foreign investors at 4.06 and proprietary traders at 3.23.

**Table 12 Robustness Degree of Style investing (Reallocation intensity) in Momentum Dimension****Panel A: Degree of Style investing (Reallocation intensity) in Momentum Dimension**

Reports Newy-West adjusted t-statistics of style reallocation intensities against the mean of randomly drawn Monte Carlo reallocation intensity sample. The sample period is from January 1999 to December 2013. For each year 10,000 random Monte Carlo samples of styles are drawn so that their market capitalization matches the actual styles. Reallocation intensity is a measure of the cross variation in excess market flows. T-statistic is calculated from the daily difference between the actual style reallocation intensity and the mean Monte Carlo reallocation intensity.

Period	T-Value			
	Foreign	Institutional	Proprietary	Individual
1999	-0.05	1.13	2.38**	-0.16
2000	0.42	-0.33	-1.45	1.34
2001	-2.61**	-1.96*	-0.70	-4.74**
2002	4.00**	4.35**	2.46**	4.84**
2003	1.31	1.12	0.67	1.33
2004	1.71*	3.98**	2.83**	2.82**
2005	1.95**	3.34**	1.82*	3.35**
2006	-2.86**	0.08	-1.81*	-1.82*
2007	1.81*	2.18**	-1.38	1.86*
2008	5.90**	6.07**	4.70**	6.72**
2009	1.62	3.66**	0.34	3.36**
2010	2.26**	2.90**	0.53	3.29**
2011	0.03	0.08	1.91*	0.31
2012	2.22**	3.78**	-0.57	4.04**
2013	0.99	6.20**		3.57**
<b>All Period</b>	<b>4.71**</b>	<b>9.64**</b>	<b>3.19**</b>	<b>7.53**</b>
<b>Bear Year 2000-2002</b>	<b>1.17</b>	<b>1.27</b>	<b>-0.03</b>	<b>1.02</b>
<b>Bear Year 2004-2008</b>	<b>3.59**</b>	<b>6.91**</b>	<b>3.09**</b>	<b>5.52**</b>
<b>Bull Year 2009-2012</b>	<b>2.65**</b>	<b>5.01**</b>	<b>1.22</b>	<b>5.06**</b>

**Panel B: Degree of Style investing (Reallocation intensity) in Momentum Dimension (Exclude Style Preference)**

Reports Newy-West adjusted t-statistics of style reallocation intensities against the mean of randomly drawn Monte Carlo reallocation intensity sample. The sample period is from January 1999 to December 2013. For each year 10,000 random Monte Carlo samples of styles are drawn so that their market capitalization matches the actual styles. Reallocation intensity is a measure of the cross variation in excess market flows. T-statistic is calculated from the daily difference between the actual style reallocation intensity and the mean Monte Carlo reallocation intensity.

Period	T-Value			
	Foreign	Institutional	Proprietary	Individual
1999	-0.49	0.49	2.22**	-0.30
2000	0.12	0.19	-1.46	1.20
2001	-3.10**	-2.70**	-0.39	-4.24**
2002	3.82**	5.71**	2.41**	4.94**
2003	1.20	1.58	0.97	1.35
2004	1.77*	4.10**	2.78**	2.61**
2005	1.88*	2.74**	1.84*	3.08**
2006	-2.89**	0.18	-1.79*	-1.93*
2007	1.57	1.31	-1.40	1.61
2008	5.50**	6.28**	4.70**	6.54**
2009	1.51	3.20**	0.33	3.32**
2010	2.15**	3.26**	0.50	3.18**
2011	-0.17	-0.36	1.88*	0.15
2012	2.02**	4.06**	-0.59	4.37**
2013	0.84	5.91**		3.16**
<b>All Period</b>	<b>4.06**</b>	<b>9.55**</b>	<b>3.23**</b>	<b>7.23**</b>
<b>Bear Year 2000-2002</b>	<b>0.71</b>	<b>1.96*</b>	<b>0.11</b>	<b>1.11</b>
<b>Bear Year 2004-2008</b>	<b>3.31**</b>	<b>6.60**</b>	<b>3.08**</b>	<b>5.12**</b>
<b>Bull Year 2009-2012</b>	<b>2.33**</b>	<b>4.91**</b>	<b>1.19</b>	<b>5.01**</b>

### 7.1.3. BEME Style Dimension

Table 12 reports the robustness result in BEME dimension. After, the number of portfolios are reduced all investor types' degree of style investing except proprietary traders change to positively statistical significantly. In panel A, individual investors reveal strongest degree of style investing at t-value 5.04. Following by foreign investors, whose degree of style investing value equals 4.10 and institutional investors, whose degree of style investing value equals 2.27.

After erasing the investors' long term style portfolio preference, panel B reports that all of style reallocation intensity slightly decrease. In order, individual investors reveal strongest degree of style investing at t-value 4.35. Following by foreign investors, whose degree of style investing value equals 3.42 and institutional investors, whose degree of style investing equals 1.47.

**Table 13 Robustness Degree of Style investing (Reallocation intensity) in BEME Dimension****Panel A: Degree of Style investing (Reallocation intensity) in BEME Dimension**

Reports Newy-West adjusted t-statistics of style reallocation intensities against the mean of randomly drawn Monte Carlo reallocation intensity sample. The sample period is from January 1999 to December 2013. For each year 10,000 random Monte Carlo samples of styles are drawn so that their market capitalization matches the actual styles. Reallocation intensity is a measure of the cross variation in excess market flows. T-statistic is calculated from the daily difference between the actual style reallocation intensity and the mean Monte Carlo reallocation intensity.

Period	T-Value			
	Foreign	Institutional	Proprietary	Individual
1999	3.21**	1.71*	1.01	2.59**
2000	5.15**	2.86**	0.76	5.54**
2001	-1.31	2.45**	0.61	-0.75
2002	1.24	0.44	-1.66**	1.16
2003	0.08	-0.01	-0.69	1.48
2004	0.80	-1.24	0.51	1.40
2005	1.21	0.92	-2.11**	1.24
2006	-0.21	-0.25	0.23	1.04
2007	0.65	-0.75	-0.61	1.25
2008	-0.01	-0.38	1.91	1.24
2009	-0.51	1.61	-0.17	-1.30
2010	1.20	-0.10	-0.69	0.61
2011	-0.39	-0.64	-0.50	-0.70
2012	2.85**	3.15**	1.71**	2.81**
2013	1.88**	1.06		2.33**
<b>All Period</b>	<b>4.10**</b>	<b>2.27**</b>	<b>0.31</b>	<b>5.04**</b>
<b>Bear Year 2000-2002</b>	<b>3.12**</b>	<b>3.40**</b>	<b>-0.13</b>	<b>3.59**</b>
<b>Bear Year 2004-2008</b>	<b>1.05</b>	<b>-0.89</b>	<b>0.53</b>	<b>2.74**</b>
<b>Bull Year 2009-2012</b>	<b>1.49</b>	<b>1.52</b>	<b>-0.09</b>	<b>0.62</b>

**Panel B: Degree of Style investing (Reallocation intensity) in BEME Dimension (Exclude Style Preference)**

Reports Newy-West adjusted t-statistics of style reallocation intensities against the mean of randomly drawn Monte Carlo reallocation intensity sample. The sample period is from January 1999 to December 2013. For each year 10,000 random Monte Carlo samples of styles are drawn so that their market capitalization matches the actual styles. Reallocation intensity is a measure of the cross variation in excess market flow. T-statistic is calculated from the daily difference between the actual style reallocation intensity and the mean Monte Carlo reallocation intensity.

Period	T-Value			
	Foreign	Institutional	Proprietary	Individual
1999	2.91**	1.83**	0.96	2.33**
2000	4.97**	2.10**	0.71	4.71**
2001	-1.30	2.17**	0.96	-0.45
2002	0.71	0.14	-1.47	0.40
2003	-0.12	-0.21	-0.36	1.28
2004	0.82	-1.32	0.49	1.51
2005	1.20	0.91	-2.13**	1.23
2006	-0.21	-0.37	0.23	1.19
2007	0.48	-1.05	-0.62	1.15
2008	-0.05	-1.12	1.89*	1.13
2009	-0.88	1.42	-0.16	-1.52
2010	0.74	-0.13	-0.70	0.47
2011	-0.67	-0.84	-0.53	-1.13
2012	2.77**	3.02**	1.71*	2.90**
2013	1.76*	0.82		1.98**
<b>All Period</b>	<b>3.42**</b>	<b>1.47**</b>	<b>0.38</b>	<b>4.35**</b>
<b>Bear Year 2000-2002</b>	<b>2.61**</b>	<b>2.63**</b>	<b>0.11</b>	<b>2.76**</b>
<b>Bear Year 2004-2008</b>	<b>1.00</b>	<b>-1.40</b>	<b>0.50</b>	<b>2.78**</b>
<b>Bull Year 2009-2012</b>	<b>0.90</b>	<b>1.28</b>	<b>-0.11</b>	<b>0.32</b>



## 7.2. Style Preference

### 7.2.1. Size Style Preference

Robustness size style portfolio preference of all of investor types are reported in Table 14. In panel A, benchmark is weight of style portfolio in market portfolio. The result is more specific and indicates that foreign investors do not prefer to invest in small and large style portfolio. They choose to underweight large size stocks and small size stocks 57% and 73%. However, they prefer to invest in medium size stocks by overweight medium size style portfolio by 49%. Institutional investors' preference is more persistence. The result shows that they prefer to invest in large size style portfolio by overweight them 179% more than benchmark.

For proprietary traders, the result indicates that they prefer to invest in medium size style portfolio by overweighting 146%. Individual investors prefer to invest in small style portfolio as they overweight small size style portfolio 29%.

After benchmark is changed to Monte Carlo randomly expected position, the result is similar with previous and report in panel B. Foreign investors' preference style is medium size style portfolio as they overweight them 75% compare with benchmark. Institutional investors show that they prefer to invest in large size style portfolio by overweighting at 232%. For proprietary, the result is similar with previous that they prefer to invest in medium size style portfolio by overweighting them 164%. At last, the individual investors' style portfolio preference is small size style portfolio. They overweight mall size style portfolio by 74%.

**Table 14 Robustness Style Preferences of Investors in Market Value Dimension****Panel A: Style Preferences of Investors in Market Value Dimension (Market Weight Benchmark)**

Reports the average excess style position in the aggregate portfolio for each investor type in the sample. The sample period is from January 1999 to December 2013. The excess style portfolio  $k$  position at day  $t$  is the difference between the actual and the expected positions in style portfolio  $k$  at day  $t$ . Here, the expected position is the weight assigned to style portfolio  $k$  in the aggregate market portfolio.

Portfolio		Foreign	Mutual	Proprietary	Individual
Large Market Cap. Portfolio	Portfolio1	<b>-0.5718</b>	<b>1.7951</b>	<b>-1.4757</b>	<b>-0.6766</b>
	<i>T-Value</i>	-7.66**	7.45**	-8.04**	-10.94**
	Portfolio2	<b>0.4981</b>	<b>-1.2610</b>	<b>1.4625</b>	<b>-0.9678</b>
	<i>T-Value</i>	16.51**	-10.42**	7.23**	-15.73**
Small Market Cap. Portfolio	Portfolio3	<b>-0.7358</b>	<b>-1.8118</b>	<b>-0.5465</b>	<b>0.2944</b>
	<i>T-Value</i>	-16.05**	-8.75**	-2.18**	3.23**

**Panel B: Style Preferences of Investors in Market Value Dimension (Monte Carlo Benchmark)**

Reports the average excess style position in the aggregate portfolio for each investor type in the sample. The sample period is from January 1999 to December 2013. The excess style portfolio  $k$  position at day  $t$  is the difference between the actual and the expected positions in style portfolio  $k$  at day  $t$ . Here, the expected position is the average of 10,000 random actual style portfolio position values at day  $t$ .

Portfolio		Foreign	Mutual	Proprietary	Individual
Large Market Cap. Portfolio	Portfolio1	<b>-0.3001</b>	<b>2.3262</b>	<b>-1.3209</b>	<b>-0.2795</b>
	<i>T-Value</i>	-3.76**	8.78**	-6.94**	-4.38**
	Portfolio2	<b>0.7540</b>	<b>-0.9486</b>	<b>1.6448</b>	<b>-0.5303</b>
	<i>T-Value</i>	10.93**	-7.10**	8.10**	-8.99**
Small Market Cap. Portfolio	Portfolio3	<b>-0.4898</b>	<b>-1.4439</b>	<b>-0.2894</b>	<b>0.7400</b>
	<i>T-Value</i>	-10.00**	-6.62**	-1.15	8.25**

**7.2.2. Momentum Style Preference**

Robustness momentum style portfolio preference is reported in Table 14. In panel A, benchmark is weight of style portfolio in market portfolio. The result indicates that proprietary traders' style preference are ambiguous because they underweight highest past one year return style portfolio at 188% and they weight lowest past one year return style portfolio equal benchmark. However, other types of investor exhibit clarify trading behavior. Foreign investors exhibit contrarian trading behavior by overweighting lowest return style portfolio at 54%. Institutional investors exhibit a strong momentum trading behavior by overweight the highest return style portfolio at 394%. On contrary, individual investors overweight the style portfolio that have lowest return in past one year at 71% which means that they exhibit contrarian trading behavior.

Panel B reports result after benchmark is changed to Monte Carlo randomly expected position. Similar with previous result, proprietary traders trading behavior is not clarify because they underweight highest return style portfolio 164% and weight lowest return style portfolio equal benchmark. Foreign investors exhibit contrarian trading behavior by overweighting lowest return style portfolio at 82%. For institutional and individual investors, their result are consistence with previous. Institutional investors overweight the highest return style portfolio 445% but individual investors overweight the lowest return portfolio for 115%.

**Table 15 Robustness Style Preferences of Investors in Momentum Dimension**

**Panel A: Style Preferences of Investors in Momentum Dimension (Market Weight Benchmark)**

Reports the average excess style position in the aggregate portfolio for each investor type in the sample. The sample period is from January 1999 to December 2013. The excess style portfolio  $k$  position at day  $t$  is the difference between the actual and the expected positions in style portfolio  $k$  at day  $t$ . Here, the expected position is the weight assigned to style portfolio  $k$  in the aggregate market portfolio.

Portfolio		Foreign	Mutual	Proprietary	Individual
<b>Highest Return Portfolio</b>	<b>Portfolio1</b>	<b>-0.8363</b>	<b>3.9485</b>	<b>-1.8855</b>	<b>-0.8545</b>
	<i>T-Value</i>	<i>-9.35**</i>	<i>13.75**</i>	<i>-15.41**</i>	<i>-11.98**</i>
	<b>Portfolio2</b>	<b>-0.6467</b>	<b>1.4925</b>	<b>0.9784</b>	<b>-1.1596</b>
	<i>T-Value</i>	<i>-6.14**</i>	<i>6.74**</i>	<i>4.87**</i>	<i>-12.38**</i>
<b>Lowest Return Portfolio</b>	<b>Portfolio3</b>	<b>0.5412</b>	<b>-5.9709</b>	<b>-0.2813</b>	<b>0.7121</b>
	<i>T-Value</i>	<i>4.30**</i>	<i>-16.79**</i>	<i>-1.43</i>	<i>6.93**</i>

**Panel B: Style Preferences of Investors in Momentum Dimension (Monte Carlo Benchmark)**

Reports the average excess style position in the aggregate portfolio for each investor type in the sample. The sample period is from January 1999 to December 2013. The excess style portfolio  $k$  position at day  $t$  is the difference between the actual and the expected positions in style portfolio  $k$  at day  $t$ . Here, the expected position is the average of 10,000 random actual style portfolio position values at day  $t$ .

Portfolio		Foreign	Mutual	Proprietary	Individual
<b>Highest Return Portfolio</b>	<b>Portfolio1</b>	<b>-0.5601</b>	<b>4.4531</b>	<b>-1.6470</b>	<b>-0.5338</b>
	<i>T-Value</i>	<i>-6.29**</i>	<i>14.80**</i>	<i>-13.07**</i>	<i>-6.78**</i>
	<b>Portfolio2</b>	<b>-0.3458</b>	<b>1.8198</b>	<b>1.4059</b>	<b>-0.7212</b>
	<i>T-Value</i>	<i>-3.38**</i>	<i>8.84**</i>	<i>6.85**</i>	<i>-7.79**</i>
<b>Lowest Return Portfolio</b>	<b>Portfolio3</b>	<b>0.8292</b>	<b>-5.5689</b>	<b>0.0610</b>	<b>1.1598</b>
	<i>T-Value</i>	<i>6.67**</i>	<i>-15.50**</i>	<i>0.31</i>	<i>11.35**</i>

### 7.2.3. BEME Style Preference

Robustness BEME style portfolio preference is reported in Table 16. Table 16 indicates the consistence result as previous. In panel A, benchmark is weight of style portfolio in market portfolio. Foreign and institutional investors are indicated that they prefer to invest in value style portfolio by overweighting at 36% and 248%, in order. For proprietary traders and individual investors, the result indicates that they prefer to invest in growth stocks by overweighting growth style portfolio at 98% and 16%, in order.

After changing benchmark to Monte Carlo randomly expected position, reported in panel B. The result is consistence with previous. Foreign and institutional investors are indicated that they prefer to invest in value style portfolio by overweighting 60% and 284%, in order. For proprietary and individual investors, they prefer to invest in growth style portfolio by overweighting 128% and 64% in order.

**Table 16 Robustness Style Preferences of Investors in BEME Dimension**

**Panel A: Style Preferences of Investors in BEME Dimension (Market Weight Benchmark)**

Reports the average excess style position in the aggregate portfolio for each investor type in the sample. The sample period is from January 1999 to December 2013. The excess style portfolio  $k$  position at day  $t$  is the difference between the actual and the expected positions in style portfolio  $k$  at day  $t$ . Here, the expected position is the weight assigned to style portfolio  $k$  in the aggregate market portfolio.

Portfolio		Foreign	Mutual	Proprietary	Individual
Value Portfolio (High BEME value)	Portfolio1	0.3622	2.4804	-2.4132	-0.9387
	<i>T-Value</i>	3.82**	11.90**	-17.48**	-20.78**
	Portfolio2	-0.7251	-1.2920	0.8886	-0.5047
	<i>T-Value</i>	-8.15**	-9.73**	9.26**	-8.29**
Growth Portfolio (Low BEME value)	Portfolio3	-0.3285	-2.2388	0.9875	0.1649
	<i>T-Value</i>	-4.09**	-13.40**	8.57**	2.73**

**Panel B: Style Preferences of Investors in BEME Dimension (Monte Carlo Benchmark)**

Reports the average excess style position in the aggregate portfolio for each investor type in the sample. The sample period is from January 1999 to December 2013. The excess style portfolio  $k$  position at day  $t$  is the difference between the actual and the expected positions in style portfolio  $k$  at day  $t$ . Here, the expected position is the average of 10,000 random actual style portfolio position values at day  $t$ .

Portfolio		Foreign	Mutual	Proprietary	Individual
Value Portfolio (High BEME value)	Portfolio1	0.6032	2.8405	-2.2152	-0.5159
	<i>T-Value</i>	6.48**	13.38**	-16.24**	-12.52**
	Portfolio2	-0.4875	-1.0260	1.1321	-0.0809
	<i>T-Value</i>	-5.64**	-7.85**	11.47**	-1.39
Growth Portfolio (Low BEME value)	Portfolio3	-0.0387	-1.8897	1.2814	0.6401
	<i>T-Value</i>	-0.47	-11.19**	11.12**	10.90**

## 8. Conclusion

This paper use a unique data set which consist of all of trading execution data since 1999-2013 from the Stock Exchange of Thailand (SET) to examine style trading behavior of four investor types compose of foreign investors, institutional investors, proprietary traders and individual investors simultaneously. The evidence reveals that all types of investor use style investing as their fund reallocation strategy. However, all type of investors consider only size and return momentum as characteristic that involve in their categorization process but value and growth characteristic are not considered.

In addition, this research also unveil the style preference for each investor type. For professional manager like foreign investors, they prefer to invest in medium market capitalization style and high book to equity or value style. Further, they are found to follow negative feedback or contrarian strategy. On contrary, institutional investors are found to be a positive feedback or momentum investor and they prefer to invest in large market capitalization style and high book to equity or value style.

For proprietary traders and individual investors, they exhibit similar behavior. They prefer low book to equity or growth style and both of them are found to be a negative feedback or contrarian investor. However, the difference between proprietary traders and individual investors is in size style. Proprietary traders prefer to invest in medium market capitalization style but individual investors prefer to invest in small market capitalization style.

Overall, this research indicate that the classification process of similar characteristic stocks into categories or can be called “style” is an important process for investors’ portfolio construction and fund reallocation.

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## APPENDIX

### Example of style investing model

Assuming that only 100 assets are traded in market, the first 50 assets are in style X and the last 50 assets are in style Y. Suppose that there are some good news about style X. Then, switchers tend to allocate their fund into Style X. It makes price of style X rise above its fundamental value. On the other hand, switchers have to withdraw their fund from style Y because of limited fund resource. This action presses price of style Y lower than its fundamental value. However, their prices return to its fundamental eventually. There are many reasons which can create this reversal phenomenon. First, the reversal of price comes from fundamental trader who arbitrage asset price. Second, style X's fundamental is worsen or good news are pronounced from style Y. These effects make switchers draw fund out of style X and go into style Y. In addition, their model also shows that even if only one asset in style X receives a cash flow news, it affects not only its price but impacts all assets' price in style X, making every assets' price in style X increase.



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