A STUDY ON FUNDAMENTAL FACTORS OF STOCKS AND FUTURE RETURNS BASED ON AN ANALYSIS OF COMPANIES LISTED IN THE STOCK EXCHANGE OF THAILAND (SET) DURING 2010 – 2016

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Abstract

A lot of fundamental factors can be used to help to evaluate stocks. Many fundamental factors of stocks could be drawn from financial statements directly or calculated from some items in the financial statements. Some items from financial statements could imply something useful for buying decision. This study utilizes the methods of regression model, logit model, and groups analysis to study the relationships between fundamental factors and the returns in the Stock Exchange of Thailand (SET) during periods after the subprime crisis. The findings show that the Price to Book ratio, the Dividend Yield, and the Total Assets Value have strong relationships with stock returns. The Profit Margin, the Earnings before Interest and Tax, the Book Value per Share, the Dividend per Share, the Asset Turnover ratio, and the Market Value of Equity have moderate relationships. However, there are some interesting patterns from the groups analysis such as the Price to Earnings to Growth ratio, the Operating Cash Flow, the Earnings Yield, and the Return on Equity.

Keywords: Fundamental analysis, Future stock return, Financial statement

1. Introduction

To consider a company's past performance is one of the ways to assess the future direction and provide a better understanding of a company's performance

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(Gitman and Joehnk, 2008). It is very important for investors to use the financial information or fundamental factors from income statement, balance sheet, and statement of cash flow in analyzing the company's performance to assess the company's intrinsic value (Buffett and Clark, 2008). Several researchers employed financial information in stock selection analysis and company analysis, such as Wu and Wang (2000), Sareewiwatthana (2011), Aras and Yilmaz (2008), and Narktabtee (2013).

As the Subprime (Subprime Mortgage Credit) crisis occurred in the U.S., the crisis affected the financial institutions and the capital markets around the world, including the Stock Exchange of Thailand (SET). The SET index had been dropping down from that circumstance, and after that the SET index has been gradually increasing. Some researchers such as Narktabtee (2013), Tanasittipan (2013), Sareewiwatthana (2012), and Udomrungruang (2006) studied about the fundamental factors and the Stock Exchange of Thailand (SET).

If there exist some information that are not widely used or ignored among investors and they are not completely absorbed into the stock market, investors can still use those information for predicting the future returns and earn the abnormal profit (Reilly and Norton, 2006). However, sufficient or moderate profit is the target of the investors, who concern about the quality of the company, not about the artificial look of the company (Graham, 2003).

This study tries to add more fundamental factors; and aims to check if the information from the stocks' fundamental factors appeared in the financial statements relate to the returns from those stock investments in the future and can be used to gain a greater return than the market. Additionally, the research intends to provide new evidences on the relationships between the stocks' fundamental factors and their future stock returns; and empirically search for more facts and better explanations behind the stock investment knowledge with Thai stock market.

2. Literature Review

The precisely reflecting of the true value in the market price of an investment implies a logical market efficiency, but the degree of

efficiency varies among different investment markets (Tyson, 2008). However, Awad and Daraghma (2009) found that the Palestine Security Exchange was inefficient in the weak form of efficient market hypothesis. Gitman and Joehnk (2008) indicated that it is difficult for investors to outperform the market persistently; nevertheless, there are inevitably the pricing errors in the security market.

Investors should comprehend and examine the financial statements, including the reports of the companies (Gitman and Joehnk, 2008) so that accurately estimating of the intrinsic value could generate higher average returns from obtaining undervalued securities (Reilly and Norton, 2006). Analyzing companies' financial statements is an essential method in the fundamental valuation approach and it also assists the investor to avoid the restriction on the discounted cash flow valuation methods (Bauman, 1996). The company's quantitative or statistical exposure contains all the useful figures for investors including capitalization, earnings, dividends, assets, and liabilities (Graham and Dodd, 2009).

There are various investment principles which were effectively employed and suggested by many famous value investors. For examples, Benjamin Graham advised the defensive investor to buy big company stock at the appropriated price with adequate strong financial condition, steady growth earnings, continuous profit, and uninterrupted dividend payment (Graham, 2003). Philip A. Fisher suggested on investing in stocks of growth companies which have excellent businesses, strong financial conditions, low level of debts, and well management (Ross, 2000) including long term increase in sales potential and profit margin (Fisher, 2003). John Templeton used several fundamental factors from financial statement in his analysis, such as book value of equity, firm's profit, price to earnings ratio, earnings growth, operating margin, price to book ratio, and total assets to total liabilities ratio in his stock selection (Ross, 2000). The following part is the explanation and literature review relating to the selected fundamental factors.

Price to Earnings ratio: Graham (2003) suggested that defensive investors should buy stocks with moderate price to earnings ratio. Chen, Kim and Zheng (2008) found that

the returns would be generated well by the stocks with low P/E than the stocks with high P/E on the condition that stocks were traded frequently in the US stock markets. Truong (2009) showed that as an evidence from the New Zealand stock exchange, the low P/E stocks generated better returns than the high P/E stocks. Additionally, Jones (2008) found there was an impact of P/E ratio to the average stock returns of S&P 500 on a shorter period. Aras and Yilmaz (2008) found that the P/E ratio had slightly positive relation to the returns during 1997 and 2003 in emerging market countries by employing the regression method.

Price to Earnings to Growth ratio: Generally, when the price to earnings to growth (PEG) ratio of a firm is lower than 1, it shows that the stock of that firm is inexpensive. Easton (2004) found the PEG ratio is an effective factor in grouping of the equities in S&P 500. Sareewiwatthana (2012) used the PEG ratio in his stock screening rule to create the portfolios and found that stocks with low PEG ratio could generate better returns than the market returns in the Thai stock market during 1999 and 2010. I'Ons (2010) showed that the PEG was an

effective factor in a valuation tool in all Johannesburg Stock Exchange.

Earnings Yield: Jaffe, Keim and Westerfield (1989); and Keim (1990) found the earnings yield positively related to the stock returns over the monthly period between 1951 and 1986 in NYSE and AMEX. Wu and Wang (2000) demonstrated that earnings yield had extremely positive relation with the future returns in S&P 500. In addition, Salomons (2006) also found the earnings yield of companies in S&P 500 have significantly positive relationship with 10-year subsequent equity returns between 1881 and 2002 by employing the regression model. According to the investigation the companies in the Tokyo Stock Exchange, however, Chan, Hamao and Lakonishok (1991) found the earnings yield had significantly both positive and negative effect on returns in the stock market.

Earnings before Interest and Tax: Sharma and Preeti (2009) used the EBIT as a financial factor to compare companies in the National Stock Exchange of India during 1998 and 2007 and found the EBIT of average companies are higher than those of small companies. Bunsaisup (2014) studied the

relationship between investment strategies and stock returns in the Thai stock market during 2005 and 2013. The EBIT per asset is employed to create portfolios in comparing portfolio performance. Eberhart (2004) used the EBIT as a factor in stock valuation technique on Dow Jones from 2001 to 2002.

Earnings Growth: Warren Buffett buys stock that its company's earnings increases every year (Buffett and Clark, 2008). Oppenheimer (1984) found the mean annual returns of portfolios created from stocks following the earnings growth factor of Graham's criterion could generate better returns than the market returns of NYSE and AMEX during 1974 and 1981. Moreover, Fielitz and Muller (1985); Sharma and Preeti (2009); and Yu and Kim (2009) used the earnings growth factor to identify the company's performance and excess returns effectively.

Earnings per Share: Buffett suggested that a good stock should have a steady increase in earnings per share at least in the past ten years (Buffett and Clark, 2008). Squyres (1998) adopted the EPS factor representing the growth rate factor and firm performance in U.S. market between 1993

and 1997. Tanasittipan (2013) used the EPS data in the research to study the effect on the returns in the Thai stock market after the companies' earnings were announced during 2005 to 2012. Narktabtee (2013) employed the EPS, not only for differentiating stocks between value and growth stocks, but also as a performance indicator to examine the difference characteristic between value and growth stocks in the Thai security markets.

Profit Margin: Squyres (1998) selected the profit margin as one of the profitability ratio factors to prove the concept of Graham and Dodd. The research results implied that the prices of stocks were related to the firms' profit margins in most of the tested firms in U.S. market between 1993 and 1997. Further, Meesuwan (2015) found the net profit margin had a positive relationship with the future returns in the Stock Exchange of Thailand (SET) during 2006 and 2014, which the regression model was analyzed in the study.

Return on Equity: Figelman (2007) found that the firms with high ROE significantly underperformed the market and underperformed the firms with low ROE in S&P 500 during 1970 and 2004. However, Sareewiwatthana (2011, 2013) found that the

firms with high ROE had significantly higher stock returns than the average Thai stock market return from 1996 to 2012.

Return on Invested Capital: Graham (2003) and Koller, Goedhart and Wessels (2010) indicated that company that has a high ROIC may have a good profitability, the stability in company's profit, and the expectation of increased profits in the future. Yu and Kim (2009) adopted ROIC variable in the logit model of the opportunity of being picked up as the growth stock which had a strong return in S&P 500 during 1985 and 2004.

Sales to Price: It is not easy to know which company performs better than others especially if those companies have similar market capital. In addition, those companies' earnings yield may also show higher than the industry average. The company which has lower earnings but expresses higher sales to price may show a better opportunity to develop the general business operation. Thereby, the sales to price can give a clearer picture to estimate the company's value and the stock return in the future (Graham and Dodd, 2009). Barbee, Mukherji and Raines (1996) found that during 1979 to 1991 by using regression model, the sales to price had significant positive relationship to the returns in the NYSE and AMEX. Gueard, Jr. (2006) found the sales to price ratio was a significant factor in describing stock returns in Japanese, and the US security market.

Selling, General, and Administrative Expenses to Gross Profit: Buffett and Clark (2008) mentioned about the ratio of the SG&A compared to gross profit and suggested that the lowest the SG&A to gross profit of the firm, the better company's performance and the better durable competitive advantage. Most of the studies selected only SG&A or the ratio of SG&A with sales. For example, Abarbanell and Bushee (1998) used the SG&A as a fundamental signal of analysts' information in assessing abnormal returns in NYSE and AMEX market. Anderson, Banker, Huang, and Janakiraman (2007) used the SG&A which was compared to sales in estimating an earnings prediction model and found a positive relationship between future earnings and changes in the SG&A ratio in the periods when the sales decreased. Similarly, Janakiraman (2010) also found the SG&A to sales positively related to the firm's profit.

Book Value per Share: In the study

following Graham's criteria, Oppenheimer (1984) used the book value per share as a fundamental factor. The excess returns of the created portfolios were significant for NYSE and AMEX during 1974 and 1981 periods. Squyres (1998) employed the growth rate of book value per share factor to estimate the performance of the company in US stock market between 1993 and 1997. Chung and Kim (2001) created the model by using the book value per share and other fundamental factors to predict the stock prices in the Korea Stock Exchange.

Price to Book ratio: Graham (2003) suggests that the appropriate P/B ratio should not be greater than 1.5. The P/B ratio can be more than 1.5 if the P/E ratio is less than 15. Capaul, Rowley and Sharpe (1993) found stocks with low P/B ratios offered better returns than stocks with high P/B ratios during 1981 to 1992 in stock markets of France, Germany, Switzerland, the U.K., the U.S., and Japan. In NYSE and AMEX during 1965 and 1994, Jensen, Johnson and Mercer (1997) proved the P/B was negatively related to the stock returns during the period of the expansionary monetary policy. However, Aras and Yilmaz (2008) found the P/B ratio

could strongly predict the stock returns for future one-year period in the emerging markets.

Total Assets Value: Due to the U.S. stock market, Cooper, Gulen and Schill (2008) found that the growth of total assets could be used to predict the stock return from 1968 to 2002. However, the relationship between total assets and firm's performance or profitability could be positive, negative, or even no relation; and the current firm's profitability tends to relate closely to the firm's future stock returns (Khatab, Masood, Zaman, Saleem and Saeed, 2011; Pervan and Višić, 2012; Khan, 2012; Doğan, 2013; and Hatem, 2014).

Net Current Asset Value: Graham (2003) suggested the investors should buy a stock whose market price is less than its NCAV per share, and Oppenheimer (1984, 1986) found selected stocks following Graham's criteria of the NCAV could generate better returns than the market returns of NYSE and AMEX. Moreover, Xiao and Arnold (2008) referred to Graham's suggestion of a stock selection method and found purchasing stocks having a per share NCAV more than 1.5 times the market prices of

stocks in the London Stock Exchange during 1980 and 2005 generated a better performance than the market.

Return on Assets: Sharma and Preeti (2009) found the stock whose ROA was greater than the industrial mean tended to have higher future returns than the stock whose ROA below industrial mean during 1998 and 2007 in the National Stock Exchange of India. The ROA has been regularly used as the dependent variable which represent the financial firm performance in many financial researches, such as the research of Sudiyatno, Puspitasari, and Kartika (2012), Khatab et al. (2011), and Hatem (2014).

Asset Turnover ratio: A good company typically have a high asset turnover ratio (Jean-Jacques, 2003). A firm with higher asset turnover implies the firm is well operated on turning its resources into higher revenue, and it also implies the company's profit will be significantly higher (Gitman and Joehnk, 2008). Sharma and Preeti (2009) showed the stock with the higher asset turnover ratio tended to have the higher future market return than the stock with opposite condition in the National Stock Exchange of India from

1998 to 2007. Meesuwan (2015) used the asset turnover to demonstrate the returns in the Thai stock market during 2006 and 2014.

Current Ratio: If the company's current assets surpass its current liabilities, it implies that the company financial position is stable (Graham and Meredith, 1998). Sharma and Preeti (2009) found the group of stocks with the current ratios of current period higher than the former period ratio tended to have greater average future return than the group with opposite condition in the Indian stock market from 1998 to 2007. Oppenheimer (1984) found that the selected stocks following Graham's criteria of the current ratio could generate better returns than the market returns in NYSE and AMEX. Maskun (2012) studied about the effect between the current ratio and the stock returns of companies in Indonesian Stock Exchange (BEI) from 2006 to 2010.

Debt to Equity ratio: A higher debt to equity ratio indicates a firm has more financial leverage. Bhandari (1988) found there was a positive relation between the debt to equity ratio and the expected returns on common stocks during 1948 to 1979 in NYSE. Similarly, Barbee et al. (1996) found

the debt to equity ratio had a positive relation to the stock returns of non-financial firms listed in NYSE and AMEX during 1979 and 1991. Hull (1999) found the firms whose leverage values were significantly different from the industrial leverage norm tended to have more negative relationship to the stock returns than the firms whose leverage value came closer to the industrial norm in NYSE, AMEX, and OTC market. Sharma and Preeti (2009) found the stock tended to have higher future market adjusted return if the leverage ratio of that stock is less than the former period in the Stock Exchange of India.

Market Value of Equity: Gitman and Joehnk (2008) explained that the size of regular firm is based on the market value of equity (MVE) or the market capitalization. Jaffe et al. (1989) found that the factor of company size could be used to predict the returns in some periods during 1951 and 1986 in NYSE and AMEX. Similarly, Keim (1990) found during 1951 and 1986, sizes of firms in NYSE and AMEX also affected the returns in some periods. Jensen et al. (1997) expressed the size of company related to the returns for all levels of systematic risk in NYSE and AMEX form 1965 till 1994. Chan et

al. (1991) proved that small size companies in the Tokyo Stock Exchange could outperform the larger companies.

Cash Flow Yield: Chan, Hamao, and Lakonishok (1993) found a portfolio of stocks which had high value of cash flow yield outperformed a portfolio of stocks which had low value of cash flow yield and found cash flow yield has a significant positive relationship with the expected stock returns in the Tokyo Stock Exchange during 1971 and 1988. Robertson and Wright (2006) found the cash flow yield that included dividend and non-dividend cash flows could be used to predict future U.S. stock returns during 1900 and 2000. Guerard Jr. (2006) found the impact of cash flow yield was statistically significant in Japan, the U.S., and international securities during 1988 to 2003.

Operating Cash Flow: Good business should have sufficient amount of cash from normal business operations to maintain and grow its operating activities (Graham, 2003). Sharma and Preeti (2009) adopted the CFO for giving score to the selected stocks from the Stock Exchange of India. This research indicated the stock will earn the score if the CFO is greater than the EBIT. Sukanjanapong

(2007) used the operating cash flow to sales in forming portfolio of the firms listed in the Stock Exchange of Thailand during 2002 and 2005 in the study.

Return on Asset (using Cash Flow): Sharma and Preeti (2009) adopted the ROA (using cash flow) as a fundamental factor for giving score to the selected stocks. This research indicated that the stock will earn the score if the ROA using cash flow of the firm is greater than the industrial average. Pekdemir, Mutiu, Y'ónet, Avram, and §engiir (2011) employed the ROA using cash flow as an indicator in comparing the companies' performances between Turkish and Romania stock market.

Dividend per Share: As the concept of stock investment, the dividend payment is closely parallel to the stock returns (Graham and Dodd, 2009). However, Oppenheimer (1986) found companies with positive earnings and dividend payment generated lower return than companies with positive earnings and no dividend payment from 1970 to 1983 in the US stock markets. According to the firms in Tehran Stock Exchange (TSE), Saeidi and Khandoozi (2011) showed that the DPS had a significant relationship with the

market stock prices during 2003 and 2009.

Dividend Yield: Wu and Wang (2000) found the dividend yield could be a good predictor for the long-term stock returns in the S&P 500, and there was a positive relationship between them during 1871 to 1995 period. Aras and Yilmaz (2008) also found the dividend yield was preferably good indicator and positively related to the stock returns in the emerging stock markets. Visscher and Filbeck (2003) found the strategy of investing in stocks with high dividend yield was effective for the Toronto 35 Index during 1987 and 1997.

Dividend Payout ratio: Graham (2003) differentiated the growth and non-growth stocks by using the dividend policy. The income issue, which is long term dividend, is emphasized on non-growth firm. On the other hand, cash-dividend is not emphasized on the growth companies. However, a lot of firms are unclear and lie between growth and non-growth companies. Memon, Channa, and Khoso (2017) found there was a positive relationship between the payout ratios and stock prices for firms in Pakistan during 1965 to 2009. Li (2015) found out that the dividend payout ratio had an effective predictability

power on future stock returns in the US stock markets.

Dividend Growth: Sometimes, some companies which have the growth in earnings might not pay much dividend. However, there is an opportunity for company which has earnings growth to have dividend growth (Hirschey and Nofsinger, 2008). According to the dividend yields causing the dividend growth forecasted, Goetzmann and Jorion (1995) found the dividend growth had significant relationship with stock returns in the US and UK stock markets between 1872 to 1992. Gwilym, Seaton, and Thomas (2005) found companies who had growth in dividend payment would have higher returns in U.K. stock returns.

3.   Research Methodology

Research Framework

This research framework is developed from theory of the real corporate value which could be measured from the information in financial statements (Graham and Dodd, 2009; Buffett and Clark, 2008; Damadorian, 2006) and from several empirical evidences of market inefficiency or the predictability of future stock returns from

fundamental factors in many stock markets.

Every factor in this research is selected from the supported previous studies, financial theories, and successful investors' principles. All factors were from firms listed only in the Stock Exchange of Thailand (SET). Some fundamental factors were excluded, because of the statistical problem, such as the multicollinearity problem from highly correlation between independent variables. In this study, by applying the concept of Graham and Dodd (2009) and Buffett and Clark (2008), these factors could be categorized into 3 basic groups, concerning to the items appeared in the firm's income, the firm's balance sheet, and the firm's cash flow (including dividend). Each factor was assigned to be in one group only, based on the most fitted meaning and implication.

Research Models

This research adopted 3 methods to test the relationship between fundamental factors and future returns, which are multiple linear regression, logit regression, and groups analysis. Various studies applied the linear regression analysis to their researches of fundamental factors, such as Bhandari (1988);

Chan et al. (1991); Abarbanell and Bushee (1998); Hull (1999); Wu and Wang (2000); Piotroski (2000); Gueard, Jr. (2006); Hahn, O'Neill and Swisher (2007); Tanasittipan (2013); Bunsaisup (2014); and Meesuwan (2015). Several studies as Goetzmann and Jorion (1995); Robertson and Wright (2006); Penman, Richardson and Tuna (2007); Pontiff and Woodgate (2008); Cooper et al (2008); Wei and Xie (2008); Aras and Yilmaz (2008); and Dosamantes (2013) also created their own cross-section or time series regression models to test the relationships between the fundamental factors and the future stock or returns. This research applies the concept of regression analysis to create the first group of research models from three separated categories of fundamental factors. These models are the cross-section linear regression models which are used to test the relationships in a selected specific year t.

Model 1 is developed to test the factors concerning to the items appeared in the firm's income statement, is showed as follow:

$$RET_{it+n} = \alpha' + \beta_1 PE_{it} + \beta_2 PEG_{it} + \beta_3 EP_{it} + \beta_4 EBIT_{it} + \beta_5 EG_{it} + \beta_6 EPS_{it} + \beta_7 PM_{it} + \beta_8 ROE_{it} + \beta_9 ROIC_{it} + \beta_{10} SP_{it} + \beta_{11} SGAGP_{it} + \varepsilon_{it}$$

where RET = Future Stock Return; PE = Price to Earnings ratio; PEG = Price to Earnings to Growth ratio; EP = Earnings Yield; EBIT = Earnings before Interest and Tax; EG = Earnings Growth; EPS = Earnings per Share; PM = Profit Margin; ROE = Return on Equity; ROIC = Return on Invested Capital; SP = Sales to Price; SGAGP = Selling, General, and Administrative Expense to Gross Profit; ε = regression residual; i = firm i; t = a selected test year t; n = number of additional quarterly periods in the future; β = regression slope coefficient; and α = regression intercept coefficient.

Model 2 is created to test the factors concerning to the items appeared in the firm's balance sheet statement, and showed as follow:

$$RET_{it+n} = \alpha'' + \beta_{12} BVPS_{it} + \beta_{13} PB_{it} + \beta_{14} TA_{it} + \beta_{15} NCAV_{it} + \beta_{16} ROA_{it} + \beta_{17} STA_{it} + \beta_{18} CACAL_{it} + \beta_{19} DE_{it} + \beta_{20} MVE_{it} + \varepsilon_{it}$$

and the explanations of the variables, which are different from Model 1, are BVPS = Book Value per Share; PB = Price to Book ratio; TA = Total Assets Value; NCAV = Net Current Asset Value; ROA = Return on Assets; STA =

Asset Turnover ratio; CACL = Current ratio; DE = Debt to Equity ratio; and MVE = Market Value of Equity.

Model 3, following the same structure, is built to test the factors concerning to the items appeared in the firm's cash flow statement (including dividend), and showed as follow:

$RET_{it+n} = \alpha''' + \beta_{21}CFP_{it} + \beta_{22}CFO_{it} + \beta_{23}ROACF_{it} + \beta_{24}DPS_{it} + \beta_{25}DivP_{it} + \beta_{26}Payout_{it} + \beta_{27}DivG_{it} + \varepsilon_{it}$

where CFP = Cash Flow Yield; CFO = Operating Cash Flow; ROACF = Return on Assets (using Cash Flow); DPS = Dividend per Share; DivP = Dividend Yield; Payout = Dividend Payout ratio; and DivG = Dividend Growth. Other variables have the same meaning as Model 1 and 2.

The second group of research models (Model 4 – 6) applied the cross-section logit regression analysis which uses a non-linear log transformation to predict the odds ratio or probability. The value of dependent variable in this model can only be either 0 (the situation that the stock return is equal or lower than the average market return) or

1 (the situation that the stock return is higher than the average market return). The logit regression model has been applied in some research works relating to the test of fundamental factors, such as Setiono and Strong (1998); Joos and Plesko (2005); and Yu and Kim (2009).

Model 4, used for testing the factors concerning to the items appeared in the firm's income statement, is showed as follow:

$$PR(Y_{it+n}=1|X) = \frac{1}{\left(1+e^{-X_{it}}\right)}$$

$X_{it} = \gamma' + \varphi_1PE_{it} + \varphi_2PEG_{it} + \varphi_3EP_{it} + \varphi_4EBIT_{it} + \varphi_5EG_{it} + \varphi_6EPS_{it} + \varphi_7PM_{it} + \varphi_8ROE_{it} + \varphi_9ROIC_{it} + \varphi_{10}SP_{it} + \varphi_{11}SGAGP_{it} + \varepsilon_{it}$

where $PR(Y_{it+n}=1|X)$ refers to the probability that the value of dependent variable (Y) in the n future periods is equal to 1 based on the given independent variables (X); and for this study, it refers the probability of the condition that the stock return of company i is greater than the stock market return during the same n future periods after the selected year t of study. Definitions of the

fundamental factors are the same as those from Model 1.

Model 5 was created to test the factors relating to the items appeared in the firm's balance sheet statement, as follow:

$$PR(Y_{it+n}=1|X) = \frac{1}{\left(1+e^{-X_{it}}\right)}$$

X_{it} = γ'' + $\phi_{12}BVPS_{it}$ + $\phi_{13}PB_{it}$ + $\phi_{14}TA_{it}$ + $\phi_{15}NCAV_{it}$ + $\phi_{16}ROA_{it}$ + $\phi_{17}STA_{it}$ + $\phi_{18}CACL_{it}$ + $\phi_{19}DE_{it}$ + $\phi_{20}MVE_{it}$ + ε_{it}

and **Model 6** was built under the same structure to test the factors relating to the items appeared in the firm's cash flow statement (including dividend). The model is showed as follow:

$$PR(Y_{it+n}=1|X) = \frac{1}{\left(1+e^{-X_{it}}\right)}$$

X_{it} = γ''' + $\phi_{21}CFP_{it}$ + $\phi_{22}CFO_{it}$ + $\phi_{23}ROACF_{it}$ + $\phi_{24}DPS_{it}$ + $\phi_{25}DivP_{it}$ + $\phi_{26}Payout_{it}$ + $\phi_{27}DivG_{it}$ + ε_{it}

and the definitions of variables used in model 5 and 6 are the same as those in Model 2 and 3, respectively. The 2-tailed Z-test is used to test the significant

relationships between factors and future returns.

The last research model applied the concept of the groups analysis. The groups analysis refers to the method of observing, comparing, or testing the returns or performance from the different portfolios of stocks "grouped" by the ranking or ordering of the values of one or several selected fundamental factors. This method has been applied with many research works to show the relationships between the fundamental factors and returns, such as Chan et al (1991); Jensen et al (1997); Mukherji, Dhatt and Kim (1997); Piotroski (2000); Gwilym et al (2005); Anderson and Brooks (2007); Hahn et al (2007); Chen et al (2008); Cooper et al (2008); Xiao and Arnold (2008); Sareewiwatthana (2011, 2012, 2013); Narktabtee (2013); and Meesuwan (2015).

This groups method shows that the stocks with different values of fundamental factors (in average) may generate the different outcomes. Some patterns of relationship that cannot be detected by regression analysis may show up from this method. Processes start from selecting one factor from the previous tests, and ranking

stocks based on the values of that factor from lowest to highest. Stocks are grouped into 5 portfolios with equal number of stocks in every portfolio. After that, the equal weighted average value of future stock returns in both short run and long run of every portfolio is calculated and compared. The pattern of relationship could be observed through the table and graphical presentation (Chan et al, 1991; Anderson and Brooks, 2007; and Hahn et al, 2007).

Research Hypotheses

The research hypotheses are developed to test the statistical relationships between the fundamental factors and future stock returns of all available companies listed in the Stock Exchange of Thailand. This research selects the year-end values of 27 fundamental factors from year 2010 to 2013 and tests those factors with six periods of future stock returns measured from year 2011 to 2016. However, the research adopts the test of the fundamental factors from each year separately or cross-sectional test only.

For the multiple linear regression model, an example of the null hypothesis,

for testing the relationship between a selected fundamental factor from the financial statements and a specific future period of stock return can be showed as;

Ho: There is no statistical significant relationship between the firm's selected fundamental factor from a specific year t and the firm's (1-quarter, 2-quarter, 3-quarter, 1-year, 1.5-year, or 2year) future stock return.

Under the logit regression analysis, the estimated regression coefficients and their p-value will be reported. The statistical hypothesis is tested by the 2-tailed Z test. Example of the null hypothesis can be showed as;

Ho: There is no statistical significant relationship between the firm's selected fundamental factor from a specific year t and the probability that the firm's (1-quarter, 2-quarter, 3-quarter, 1-year, 1.5-year, or 2year) future stock return is greater than the same-period average stock market return.

After that, all factors are tested through the groups analysis. However, there is no statistical hypothesis testing for the groups analysis because it tests the relationships from observing the patterns from the results showed in the tables.

This research separates the future stock returns from 2 general investment time periods, including short-term and long-term. The short-term period is defined as an investment period of shorter than 1 year. Therefore, the short-term future stock returns can be tested through 1, 2, and 3 quarterly future stock returns; and the long-term stock returns include the tests of 1, 1.5, and 2 years future returns.

Data Sources

The research adopted the fundamental factors derived from year-end annual reports or existing reports at the end of the year from 4 consecutive years, year 2010 to 2013. The main reason of selecting year 2010 as the first selected year of analysis is that there exists a structural change or the totally change of trend of stocks in Thai stock market during the US Subprime crisis (happened during 2007 – 2009).

The number of firms included in each year analysis is approximately 250 – 350 firms based. The numbers of firms are limited by the availability of the data for each fundamental factor used in both regression analyses.

If the Thomson Reuters Datastream could provide the values of those specific factors directly and provided enough number of firms for testing, those factors are used in the models. However, values of some factors that are not provided directly by Thomson Reuters will be estimated by using raw data from the Thomson Reuters or the Stock Exchange of Thailand.

Derivation of the dependent variables (future stock returns)

Because fundamental factors from the end of year 2010 is used as the first year for the research independent variables, the future stock returns are calculated from the percentage change in average quarter price starting from the first quarter of year 2011. The quarter future returns for this case of year 2010 factors can be easily showed as follow;

$$1-quarter\ future\ stock\ return_{factor,\ year2010} = \frac{Price_{2nd\ Quarter,year2011} - Price_{1st\ Quarter,year2011}}{Price_{1st\ Quarter,year2011}}$$

$$2-quarter\ future\ stock\ return_{factor,\ year2010} = \frac{Price_{3rd\ Quarter,year2011} - Price_{1st\ Quarter,year2011}}{Price_{1st\ Quarter,year2011}}$$

$$3-quarter\ future\ stock\ return_{factor,\ year2010} = \frac{Price_{4th\ Quarter,year2011} - Price_{1st\ Quarter,year2011}}{Price_{1st\ Quarter,year2011}}$$

$$1-year\ future\ stock\ return_{factor,\ year2010} = \frac{Price_{1st\ Quarter\ year2012} - Price_{1st\ Quarter,year2011}}{Price_{1st\ Quarter,year2011}}$$

$$1.5-year\ future\ stock\ return_{factor,\ year2010} = \frac{Price_{3rd\ Quarter,year2012} - Price_{1st\ Quarter,year2011}}{Price_{1st\ Quarter,year2011}}$$

$$2-year\ future\ stock\ return_{factor,\ year2010} = \frac{Price_{1st\ Quarter,year2013} - Price_{1st\ Quarter,year2011}}{Price_{1st\ Quarter,year2011}}$$

where Price1st Quarter, year 2011 refers to average value of daily stock prices from the 1st quarter of year 2011. Other prices are defined in the same way. This research applies this method to calculate the future stock returns for the factors measured from year 2010 to 2013. The period of the calculated future returns covers the stock prices from year 2011 to 2016.

4. Results

According to the results from the regression analysis (Table1), all of the selected fundamental factors have significant relations with the future stock returns either in short-term or long-term or both. However, the research concerns only some factors which are considered to have stronger relationships than others in terms of the number of rejected null hypotheses above all of the test hypotheses on each factor and each time period (short-term or long-term). Note that there are twelve hypotheses, from 3 test periods in short or long term in each year and there are also 4 test years, for every selected fundamental factor. From the short-term tests, the most significant factor is the Price to Book ratio. Nine from twelve null hypotheses were rejected, and all show significant negative relation between the Price to Book ratio and future stock returns. Other three factors, the Profit Margin, the Return on Invested Capital, and the Dividend Yield, have the moderate relationships, because six null hypotheses were rejected for each factor. The Return on Invested Capital and the Dividend Yield tend to have positive relationships, but the Profit Margin has negative relations with future stock returns.

From the long-term tests, the Price to Book ratio and the Dividend Yield are the most significant factors, because eleven of each factor's null hypothesis were rejected. Like the short-term tests, the Price to Book ratio has negative relation while the Dividend Yield has positive relation with returns. The

Earnings Yield, the Earnings before Interest and Tax, the Book Value per Share, and the Dividend per Share have moderate and negative relationships. Around six to eight of the hypotheses were rejected for each

Earnings before Interest and Tax, the Profit Margin, the Book Value per Share, and the Dividend per Share have moderate impacts to stock returns. Other factors have weak relationships, because each has significant results only from a few testing periods.

Results from the logit regression, as showed in Table 2, expresses the different outcomes. The Total Assets Value, the Asset Turnover ratio, and the Market Value of

factor. Moreover, when the results from two periods are combined, the Price to Book ratio and the Dividend Yield have the strongest relationships and the Earnings Yield, the

Equity are the most significant factors from the logit test. However, their relationships are only in moderate level in both short and long term, because around 6 to 8 from 12 null hypotheses were rejected. The Total Assets Value and the Asset Turnover ratio have negative relationship, while the Market Value of Equity has positive relations with the probability of the long run excess return (or return above the average market).

Table 1. Regression results between fundamental factors and the future stock returns

	Income Group												Balance Sheet Group								Cash Flow Group						
	PB	PEG	EP	EBIT	EG	EPS	PM	RDE	ROIC	SP	SGAGP	BVPS	PB	TA	NCAV	ROA	STA	CACL	DE	MVE	CFP	CFO	ROACF	DPS	DIVP	PAYOUT	DIVG
1-quarter 2010	-0.000622	4.00E-06	0.001947	5.12E-13	8.79E-05	-0.000641	-0.000369	7.74E-05	-0.001095	0.003225	-1.633453	-0.000329	-0.02066	-2.16E-10	4.07E-13	0.000335	0.030788	-8.39E-05	0.016966	4.57E-13	2.31E-11	6.94E-13	2.09E-05	-0.003503	0.04192	-0.007643	-0.003309
	0.5293	0.176	0.1781	0.1583	0.9105	0.218	0.3601	0.9025	0.2533	0.0745	0.1831	*0.0294	0.1949	0.5339	0.6739	0.7484	*0.0782	0.8798	*0.0999	*0.0634	0.5628	0.2093	0.7551	0.2197	0.1063	0.3576	0.4867
2-quarter 2010	-0.002574	1.21E-05	0.008527	-9.60E-13	0.000714	-0.000267	-0.002051	3.44E-03	-0.007876	0.006886	4.477854	-0.000542	-0.064243	-1.24E-09	-1.10E-13	-0.000525	0.053315	-2.26E-03	0.052269	1.29E-12	4.30E-11	7.42E-13	0.000194	-0.004572	0.071182	-0.01583	-0.003176
	0.2209	0.3635	0.3074	0.2198	0.9258	0.8461	0.2494	0.1287	**0.0235	0.1234	0.1345	0.1831	0.1884	0.2666	0.9695	0.8809	0.2783	*0.0536	0.2355	0.1012	0.6161	0.394	0.6969	0.3046	0.3046	0.276	0.6569
3-quarter 2010	-0.001549	2.06E-05	-0.008738	-5.43E-13	0.000649	0.000437	-0.001294	0.001104	-0.000463	0.004411	-2.777194	-0.000239	-0.060926	-1.65E-09	-5.42E-13	0.002241	0.028965	-0.003094	0.038111	1.65E-12	-3.64E-11	9.34E-13	3.61E-04	5.70E-04	0.084366	-0.009144	-0.011331
	0.4207	*0.0872	0.3396	0.5793	0.7565	0.7876	0.4646	0.5976	0.8968	0.2553	0.2863	0.727	***0.0022	0.3914	0.9134	0.5264	0.5001	0.3336	*0.0803	0.2272	0.6419	0.3661	***0.0062	0.9156	0.1846	0.5056	0.1397
1-year 2010	-0.002638	2.28E-05	0.005666	-8.01E-13	0.000312	-0.001765	-0.002761	0.003011	-0.002304	0.005068	-5.041281	-0.000795	-8.67E-02	-1.94E-09	-1.32E-13	0.003107	0.032914	-0.004141	9.34E-02	2.01E-12	2.25E-11	9.83E-13	5.41E-04	-5.40E-03	1.06E-01	-0.011741	-0.011439
	0.3173	0.2178	0.7897	0.5796	0.9128	0.4177	0.3757	0.4536	0.7417	0.3389	0.2753	0.1318	0.1022	0.2617	0.9772	0.4819	0.6328	*0.0843	0.3064	*0.0965	0.8463	0.54	0.5144	0.1606	0.6264	0.6264	0.4078
1.5-year 2010	-0.00692	2.28E-05	0.03359	-5.41E-12	0.000714	-0.00279	-0.005534	0.009884	-0.012528	0.008989	9.434627	-0.001243	-1.58E-01	4.51E-09	-3.47E-12	0.000386	0.032889	-0.006095	2.12E-01	3.10E-12	1.70E-11	-9.09E-13	1.04E-03	-8.11E-03	0.366574	-0.049174	-0.023788
	*0.0967	0.5685	0.5269	0.1318	0.8585	0.5777	0.332	0.3016	0.4383	0.1871	0.3321	0.1812	*0.0752	0.18	0.7071	0.9584	0.7755	0.1023	0.3723	0.1484	0.9104	0.5362	0.6969	0.4316	0.1606	*0.0976	*0.0615
2-year 2010	-0.01733	-2.75E-05	0.089595	-1.02E-11	0.005528	-0.01173	-0.009595	0.016034	-0.045363	0.020893	-20.7033	-0.003292	-2.58E-01	-6.30E-09	-4.60E-12	-0.019817	0.011919	-0.01011	3.90E-01	3.90E-12	-3.61E-12	-1.93E-12	8.06E-04	-5.45E-02	8.53E-01	-0.222662	-0.002266
	**0.0261	0.5745	0.3248	0.083	0.3976	0.0973	0.2852	0.2916	0.0823	0.0607	0.0243	0.023	0.0868	0.2385	0.7703	0.0972	0.9505	0.1149	0.3131	0.2122	0.9931	0.7374	0.2499	*0.0675	8.53E-01	**0.0106	0.9636
1-quarter 2011	2.77E-05	9.82E-06	-1.06E-02	-8.51E-13	-4.45E-03	3.22E-04	-1.03E-03	4.52E-05	4.92E-03	3.21E-09	-2.89E+00	-0.000163	-0.00687	-8.35E-10	-1.95E-12	0.003318	-0.003548	-0.00044	0.003481	2.15E-13	-2.14E-11	-4.36E-13	0.000194	-0.000744	0.007627	-0.002154	-0.007574
	0.7793	0.635	**0.0461	0.2117	0.1896	0.8148	*0.0454	0.8305	***0	0.5011	0.1551	0.4601	0.0972	*0.0544	*0.0888	***0.0001	0.7546	0.1044	0.1044	0.5065	0.0194	0.6434	***0.0071	0.4357	0.6969	***0.002	0.2014
2-quarter 2011	3.66E-05	2.49E-05	-3.17E-03	-2.65E-12	-6.39E-03	1.78E-03	-1.88E-03	-1.81E-04	5.12E-03	-1.37E-08	-3.78E+00	-0.000383	-0.025984	-1.75E-09	-3.28E-12	0.002387	-0.048901	-0.000652	0.00664	5.75E-13	8.23E-11	-1.24E-12	2.11E-04	-0.002617	0.06605	-0.00367	0.1198
	0.8509	0.5407	0.7607	0.1075	0.3383	0.5117	*0.0625	0.6633	***0.0061	0.1439	0.1785	0.583	*0.0471	0.2006	0.3634	0.3584	0.173	0.6469	0.3259	0.5729	0.4514	0.2666	0.1852	0.6101	0.1837	0.2458	0.1837
3-quarter 2011	6.19E-05	1.86E-05	0.007477	-4.10E-12	-0.010323	0.000582	-0.002282	-0.000769	0.004402	-1.58E-08	-5.481658	-0.000661	-0.041392	-2.47E-09	-4.56E-12	-0.001295	-0.071643	-0.000115	0.004386	8.02E-13	2.02E-10	-1.31E-12	-1.44E-05	-0.009594	0.138763	-0.00588	-0.041531
	0.8642	0.6101	0.6267	**0.0033	0.5335	0.8636	*0.054	0.31	0.1819	*0.0658	*0.0908	0.5614	0.0528	0.2686	0.4383	0.7602	0.2215	0.9605	0.691	0.6305	**0.0347	*0.0409	0.955	*0.0556	0.1298	*0.0069	*0.0891
1-year 2011	-0.000306	3.61E-05	0.014166	-6.22E-12	-0.005188	-0.004482	-0.005353	-0.002058	0.001899	3.13E-08	2.993764	-0.002324	-0.041318	-2.83E-09	-5.74E-12	-0.009916	-0.125403	-0.000765	0.008316	5.81E-13	4.30E-10	-1.27E-12	-0.000544	-0.030248	0.237496	-0.011574	-0.053709
	0.5106	0.4806	0.7427	***0.0118	0.6986	0.6947	*0.0003	0.2946	0.8339	0.2727	0.6659	***0.0004	*0.0792	*0.0685	0.166	0.2956	0.1043	0.3082	0.6158	0.5972	***0.0194	0.7168	0.2981	*0.0006	0.089	***0	0.3001
1.5-year 2011	-0.000446	4.54E-05	0.036291	-5.03E-12	-0.018796	0.000497	-0.004548	-0.00226	0.00112	2.11E-10	24.10421	-0.00149	-0.060554	4.62E-09	-9.62E-12	-0.008186	-0.116755	-0.001005	-0.001219	1.86E-12	5.94E-10	-2.72E-13	-0.00015	-0.001198	0.130735	-0.001628	0.008199
	0.3872	0.3614	0.1425	**0.0124	0.3703	0.5644	**0.0161	*0.0405	0.8331	0.9934	**0.0421	*0.0404	***0.0001	***0.0061	**0.0434	0.1705	*0.0833	0.1424	0.9011	0.133	*0.0262	0.2128	0.2981	0.1319	***0.0005	0.1945	0.1265
2-year 2011	-0.000331	4.21E-05	0.189284	-6.13E-12	-0.074293	-0.002451	-0.008771	0.005306	-0.001466	2.95E-08	13.08011	-0.001432	-0.083423	4.23E-09	-9.51E-12	-0.000869	-0.062631	-0.000236	0.017774	1.20E-12	6.24E-10	-7.73E-13	-0.000343	-0.023137	0.321036	-0.011599	-0.075397
	0.5326	0.4641	**0.0086	***0.0118	**0.0073	0.6947	***0.0003	0.0921	0.894	0.3666	0.1123	*0.0564	**0.0011	**0.0068	*0.0708	0.8994	0.4144	0.8013	0.4267	0.2888	***0.0005	0.4546	0.3638	*0.0106	*0.0087	0.1599	0.0549
1-quarter 2012	-0.000422	-3.02E-06	-0.002533	-1.24E-12	0.000497	2.37E-05	-0.001791	-0.000173	0.003996	-7.51E-09	0.614112	-0.000306	-0.015728	-1.17E-09	-2.89E-12	0.00115	-0.018482	-0.000502	0.005628	4.79E-13	1.03E-11	6.54E-14	3.27E-05	0.00473	0.122065	0.014762	0.006471
	**0.0124	0.2994	***0	*0.0639	0.3703	0.9679	**0.0003	0.75331	***0.017	**0.0418	0.5836	*0.0722	***0.0071	***0.0002	***0.0003	0.5687	0.2389	0.5565	0.6995	***0.0388	0.8621	0.8534	0.7374	0.3529	***0.0005	0.1296	0.6768
2-quarter 2012	-0.000216	3.35E-06	-0.004344	8.75E-13	-0.0004	0.001883	-0.00124	-0.000126	0.003718	9.38E-09	1.065608	0.000234	-0.019572	-1.33E-09	-2.64E-12	0.000979	-0.019132	-0.001287	-0.011106	1.00E-12	5.94E-10	-9.86E-13	-0.000322	-0.018872	0.109782	-0.009997	-0.05224
	0.3677	0.2668	***0	0.2444	0.7221	**0.0306	*0.0576	0.2829	**0.0132	***0.007	0.3687	0.2268	***0.0078	***0.0009	**0.0294	0.5447	0.2663	0.1082	0.3755	***0.0003	0.8534	0.7168	0.7374	0.1319	***0.0005	0.1945	0.6978
3-quarter 2012	-0.000228	6.15E-06	-0.004256	7.02E-13	-0.000692	0.00221	-0.0035	0.000462	0.004772	1.29E-08	-0.61382	7.04E-05	-0.030881	-1.46E-09	-2.79E-12	0.000843	-0.00091	-0.001364	0.000962	1.07E-12	6.77E-12	-7.27E-15	6.37E-05	0.002443	0.109782	0.015714	0.007293
	0.5108	0.1085	0.3007	0.5457	0.7369	***0.0325	***0	0.1733	**0.0057	0.5277	0.8392	0.7531	*0.0183	***0.0042	*0.0856	0.7531	0.9794	0.1933	0.9633	0.9132	0.8592	0.9852	0.5728	0.581	0.111	0.0173	0.6587
1-year 2012	-0.000166	8.45E-07	-0.007256	-1.06E-12	-0.000968	0.003291	-0.003056	0.000709	0.003709	2.65E-08	-1.567808	0.000158	-0.048066	-1.69E-09	-3.09E-12	0.000583	0.042686	-0.000576	-0.001039	1.14E-12	2.44E-11	-3.32E-13	4.63E-05	0.003926	0.131936	0.033208	-0.008554
	0.7543	0.8859	0.3619	0.5957	0.6986	***0.0413	**0.0138	0.2647	*0.089	0.4979	0.6056	0.5736	*0.0521	***0.0076	0.1115	0.8953	0.4827	0.6989	0.9729	***0.0088	0.9132	0.9852	0.6591	0.4447	***0.0007	0.0971	0.593
1.5-year 2012	-0.000805	-1.80E-05	-0.211856	-6.88E-12	-0.002949	0.004153	-0.003563	0.001728	0.004719	8.32E-08	-6.979423	-0.001327	-0.12612	-6.21E-09	-1.18E-11	-0.029488	0.194013	-0.006508	-0.012639	3.91E-12	7.93E-11	-4.10E-13	0.00013	-0.008532	0.446072	0.035877	-0.012786
	0.3624	0.248	***0	0.1908	0.5063	***0	***0	0.3262	0.4067	0.4279	0.2355	0.1898	0.0818	0.1108	0.1075	0.3964	0.349	0.3642	0.8867	0.1886	0.3703	0.4974	0.5311	*0.0941	0.122065	0.1296	0.6768
2-year 2012	-0.001551	-3.37E-05	-0.36697	-1.19E-11	-0.00032	0.003352	-0.008543	0.000684	0.010617	1.14E-07	-12.62167	-0.003141	-0.202143	-9.31E-09	-1.63E-11	-0.053123	0.214467	-0.010396	-0.009506	6.21E-12	1.00E-11	1.20E-12	-0.000262	-0.019717	0.411272	0.018386	0.026432
	0.1655	0.1111	***0	0.0912	0.9592	0.4731	*0.0761	0.7978	0.1675	0.4248	0.2231	*0.0773	0.0711	0.1575	0.1672	0.3659	0.509	0.383	0.9444	0.2201	***0.0003	0.2888	0.2888	0.1319	0.0173	0.026432	0.5855
1-quarter 2013	1.22E-05	2.63E-06	0.004474	-2.65E-13	-6.88E-05	-0.000862	0.000253	7.87E-05	-0.001021	-6.95E-10	4.011717	-0.000298	-0.004006	-1.25E-10	-1.67E-13	-0.000385	-0.025436	0.001541	0.000962	4.64E-14	1.76E-11	1.40E-13	3.78E-05	-0.006176	0.15941	0.000603	-0.007715
	0.4011	***0.0091	0.5907	0.2751	0.9528	0.1927	0.5071	0.9828	0.5562	0.9136	0.4159	***0.0102	0.2213	0.4017	0.7012	0.6696	**0.0001	0.2051	0.288	0.6957	0.7486	0.4968	0.9059	0.9941	0.1323	0.5279	*0.0443
2-quarter 2013	1.28E-05	5.33E-06	-0.327418	-1.55E-12	0.002255	0.000139	0.001081	-0.000271	-0.002483	-4.97E-09	5.853241	-0.001187	-0.019214	-8.23E-10	-1.04E-12	-0.015482	-0.059596	0.000158	0.006327	8.20E-13	1.36E-10	-6.75E-15	5.87E-05	-0.015052	0.254652	-0.000287	-0.017144
	0.2512	**0.0138	***0	0.0726	0.4373	0.9521	0.2821	0.7687	0.5624	0.5434	0.3393	***0.0008	*0.0142	0.3222	0.4848	0.2759	***0.0098	0.9493	0.7044	0.4076	0.3509	0.989	0.6386	***0.0001	***0.0001	***0	***0.0656
3-quarter 2013	-1.48E-05	5.45E-06	-0.653162	-3.07E-12	0.00561	0.000305	0.000153	-0.002576	0.002684	2.00E-08	-7.571039	-0.002073	-0.048644	-1.62E-09	-1.80E-13	-0.033745	-0.066977	0.002569	0.002389	2.34E-12	3.32E-10	6.18E-15	8.58E-05	-0.019798	0.197569	-0.002222	-0.032659
	0.5496	0.1629	*0.0071	0.0744	0.3202	0.9151	*0.0761	0.4927	0.8445	0.5301	0.6231	***0.0033	*0.0263	0.3484	0.9549	0.22448	0.1183	0.5833	0.5034	0.2405	0.2195	0.9941	0.6066	***0.0001	***0.0016	0.1826	***0.0071
1-year 2013	5.24E-05	8.21E-07	-0.591731	-3.96E-12	0.004925	-0.00475	3.87E-05	-0.004771	0.011625	3.44E-08	-13.25579	-0.002625	-0.080613	-1.59E-09	7.76E-12	-0.027508	-0.093379	0.003234	0.072446	2.41E-12	6.87E-10	-8.02E-13	0.000124	-0.029739	0.202861	-0.001447	-0.055157
	0.5032	0.8702	***0	*0.0683	0.5641	0.2751	0.9828	0.4086	0.5453	0.4478	0.3259	***0.0019	**0.007	0.3771	0.8371	0.2783	0.151	0.578	0.2438	0.2223	*0.0969	0.4706	0.6427	***0	0.202861	0.5602	***0.0028
1.5-year 2013	7.55E-05	2.69E-06	-0.218935	-3.99E-12	-0.00577	-0.002262	-0.00016	-0.002836	0.011776	1.52E-08	-8.270759	-0.001288	-0.073379	-1.43E-09	-3.37E-13	-0.008831	0.046567	0.002945	0.059167	1.63E-12	3.66E-10	-1.04E-12	9.72E-05	-0.024772	0.363465	-0.002809	-0.064733
	0.1714	0.5906	**0.0138	*0.031	0.2786	0.4677	0.907	0.4797	0.3991	0.4476	0.2687	***0.0001	*0.007	0.3222	0.8898	0.3846	0.2945	0.5041	0.1126	0.1099	0.2545	0.3131	0.7251	***0.0007	***0.0007	***0	0.0002
2-year 2013	5.04E-05	5.12E-06	-0.127912	-4.79E-12	-0.00583	0.000679	0.001226	-0.00077	0.007365	1.15E-08	-9.95243	-0.000384	-0.071863	-1.24E-09	-6.02E-13	-0.000808	0.079119	0.001371	0.040892	1.13E-12	3.63E-10	-1.57E-12	2.47E-05	-0.024621	0.653948	-0.005998	-0.074204
	0.4855	0.2555	**0.0198	**0.0112	0.3283	0.8285	0.234	0.7781	0.5033	0.37	*0.0515	0.3623	*0.0004	0.1109	0.7594	0.9113	0.3516	0.5886	*0.0897	0.1719	0.5291	0.5291	0.9418	0.0554	*0.0018	0.2832	0.002

Note: The above numbers are the estiamted regression coefficients and the below numbers represent their v-values.; *, **, *** = significance at 10%, 5%, and 1% respectively

Table 2. Logit regression results between fundamental factors and the future stock returns

		Income Group											Balance Sheet Group										Cash Flow Group						
		PE	PEG	EP	EBIT	EG	EPS	PM	ROE	ROIC	SP	SGAGP	BVPS	PB	TA	NCAV	ROA	STA	CACL	DE	MVE	CFP	CFO	ROACF	DPS	DIVP	PAYOUT	DVG
1-quarter 2010	coef	-4.83E-03	8.55E-05	5.28E-02	3.96E-12	0.016723	-0.007954	-1.02E-02	5.25E-03	-0.004198	0.025939	23.19407	-3.45E-03	-8.55E-02	-6.39E-09	5.02E-12	5.21E-03	0.151655	-2.42E-03	9.78E-02	8.81E-12	1.05E-09	9.25E-12	3.01E-04	-2.91E-02	6.66E-02	-0.135525	-2.86E-02
	p	0.5226	0.4619	0.5572	0.7209	0.4387	0.5226	0.1241	0.4107	0.8154	*0.0472	0.1659	0.2293	0.275	0.3915	0.7835	0.6736	0.2957	0.8505	0.2971	*0.0926	0.184	0.3714	0.8069	0.6085	0.8853	0.4459	0.7779
2-quarter 2010	coef	7.71E-04	7.93E-05	1.25E-01	-7.48E-12	3.79E-02	0.000148	-2.66E-03	3.47E-04	-0.02269	0.007408	-13.17914	-1.15E-03	-6.68E-02	-1.53E-09	1.03E-11	-7.76E-03	0.180662	-1.78E-02	1.25E-01	2.81E-12	3.07E-10	6.36E-12	-2.49E-04	-2.58E-02	3.21E-01	-0.051041	-1.03E-01
	p	0.9127	0.5086	0.4037	0.54	0.1881	0.9909	0.6788	0.9542	0.2138	0.5113	0.451	0.6215	0.3346	0.8327	0.5534	0.5101	0.2074	0.3914	0.1827	0.5607	0.6613	0.5192	0.8286	0.4949	0.726	0.4218	0.3456
3-quarter 2010	coef	5.26E-03	3.54E-04	-9.27E-02	-1.38E-11	2.45E-02	0.001457	-2.93E-04	-1.60E-03	0.01368	-0.002554	-7.826705	-4.57E-04	-1.12E-01	-7.44E-09	-6.69E-12	1.14E-02	0.142154	-1.77E-02	-1.49E-01	4.35E-12	5.95E-11	-7.29E-13	2.79E-03	-2.84E-02	1.16E+00	-0.057498	-1.24E+01
	p	0.4798	0.1279	0.4275	0.3311	0.2354	0.9119	0.9643	0.7865	0.4264	0.8237	0.6053	0.8392	0.1644	0.3343	0.7079	0.3452	0.3214	0.3943	0.1505	0.3794	0.932	0.9395	*0.0204	0.578	0.1109	0.698	0.2559
1-year 2010	coef	-2.16E-03	3.43E-04	-5.14E-02	-9.58E-12	1.95E-02	-0.004249	-5.21E-03	5.58E-03	0.027878	0.0141	29.88948	-1.95E-03	-1.02E-01	-6.03E-09	-5.74E-12	2.71E-02	0.159436	-8.29E-03	-1.20E-02	3.42E-12	4.18E-10	3.94E-13	2.95E-03	-3.90E-02	2.86E-01	-0.015222	-2.99E-02
	p	0.7772	0.1189	0.3336	0.4761	0.3589	0.7496	0.4271	0.3513	*0.0971	0.259	0.099	0.417	0.2055	0.426	0.741	*0.0352	0.2668	0.6161	0.869	0.4852	0.5529	0.9676	*0.0154	0.451	0.5329	0.9172	0.7438
1.5-year 2010	coef	-1.49E-02	9.75E-06	-4.96E-02	-1.17E-11	3.25E-02	0.002157	-4.60E-03	5.67E-03	0.022259	0.037113	-32.01833	-1.30E-03	-1.23E-01	-1.12E-08	-6.09E-12	2.23E-02	-0.171923	-3.13E-02	-3.61E-02	5.56E-12	-5.29E-11	-8.95E-13	2.36E-03	2.10E-02	1.18E+00	-0.25555	-1.27E-01
	p	*0.0606	0.9329	0.3822	0.3985	0.2231	0.8666	0.4849	0.3527	0.1901	0.1833	0.106	0.5675	0.1264	0.2094	0.7363	*0.067	0.1345	0.1465	0.6259	0.3049	0.9389	0.9248	*0.0471	0.2661	0.9233	0.2661	0.1981
2-year 2010	coef	-2.11E-02	-2.17E-05	-1.33E-02	-1.98E-11	1.55E-02	0.001503	2.22E-03	4.30E-03	-0.009836	0.032004	8.458595	-1.26E-03	-1.31E-01	-1.73E-08	-8.84E-12	-1.52E-03	-0.418015	-1.85E-02	5.32E-02	7.72E-12	4.83E-10	-3.75E-12	2.29E-03	-6.41E-02	1.24E+00	-0.377462	8.85E-02
	p	**0.0161	0.8513	0.7501	0.2277	0.2967	0.9071	0.726	0.4482	0.5395	**0.0175	0.5627	0.5748	0.0904	0.0647	0.635	0.8976	0.49	0.2549	0.1693	0.1693	0.5528	0.6954	*0.0556	0.2152	0.1202	0.1127	0.3653
1-quarter 2011	coef	0.000372	0.00018	-0.10708	-8.19E-12	-0.065267	0.025778	-0.007466	0.001091	0.04632	-1.48E-08	-39.91426	-0.00181	-0.096591	-1.98E-08	-2.50E-11	0.054625	-0.173878	-0.074466	0.043059	1.13E-11	5.24E-10	-5.74E-12	0.003291	-0.003247	0.459663	-0.022989	0.050935
	p	0.7576	0.4962	0.4421	*0.0987	0.1559	0.2066	0.251	0.7789	0.4244	**0.0096	0.3348	0.523	0.1345	**0.0317	0.1465	***0.0001	0.2285	*0.0931	0.1934	0.069	0.5059	0.4653	***0.0034	0.9233	0.2661	0.4218	0.583
2-quarter 2011	coef	-0.0001	0.000222	-0.111923	-1.48E-11	-0.055147	0.017719	-0.001068	0.001601	0.029238	-1.37E-07	-19.26484	-0.000401	-0.160021	-3.05E-08	-3.60E-11	0.035657	-0.46447	-0.042988	0.033216	1.37E-11	6.88E-10	-6.19E-12	0.000964	-0.010404	0.50259	-0.029628	-0.045016
	p	0.9313	0.4004	0.2395	0.241	0.2148	0.3683	0.8625	0.648	*0.0484	0.1343	0.4502	0.8771	**0.0233	*0.0028	*0.0549	***0.0034	*0.0033	0.1214	0.3813	*0.021	0.3644	0.4195	0.3606	0.7557	0.2682	0.2758	0.6217
3-quarter 2011	coef	-0.000271	0.000218	-0.020127	-1.79E-11	-0.008286	0.01505	-0.005604	-0.001452	0.012544	-5.22E-08	6.274063	-0.002184	-0.125339	-2.67E-08	-2.50E-11	0.012447	-0.474677	0.002626	0.008142	1.39E-11	8.58E-10	-9.31E-12	0.000291	-0.01424	0.87525	-0.036594	-0.127298
	p	0.82	0.4041	0.7599	0.1717	0.8415	0.4313	0.4313	0.6178	0.3494	0.3732	0.8009	0.4039	*0.0365	*0.0038	0.1506	0.2121	*0.0016	0.7253	0.7821	*0.0167	0.2684	0.2652	0.7851	0.6741	0.1536	0.2126	0.1684
1-year 2011	coef	-0.001548	0.000254	-0.03437	-2.69E-11	-0.083375	0.005085	0.00109	-0.002604	0.00363	2.61E-09	31.49592	-0.004807	-0.040625	-1.46E-08	-1.51E-11	0.004457	-0.504968	0.001488	0.029425	2.51E-12	4.18E-10	-9.65E-12	-0.001674	-0.041173	0.700382	-0.035992	-0.181954
	p	0.276	0.3349	0.6116	*0.0987	0.1163	0.7773	0.8662	0.4403	0.7867	0.9663	0.3348	*0.0876	0.4153	*0.0617	0.3433	0.6483	***0.0007	0.8342	0.4761	0.5612	0.1298	0.2731	0.7851	0.2396	0.2067	0.1814	*0.055
1.5-year 2011	coef	-0.0005	-0.000155	0.194851	-1.90E-11	-0.086732	0.015559	-0.003252	-0.01254	0.027406	-5.16E-08	34.71469	0.0018	-0.067316	-2.19E-08	-2.57E-11	0.005953	-0.416143	0.002935	-0.001192	9.83E-12	2.07E-09	-9.66E-12	-0.000466	0.040109	0.643301	-0.028086	-0.044836
	p	0.6799	0.5697	0.1505	0.22	0.1214	0.3832	0.6278	*0.0422	0.125	0.3735	0.2572	0.501	0.2031	*0.0098	0.1163	0.5323	*0.0049	0.6809	0.9623	*0.0488	*0.0375	0.2454	0.6584	0.1986	0.2396	0.2694	0.6276
2-year 2011	coef	0.000918	-0.000102	0.332944	-1.11E-11	-0.068726	0.012664	-0.00024	-0.006074	-0.007142	-4.588E-08	49.63971	0.001826	-0.159097	-3.31E-08	-4.18E-11	-0.011711	-0.307288	0.004841	0.002255	1.74E-11	3.00E-09	-6.70E-12	-0.00139	0.023353	1.6584	-0.021905	-0.101409
	p	0.4605	0.6929	0.1015	0.3477	0.2087	0.4684	0.9718	0.236	0.611	0.4302	0.1628	0.5051	*0.0185	***0.0007	*0.0205	0.2364	*0.0319	0.6109	0.9383	***0.0039	*0.0119	0.6578	0.1965	0.5187	*0.0454	0.336	0.2786
1-quarter 2012	coef	-0.002252	3.77E-05	-0.025162	-5.12E-11	0.006052	0.020035	-0.003524	-0.001103	0.020496	4.85E-08	17.27756	-0.000692	-0.137483	-3.78E-08	-7.05E-11	0.023677	-0.523937	0.006116	0.098231	9.46E-12	-1.44E-10	-6.70E-12	-0.001929	-0.016529	1.227511	-0.011102	0.103679
	p	0.5128	0.5882	0.6371	0.2255	0.3188	0.7886	0.8527	0.4869	0.1163	0.1789	0.5123	0.6004	*0.0212	**0.0097	***0.0015	*0.0732	*0.0097	0.448	0.6243	*0.0077	0.9269	0.3376	0.103	0.6523	0.1368	0.9241	0.7298
2-quarter 2012	coef	-0.001448	-8.11E-05	-0.015765	-5.00E-12	0.004343	0.073604	-0.006426	-0.001927	0.010351	-2.11E-07	11.18592	0.005893	-0.100014	-1.02E-08	-1.92E-11	0.001722	-0.328712	-0.008765	-0.097973	9.41E-12	9.25E-10	1.65E-13	-0.000644	0.081775	1.288043	0.219551	0.054363
	p	0.5912	0.6172	0.1948	0.7163	0.8081	***0.0047	0.2452	0.2901	0.3433	*0.0672	0.5337	*0.0327	0.1896	*0.0446	0.1528	0.8628	0.2809	0.5624	0.2863	*0.024	0.2981	0.9809	0.5184	*0.0685	0.1212	0.1313	0.7194
3-quarter 2012	coef	0.001218	9.20E-05	-0.013291	-4.57E-12	-0.001914	0.034967	-0.006748	0.001175	0.007186	-1.17E-07	11.83318	0.004634	-0.116775	-1.48E-08	-2.25E-11	-0.004883	-0.160693	-0.008805	-0.084301	9.27E-12	4.85E-10	-6.64E-12	0.000217	0.03479	1.337442	0.29684	-0.006997
	p	0.6157	0.6929	0.2822	0.7307	0.8981	*0.0826	0.2211	0.5464	0.4794	0.1789	0.5123	*0.0695	0.1272	*0.0303	0.1413	0.6203	0.3352	0.5443	0.3311	*0.0202	0.3948	0.5639	0.8253	0.3689	0.1106	0.9684	0.9631
1-year 2012	coef	0.000374	5.56E-05	-0.01417	-3.97E-12	-0.003438	0.041598	-0.011162	0.00154	0.011562	-1.55E-07	13.59685	0.007176	-0.151779	-1.53E-08	-2.38E-11	-0.005463	-0.095661	-0.008979	-0.106457	1.05E-11	7.69E-10	-9.46E-12	0.000538	0.071883	1.00844	0.279319	-0.052328
	p	0.8777	0.5215	0.266	0.7652	0.8168	*0.0533	*0.0756	0.4905	0.2661	0.1068	0.5099	*0.0182	*0.0585	*0.0156	0.1051	0.5751	0.5585	0.533	0.2235	*0.0105	0.3894	0.2343	0.583	0.1047	0.1999	*0.0796	0.73
1.5-year 2012	coef	-0.000673	0.000132	-0.005575	7.75E-12	-0.063676	-0.003496	-0.005669	-0.001114	-0.014499	-1.23E-07	8.463276	-0.001238	-0.375644	-2.53E-08	-1.92E-11	-0.022931	-0.328712	-0.017524	-0.046908	1.34E-11	6.62E-10	-1.18E-12	-0.000678	-0.013818	1.108499	0.142749	0.191113
	p	0.7809	0.4392	0.6583	*0.0987	0.0659	0.7722	0.3565	0.5666	0.2297	*0.0832	0.6515	0.6171	***0.0002	*0.0012	0.1528	*0.0349	0.0564	0.3339	0.59	***0.001	0.4227	0.8634	0.4889	0.7069	0.1482	0.2738	0.2051
2-year 2012	coef	0.001634	0.000117	-0.008816	-1.88E-11	-0.021805	-0.003307	-0.000986	-0.001648	-0.007106	2.29E-08	9.265778	-0.001285	-0.185316	-1.94E-08	-2.24E-11	-0.018521	-0.384182	0.015607	0.042608	1.04E-11	7.51E-11	-8.39E-12	-0.002657	-0.019188	1.379548	0.268017	-0.05193
	p	0.5128	0.9208	0.2822	*0.0336	0.3188	0.4322	0.8527	0.4322	0.4869	0.6968	0.5997	0.6004	0.053	*0.0732	0.1762	*0.0732	***0.003	0.448	0.6243	0.1179	0.9269	0.103	*0.011	0.6061	0.1106	0.403	0.3922
1-quarter 2013	coef	0.000127	6.39E-05	0.028597	9.02E-12	0.011936	-0.041098	-0.004309	0.005639	-0.010471	-1.65E-08	28.70585	-0.005575	-0.006452	-7.84E-09	4.96E-09	0.004758	-0.395881	0.002797	0.019494	5.08E-12	-3.76E-10	3.42E-12	0.001551	-0.037581	1.51911	0.010913	-0.050155
	p	0.6578	0.3208	0.647	0.3162	0.6088	0.1662	*0.0501	0.2661	0.5572	0.7844	0.8294	*0.0575	0.8557	0.1223	0.1634	0.6329	*0.0158	0.7794	0.6622	0.185	0.7497	0.6586	0.1469	0.3711	0.1159	0.6199	0.5161
2-quarter 2013	coef	0.000148	7.23E-05	0.026003	-4.69E-12	0.014234	-0.032701	0.000368	0.003179	-0.035098	4.24E-08	9.703411	-0.007558	-0.036515	-1.55E-09	-8.98E-13	-0.002172	-0.514505	0.009433	0.091975	-1.89E-12	1.77E-09	1.60E-12	-5.17E-05	-0.072018	1.82452	-0.015907	-0.1422
	p	0.6114	0.3204	0.6809	0.6689	0.2922	***0.0047	0.9381	0.3756	*0.0484	0.4939	0.7484	*0.0264	0.3261	0.7509	0.9274	0.8391	0.2809	0.5562	0.1608	0.6114	0.2981	0.8429	0.9617	0.1224	0.1212	0.4561	0.12
3-quarter 2013	coef	0.000127	9.06E-05	0.01328	-6.24E-12	0.011936	-0.041098	-0.000872	0.003852	-0.033992	3.66E-08	6.47005	-0.006882	-0.077314	-3.91E-09	2.39E-14	-0.006653	-0.283075	0.010467	0.085059	-2.89E-12	3.01E-09	1.69E-12	-0.000529	-0.093264	1.28279	-0.020476	-0.068087
	p	0.6227	0.3162	0.8326	0.5572	0.6088	0.1662	0.8671	0.2963	0.4869	0.5664	0.8294	***0.0336	0.0763	0.4586	0.9981	0.5502	*0.0677	0.5265	0.1179	0.4102	0.1945	0.8354	0.0636	0.0745	0.1507	0.6253	0.3922
1-year 2013	coef	0.000143	3.87E-05	-0.028169	-2.94E-11	-0.007687	-0.023538	-0.00172	0.003749	-0.023808	3.665E-08	-11.23821	-0.00588	-0.153679	-1.42E-08	-1.10E-11	-0.008683	-0.324717	0.009386	0.118797	1.45E-12	4.50E-09	1.69E-12	-0.000303	-0.087744	1.375495	-0.023785	-0.130622
	p	0.5908	0.5064	0.6617	*0.0587	0.7504	0.1922	0.7423	0.3153	0.1712	0.5664	0.2261	*0.0538	**0.0121	*0.0103	0.2988	*0.0336	*0.0423	0.543	0.0532	0.7374	0.1945	0.8354	0.7802	*0.0745	0.1507	0.3929	0.153
1.5-year 2013	coef	0.000156	3.87E-05	-0.050692	-3.34E-11	0.008962	0.036736	0.020633	0.002383	0.009557	2.39E-08	5.483349	-0.000809	-0.134152	-5.13E-09	-2.61E-12	0.010508	-0.108995	0.005157	0.083369	1.12E-11	1.69E-12	-7.62E-12	0.001469	-0.011155	1.229992	-0.020499	-0.170643
	p	0.5908	0.5064	0.4335	*0.0232	0.7234	*0.0716	*0.0261	0.3691	0.5722	0.698	0.8545	0.7263	*0.018	*0.0103	0.2988	0.3781	0.4242	0.5157	0.1182	*0.013	0.2594	0.3781	0.1707	0.7839	0.1897	0.4195	0.12
2-year 2013	coef	0.00013	3.18E-05	-0.050692	-3.34E-11	0.008962	0.036736	0.020633	0.002383	-0.027428	2.68E-09	-80.16427	0.004997	-0.137985	-5.13E-09	-2.61E-12	0.010508	-0.124296	0.010817	0.094529	3.75E-12	4.50E-09	-1.90E-11	-0.001432	0.040438	1.297297	-0.018328	-0.214021
	p	0.6497	0.5738	0.4335	*0.0232	0.7234	*0.0716	*0.0261	0.4184	0.1381	0.9654	*0.0708	0.1011	*0.0164	0.2074	0.7734	0.324	0.3687	0.4659	*0.0837	0.2574	*0.033	0.0921	0.1959	0.3532	0.2034	0.5141	**0.0322

Note: The above numbers are the estiamted regression coefficients and the below numbers represent their p-values; *, **, *** = significance at 10%, 5%, and 1% respectively

Table 3. Groups Analysis Table showing the ranked future portfolio returns from the sorted values of the selected fundamental factors

	Year 2010						Year 2011						Year 2012						Year 2013					
	1-q	2-q	3-q	1-yr	1.5-yr	2-yr	1-q	2-q	3-q	1-yr	1.5-yr	2-yr	1-q	2-q	3-q	1-yr	1.5-yr	2-yr	1-q	2-q	3-q	1-yr	1.5-yr	2-yr
Low PE	3	5	5	5	5	5	1	3	3	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
	1	1	1	1	4	3	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	5
	4	3	3	3	3	2	4	5	5	3	3	3	2	1	1	2	1	1	2	2	2	1	1	2
	2	2	2	2	1	1	2	1	1	1	2	1	3	3	3	1	2	2	1	1	1	2	2	1
High PE	5	4	4	4	2	4	3	2	2	2	1	2	1	2	2	3	3	3	3	3	3	3	3	3
Low PEG	1	1	3	2	2	3	2	2	1	1	1	1	2	3	3	3	2	2	1	1	1	1	1	1
	5	5	5	5	5	5	1	1	3	3	3	3	4	2	1	1	3	3	3	3	3	3	3	2
	4	4	1	1	3	4	4	5	5	5	5	4	5	5	4	4	5	5	5	5	5	5	5	5
	3	2	2	3	1	2	3	3	4	4	4	5	3	1	5	5	4	4	4	4	4	4	4	4
High PEG	2	3	4	4	4	1	5	4	2	2	2	2	1	4	2	2	1	1	2	2	2	2	2	3
Low EP	1	3	3	4	4	4	1	2	3	3	4	4	4	3	3	3	5	5	4	5	5	5	4	4
	5	4	4	3	2	3	3	3	2	2	1	2	1	4	4	4	3	3	1	1	1	3	2	2
	2	1	1	1	1	1	2	1	1	1	2	1	3	2	2	2	2	2	3	3	3	2	3	3
	4	2	2	2	3	2	4	5	5	4	3	3	2	1	1	1	1	1	2	2	2	1	1	1
High EP	3	5	5	5	5	5	5	4	4	5	5	5	5	5	5	5	4	4	5	4	4	4	5	5
Low ROE	4	4	4	4	4	4	1	5	5	5	5	5	4	2	4	4	5	5	5	5	5	5	5	5
	2	2	2	2	2	1	2	1	2	2	2	2	1	5	3	3	3	3	1	1	3	4	3	2
	1	1	1	1	1	2	3	2	3	3	3	3	3	4	2	2	2	2	2	3	4	3	4	3
	3	3	3	3	3	3	5	4	4	4	4	4	2	1	1	1	1	1	3	2	1	1	2	4
High ROE	5	5	5	5	5	5	4	2	1	1	1	1	5	3	5	5	4	4	4	4	2	2	1	1
Low PB	5	5	5	5	5	5	3	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	4	3	2	3	3	4	1	2	4	4	4	3	4	4	4	4	3	3	4	4	4	4	4	4
	2	4	4	4	4	3	2	3	2	3	3	4	2	3	3	3	4	4	1	2	2	2	2	2
	1	1	1	1	2	2	5	4	3	2	2	2	1	1	1	2	2	2	3	3	3	3	3	3
High PB	3	2	3	2	1	1	4	1	1	1	1	1	3	2	2	1	1	1	2	1	1	1	1	1
Low TA	3	4	4	4	4	4	4	5	5	5	5	5	4	5	5	5	5	5	5	5	5	5	5	5
	5	5	5	5	5	5	5	4	4	4	4	4	3	3	3	4	4	4	2	4	4	4	4	3
	2	2	1	2	2	3	1	2	2	2	2	2	5	4	4	3	3	3	1	1	3	3	3	4
	1	1	2	1	1	1	3	3	3	3	3	3	2	1	1	2	2	2	4	3	2	2	2	2
High TA	4	3	3	3	3	2	2	1	1	1	1	1	1	2	2	1	1	1	3	2	1	1	1	1
Low MVE	5	5	5	5	5	5	3	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	2	1	2	3	2	3	1	3	3	4	4	4	4	4	4	4	4	4	3	4	4	4	4	2
	4	3	3	2	4	4	5	4	4	3	3	3	3	3	2	2	3	3	4	3	3	3	3	3
	1	2	1	1	1	1	2	2	1	1	1	1	2	1	1	1	1	2	2	2	2	2	2	4
High MVE	3	4	4	4	3	2	4	1	2	2	2	2	1	2	3	3	2	1	1	1	1	1	1	1
Low CFP	4	2	1	2	1	2	1	1	1	4	4	3	2	1	2	3	3	4	4	4	4	4	4	4
	1	1	2	1	2	1	4	3	2	2	1	2	3	3	1	2	1	1	1	2	2	2	2	2
	2	3	4	3	4	3	3	4	5	1	2	4	1	4	5	5	4	3	2	1	1	1	1	1
	3	4	3	5	5	5	5	5	4	3	3	1	4	5	3	1	2	2	3	3	3	3	3	3
High CFP	5	5	5	4	3	4	2	2	3	5	5	5	5	2	4	4	5	5	5	5	5	5	5	5
Low CFO	2	2	1	1	1	3	1	1	2	2	2	1	4	1	1	1	1	3	4	3	3	3	3	2
	3	3	4	4	4	4	3	5	5	5	5	5	5	5	5	4	5	5	3	5	5	5	5	4
	5	5	5	5	5	5	4	4	4	3	4	4	2	2	4	5	4	4	5	4	4	4	4	5
	1	1	2	2	2	2	5	3	3	4	3	3	3	4	2	2	2	1	1	1	1	1	1	1
High CFO	4	4	3	3	3	1	2	2	1	1	1	2	1	3	3	3	3	2	2	2	2	2	2	3
Low DPS	5	5	5	5	5	5	1	1	4	4	4	5	5	1	5	5	5	5	5	5	5	5	5	4
	3	1	1	1	3	4	5	5	5	5	5	4	4	4	3	3	4	4	4	4	4	4	4	5
	4	3	2	2	2	3	4	4	3	3	3	3	3	3	2	1	1	3	1	3	3	3	3	3
	2	4	3	3	1	1	3	2	1	2	1	1	1	2	1	2	2	1	3	2	1	1	1	1
High DPS	1	2	4	4	4	2	2	3	2	1	2	2	2	5	4	4	3	2	2	1	2	2	2	2
Low PAYOUT	5	5	5	5	5	5	1	3	4	4	4	4	4	1	3	1	5	5	3	5	5	5	4	3
	4	3	1	1	2	2	3	5	5	5	5	5	5	4	5	5	4	4	5	4	4	4	5	5
	3	4	4	4	3	3	5	2	2	2	2	2	1	2	1	2	3	3	4	3	3	3	3	4
	2	2	3	3	4	4	4	4	3	3	1	1	3	3	2	3	2	2	2	2	2	1	2	2
High PAYOUT	1	1	2	2	1	1	2	1	1	1	3	3	2	5	4	4	1	1	1	1	1	2	1	1

Note: 5 to 1 represent the ranked future returns of the portfolio. 5 represents the portfolio with the highest average return, and 1 represents the portfolio with the lowest return

Another interesting factor is the Price to Book ratio, which still has the negative but moderate relationship in the long term. Other factors, except the Price to Earnings to Growth ratio and the Earnings Yield, have weak relationships.

Table 3 shows the results from groups analysis of some selected factors which have interesting patterns. The research also separates those factors into 4 groups based on their patterns. The first group includes the Price to Earnings ratio, the Price to Book ratio, the Total Assets Value, the Dividend per Share, and the Dividend Payout ratio. In average, the portfolios that contain stocks with low value of those factors tend to give higher returns than other portfolios. The portfolios of stocks with high value of the Cash Flow Yield, classified in the second group, tends to generate high returns. The Price to Earnings to Growth ratio and the Operating Cash Flow are in the third group. High future returns come from the portfolios with moderate values (or the value closed to the market average) of these two factors. Portfolios of stocks with too high or too low Price to Earnings to Growth ratio or Operating Cash Flow could generate lower returns. The last group refers to the Earnings Yield and the

Return on Equity. The portfolio with extreme values (relatively high or low compared with the market average) of those factors generate high future returns and that is totally opposite to the third group factors.

Some factors, such as the Price to Book ratio and the Total Assets Value, seems to give the similar outcomes as the previous regression tests. Interestingly, factors, such as the Earnings Yield, also gives additional information which is different from the logit test, and many factors that got the good results from the groups analysis do not get the strong results from the previous tests.

5. Discussion and Conclusion

In this study, there are some fundamental factors reveal the different results from some previous studies. For examples, the factors of the Earnings Yield and the Profit Margin show significantly negative relations to the returns in the regression analysis, however, the findings of Jaffe, Keim and Westerfield (1989); Keim (1990); Wu and Wang (2000); Salomons (2006); and Meesuwan (2015) found the inverse relations between those factors.

Nevertheless, there are some results in this study show the similar findings to the

previous studies as Oppenheimer (1986); Capaul, Rowley and Sharpe (1993); and Jensen, Johnson and Mercer (1997) who found the negative relations between the factors of the Price to Book ratio and the Dividend per Share to the future returns. Similarly, the result of a positive relation between the Dividend Yield and the returns in this study is the same as Wu and Wang (2000); Visscher and Filbeck (2003); and Aras and Yilmaz (2008).

Theoretically, although the Earnings before Interest and Tax, the Return on Invested Capital, and the Book Value per Share indicated positive relations to the returns (Fraser and Ormiston, 2010; Graham, 2003; and Jean-Jacques, 2003), this study found that the Return on Invested Capital shows the same relation to the returns as the supported theory, but the Earnings before Interest and Tax and Book Value per Share factors reveals the negative relations to the returns. That may be explained by the effects from Subprime crisis, European crisis, and high political risk in Thailand during the test period. Sales, revenues, earning, and assets of several good performance companies in Thailand significantly decreased in the short run. This also links to

the abnormal results of some factors in the logit and groups analysis.

According to the logit regression analysis, stocks with low value of Total Assets have more probability to generate returns higher than the market returns. However, the previous studies gave the various results such as Khatab, Masood, Zaman, Saleem and Saeed (2011); Pervan and Višić (2012); Khan (2012); Doğan (2013); and Hatem (2014). While the low value of Asset Turnover ratio and the high value of Market Value of Equity can explain the higher returns, as well as the previous researches of Sharma and Preeti (2009); and Chan et al. (1991).

Meanwhile, some factors such as the Price to Book ratio and the Total Assets value, shows significant relationship with returns in the regression, logit and groups analysis, but there are some factors that show unclear relationship to the future returns such as the Price to Earnings to Growth ratio, the Operating Cash Flow, the Earnings Yield, and the Return on Equity. They show interesting patterns in the groups analysis, such as the average value of the Price to Earnings to Growth ratio, and the Operating Cash Flow can generate high future

returns. Moreover, the portfolio with extreme values of the Earnings Yield and the Return on Equity can also generate higher future returns. These abnormal patterns may also be explained by the continuous effects from crises with other external factors, for examples, selling stocks of many foreign investors, temporary drops in earnings of good companies, inflation, decreasing in interest rate, government policies, etc.

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