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Value Investing: Circle of Competence in the Thai Insurance Industry

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Value Investing: Circle of Competence in the Thai Insurance Industry

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Abstract

This study explores the strategy of value investing, specifically for the insurance industry in Thailand. It employs multiple measures of "value," suitable for insurance companies, such as the price-to-earning (PE), price-to-book (PB), and cyclically adjusted price-to-earnings (CAPE). Value premium exists in the Thai insurance industry. Most of the value portfolios constructed from these measures significantly outperform the market, even when adjusting for price volatility and portfolio's β. The cumulative returns are also higher for the value stocks, when compared to the growth stocks, and the Thai stock market. Constructing a value portfolio, using the PE ratio, results in the highest returns and are far better than PB and CAPE. The value anomaly cannot be fully explained by either the capital asset pricing model or the Fama-French 3 factor models.

Keywords: Value Investing; Portfolio Management; Circle of Competence; Risk Management; Insurance; Property&Liability Insurance; Life Insurance.

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1 Introduction

Value investing has been popular among institutional and individual investors in Thailand. The idea is originally from Dodd and Graham (1951) and Graham (2003). Various studies, such as Basu (1977), Fama and French (1992, 1993, 1996, 1998, 2006, 2012, 2015), Piotroski (2000), Piotroski and So (2012), Asness, Moskowitz, and Pedersen (2013), Asness, Frazzini, Israel, and Moskowitz (2015), and Novy-Marx (2013, 2015), find that value portfolios outperform growth portfolios. Value stocks are defined as either having a low price-to-book ratio, or a low price-to-earning ratio. Growth stocks are defined as either having high a PB ratio, or a high PE ratio.

Notable value investors also claim that the value investor does not have to know or understand every company in the market. Investors might be able to implement value investing using some companies or some industries that they truly understand. The notion of a circle of competence has been introduced by Warren Buffett and Charlie Munger, two of the most successful value investors, which means that investors should focus their efforts in the circle of knowledge that they have. They do not need to invest in companies or industries that they do not understand. For example, in a 1996 letter to shareholders of Berkshire Hathaway, Buffett stated:

> *"Should you choose, however, to construct your own portfolio, there are a few thoughts worth remembering. Intelligent investing is not complex, though that is far from saying that it is easy. What an investor needs is the ability to correctly evaluate selected businesses. Note that word 'selected': You don't have to be an expert on every company, or even many. You only have to be able to evaluate companies within your circle of competence. The size of that circle is not very important; knowing its boundaries, however, is vital*[1]*."*

In the same spirit as Warren Buffett, Andrew Carnegie, one of the world's wealthiest mag-

[1]See the 1996 Warren Buffett's Letter to Berkshire Shareholders of Berkshire Hathaway Inc.

nates in history also emphasized the importance of staying within the circle of competence by saying:

> *"My advice to young men would be not only to concentrate their whole time and attention on the one business in life in which they engage, but to put every dollar of their capital into it. If there be any business that will not bear extension, the true policy is to invest the surplus in first-class security which will yield a moderate but certain revenue if some other growing business cannot be found. As for myself my decision was taken early. I would concentrate upon the manufacture of iron and steel and be master in that*[2]*."*

Is it true that by focusing on a particular industry, investors can beat the market in the long term? This study explores the performance of value portfolio construction from stocks only in the Thai insurance industry using hand-collected data from the Stock Exchange of Thailand. This study is different from the previous traditional value studies in the following ways. First, it studies value investing in only a specific sector, namely the Thai insurance industry. By studying only one sector, it has the benefit of using a more proper and effective way to identify value stocks. In addition, it eliminates heterogeneity among different industries when ranking stocks based on their value measures. As each sector experiences different growth prospectives and cycles, and illustrates unlike characteristics, using a particular measure across all sectors seems to be inappropriate to identify value stocks. In addition, this study differentiates from other value premium studies because the insurance industry is a unique sector. The construction of the balance sheet and the earnings statement are quite different from other industries. Therefore, the study needed to take a more careful approach when analyzing the value of investing in the insurance industry by offering various measurements of value.

More specifically, I used PB as a measure of value. Many value investing gurus claim that it is the most appropriate way to measure the intrinsic value of an insurance company.

[2]Carnegie (2012)

As the balance sheet of an insurance company consists of financial assets and liabilities, the book value is the remainder of assets and liabilities that belong to equity owners. The PB measure is similar to previous "value" studies. In addition, I also used price-to-earnings ratio, similar to Basu (1977) to capture the value stocks. I also used the cyclically adjusted price-to-earnings (CAPE), similar to Campbell and Shiller (1988). This is due to the fact that the earnings of an insurance company in a single year might affect the way we pick value stocks. For example, an insurance company might have one particular bad year, due to a catastrophic event, and the event might create much lower earnings than the true earning power of the company. The company might also be a good underwriter over a long period of time. We can call this kind of company, "good but unlucky." Therefore, this might result in a negative PE ratio for a catastrophic year. If we use only a PE ratio to capture the value stock, some insurers might be eliminated from the analysis. Hence, average earnings might result in a more appropriate measure of a value stock.

The results are in line with other studies. Constructing value portfolios based on PB, PE, and CAPE3[3] outperform both the market portfolios and the growth portfolios. However, using CAPE5[4] does not result in value premium. Adjusting for volatility yields the same results. This implies that CAPM does not fully capture the value premium, similar to Fama and French (2006)'s results. In addition, the Fama-French 3 factor model does not capture the value anomaly. This might be due to the fact that the number of stocks in each portfolio is small. Therefore, the dispersion from non-systematic risks (the sample variance of ϵs is too high to be explained by the market returns). It dominates systematic risk which is represented by β. Therefore, there is no apparent relationship between the returns of the value portfolio and the Fama-French factors. Overall, investors can outperform the market, even adjusting for the price risks, by applying a value investing strategy in the Thai insurance industry. However, investors must choose an appropriate value measure to construct the insurance value portfolio.

[3]CAPE3 is cyclically adjusted price-to-earnings ratio based on three-year earnings.
[4]CAPE5 is cyclically adjusted price-to-earnings ratio based on five-year earnings.

This study proceeds as follows. Section II explores related theories and empirical findings about value investing. Section III outlines the portfolio construction procedures and how I collected the data. Section IV reports the performance of various portfolios when compared to the market. Section V uses CAPM to explain the value anomaly in the Thai insurance industry. Section VI attempts to explain the anomaly using the Fama-French 3 factor model. Lastly, I conclude the study by discussing the implications of my findings, and I give some further recommendations for future researches.

2 Related Theories and Empirical Findings

Benjamin Graham is the father of value investing. In his famous books, including Dodd and Graham (1951), and Graham (2003), he proposes a value strategy for investing. He states that investors can outperform the general market by constructing a portfolio consisting of a low price-to-book ratio or a low price-to-earnings ratio. By using this strategy, investors have what Benjamin Graham calls margins of safety, which means that the price is below the intrinsic value of the business. Many prominent investors have sucessfully followed this unique strategy, such as Warren Buffett, Charlie Munger, Irvin Kahn, Walter Schloss, Joel Greenblatt, Christopher Browne, Seth Klarman, and Martin Whitman. For instance, Frazzini, Kabiller, and Pedersen (2013) find that Berkshire Hathaway outperforms any stocks and mutual funds using Sharpe's ratio criteria. This is due to the combination of value, safe, quality investing, plus leverage. In addition to the success of the superinvestors from Graham-and-Doddsville[5], researchers also find evidence that value portfolios outperform the market portfolios and "growth" portfolios.

Fama and French (1992, 1993, 1998, 2006, 2015) also discover that portfolios of value stocks with a low PB, tend to outperform the market. There are doubts that the capital asset pricing model can capture the anomalies in the stock returns. For example, Fama

[5]Buffett, Warren (2004). "The Superinvestors of Graham-and-Doddsville" Hermes: the Columbia Business School Magazine: 415.

and French (2006) also find that value stocks outperform the market, but CAPM does not capture the value premium. In addition to stocks, Asness, Moskowitz, and Pedersen (2013) find that value premium exists through many other asset classes.

Focusing on Thai stock market, Sareewiwatthana (2011, 2012, 2013), in line with Fama and French (1992, 1993, 1998, 2006, 2015), find that portfolios consisting of value stocks significantly outperform the market. Sareewiwatthana (2011) uses various measures, such as PB, PE, and dividend yield to pick value stocks. The study ranks them in order to form value portfolios and defines the low PB, PE, and dividend yield to be value stocks. The study finds that value portfolios significantly outperformed the SET index. Sareewiwatthana (2012) combines growth and the price-to-earnings ratio to form a PEG ratio to capture the value stocks. The study constructs a portfolio a low PEG ratio and finds that it outperforms the market and also a high-PEG portfolio. Sareewiwatthana (2013) implements Sareewiwatthana (2012) by adding the other ratios, such as return of equity (ROE) and return on asset (ROA). Adding these ratios help value portfolios to outperform the market even better. Overall, the evidence suggests that value investing outperforms the market in the Stock Exchange of Thailand.

Value anomaly can be explained by both a rational and behavioral argument. According to the model in Sharpe (1964), higher (lower) risk stocks should have higher (lower) expected return. Value stocks occur because investors require higher than expected returns from riskier stocks. In the other words, investors get higher return due to investing in distressed and risky companies. Therefore, the investors gets higher than average returns due to the fact that they have to bear more risk in the portfolio. For example, Fama and French (1995) show that lower PB stocks tend to be in a distressed situation and tend to provide a low return on equity. On the other hand, the behavioral finance literatures explains that value stocks happen as a result of human's behavior. For example, investors overreacting to news about a company can result in the stock prices being much lower than their fundamental value, according to Bondt and Thaler (1985), Lakonishok, Shleifer, and Vishny (1994), and Daniel,

Hirshleifer, and Subrahmanyam (1998). Noise traders and arbitrageurs can also create the situation where the price and the fundamental value are diverged, according to Shleifer and Vishny (1997). A classic statement that explains the value premium from both schools of thought is from Dodd and Graham (1951):

> *"In other words, the market is not a weighing machine, on which the value of each issue is recorded by an exact and impersonal mechanism, in accordance with its specific qualities. Rather should we say that the market is a voting machine, whereon countless individuals register choices which are the product partly of reason and partly of emotion."*

This statement implies that value investing works because in the short term, stock prices can deviate from their fundamental value. However, over the long term, the price can reflect the intrinsic value. The price can get to be very close or at the true fundamental value. It is the job of value investors to find and get the benefit of this anomaly by buying securities when the price and value are deviated, and then waiting until the prices to go back to the intrinsic value in the long term.

3 Portfolio Construction and Data Collection

This study uses the Stock Exchange of Thailand dataset from January of 1990 until December of 2014, that is available from the SETSMART database. To test whether value stocks outperform the general market, I constructed portfolios of stocks using the following criteria. First, I constructed portfolios of insurance companies using the price-to-book ratio. Second, I constructed portfolios using the price-to-earnings ratio. Third, I used the cyclically adjusted price-to-earnings ratio. I used all property and casualty, and life insurers within the Thai stock market to test my hypothesis.

3.1 Value Portfolio from PB Ratio

For each year, the portfolios rebalance in the beginning of January. For PB, I constructed two portfolios by ordering the PB ratios of all insurers[6]. I then constructed the LOW PB portfolio, consisting of the lowest quartile of stocks with the lowest PB ratios. There were 18 insurers listed in the most recent data. Therefore, one quartile consists of 4.5 companies, which I rounded down to 4 companies. Returns with the adjusted dividend of the portfolio for each month will be collected. As the data does not provide the exact date of the dividend, I used the dividend yield divided by 12 and added it to the price return to adjust for the total return. The proportion of each position was equally weighted. I also constructed the HIGH PB portfolio to capture the growth stocks. This is the same as the LOW PB portfolio, except the portfolio picks the highest quartile of PB. The two portfolios were compared to the SET-index portfolio with adjusted dividend.

3.2 Value Portfolio from PE Ratio

I constructed the value portfolio using the PE ratio[7]. For each year, the portfolio was rebalanced in the beginning of January. I constructed two portfolios by ordering the PE ratios of each insurer. The negative value stocks are not considered in constructing the value portfolio. I constructed the LOW PE portfolio, consisting of the lowest quartile of stocks with the lowest PE ratios. The proportion of each position was equally weighted. Returns, including the dividend of the portfolio, for each month were collected. The available period of PE portfolios are different from PB portfolios due to the fact that SETSMART does not have earnings per share until 1997. Therefore, the analysis of the PE portfolio starts in the beginning of 1998. I also constructed the HIGH PB portfolio to capture the growth stocks.

[6]The PB ratio is defined as price per share divided by book value per share.

[7]PE ratio is defined as price per share divided by earning per share. PE is thought to be a better measure of value as it takes return on equity (ROE) into consideration. Since, $PE = \frac{price}{EPS}$, hence $PE = \frac{price}{book} * \frac{book}{EPS}$. This is the same as writing $PE = \frac{PB}{ROE}$. A higher PB increases PE if ROE stays constant. On the other hand, a higher ROE lowers the PE ratio if PB stays constant. Therefore, PE is superior to PB in the sense that it captures both ROE and PB at the same time. However, PB is superior to PE because assets are more stable than earnings.

This is the same as the LOW PE portfolio, except the portfolio picks the highest quartile of PE. The two portfolios were compared to the SET-index portfolio and adjusted with the dividend.

3.3 Value Portfolio from Cyclically Adjusted Price-to-Earnings Ratio

Insurer's earnings are different from other businesses. According to Cummins, Weiss, and Zi (1999) and Nettayanun (2014), there are three main operations within an insurance company. First, it pools and bears underwriting risks. Second, it serves its customers through servicing, related to the incurred loss. Third, it gets some other earnings from the investment of the insurance float, which is the premium that the insurer collects and waits to be paid in the future. The first component can be quite volatile due to catastrophe loss. For example, there was a great flood in Thailand in 2011. Most of the insurers faced underwriting losses. Using a regular PE ratio might not give a complete view of the value of the insurers. Therefore, it might be better to capture value stock via the cyclically adjusted price-to-earnings ratio. The ratio averages the earnings in multiple years, according to Campbell and Shiller (1988). Basically, it is the price divided by average earnings adjusted by inflation for 10 years.

Particularly,

$$CAPE = \frac{price_{current}}{(eps^*_{t-1} + eps^*_{t-2} + \cdots + eps^*_{t-10})/10} \tag{1}$$

where eps^*_i is earnings adjusted by the inflation rate to the current period from year i. The inflation rates for each year are from the Bank of Thailand[8]. In this study, I used three and five years, instead of 10 years, of CAPE to construct my portfolio due to the fact that I could only start my analysis in 2002 as earnings can be found starting in 1997. Using 10 years of CAPE resulted in very short time frame to test the portfolio performance, from

[8]See www.bot.or.th/Thai/Statistics/Graph/Pages/Main3.aspx

2007 to 2014, which might not be sufficient to show value premium. I called it CAPE3, CAPE5 for CAPE, using an average of three and five years, respectively. I constructed two portfolios by ordering the CAPE3 of each insurer. The negative value of CAPE3 stocks were not considered in constructing the value portfolio. I constructed the LOW CAPE3 portfolio consisting of the lowest quartile of stocks with the lowest CAPE3 ratios. The proportion of each position were equally weighted. Returns, including the dividend of the portfolio, were collected for each month. I also constructed the HIGH CAPE3 portfolio to capture the growth stocks. This is the same as the LOW CAPE3 portfolio except that the portfolio picks the highest quartile of CAPE3. I repeated the same exercise for CAPE5. All portfolios were compared to the SET-index portfolio adjusted with dividend.

4 Results

The results of the simulated portfolios from various measures will be discussed in detail. First, I explain the results from the portfolio ordering of the PB ratios. Second, I show the results of the portfolio construction using the PE ratio. The performance of the last two portfolios use CAPE3 and CAPE5, respectively.

4.1 Portfolios Constructed from Price per Book Ratio

According to the table, 1, the portfolio that consisted of low PB stocks, outperformed the portfolio consisting of high PB stocks, based on the monthly arithmetic average, the annual geometric average, and the monthly excess average of returns. The low PB portfolio achieved 1.52% arithmetic average return compared to 0.91% of the high PB portfolio. The low PB stocks give 14.04% geometric average returns per year compared to 5.65% of the high PB stocks. However, the low PB stocks have lower minimum monthly returns(-30.62%) than the high PB stocks(-22.33%). In addition, low PB stocks have a maximum return(74.55%) higher than the high PB stocks(46.54%). This can be interpreted as follows. On average,

low PB stocks have higher average returns than high PB stocks. However, low PB stocks have wider ranges of returns than the high PB stocks. As expected, the volatility of low PB stocks is higher than the high PB stocks. This is the prediction following the CAPM. Higher volatility leads to higher expected returns of the portfolio.

Table 1: Portfolios Constructed from Price-to-Book Ratio

	LOW PB	**SET**	**HIGH PB**
Min (per month)	−30.62%	−29.59%	−22.33%
Max (per month)	74.55%	33.23%	46.54%
Arithematic Average (per month)	1.52%	0.84%	0.91%
Geometric Average (per year)	14.04%	8.20%	5.65%
Volatility (per month)	10.14%	8.97%	7.64%
$VaR_{95\%}$ (per month)	−8.27%	−9.57%	−6.46%
Average $(R_i - R_f)$ (per month)	1.29%	0.61%	0.68%
Sharpe Ratio (per month)	12.75%	6.82%	8.90%
β to SET	−4.50%		4.25%
Cumulative Return of 1 Baht	23.39	6.62	3.74

Note: This table shows information resulting from the construction of portfolios sorting the price-to-book ratio. The portfolios were rebalanced in the beginning of January every year. The first LOW PB column represents the portfolio constructed from the first quartile of PB ratios. The second column, SET, is the market portfolio with the dividend reinvested. The third column, HIGH PB, represents the last quartile of PB ratios. The table shows all statistics from each portfolio. Volatility is the standard deviation of the monthly returns of each portfolio. $VaR_{95\%}$ is the first five percentile of the monthly returns. The Sharpe ratio is defined as $\frac{r_p - r_f}{\sigma_p}$. Beta of the portfolio is calculated from $\beta_p = \frac{COV(r_p, r_m)}{\sigma_p^2}$. r_p is the per-month-return of the portfolio p. r_f is the return of risk-free interest rate per month. σ_p is the volatility of portfolio p.

Adjusting for volatility, low PB stocks have a return of 12.75% compareding to 8.90% of high PB stocks. β from the low PB stocks is -4.50% versus 4.25% for the high PB stocks. In magnitude, low PB stocks tends to have a bigger absolute value of β than high PB stocks. Low PB stocks tend to be more volatile than high PB stocks. This might be explained using a distress situation like Fama and French (1995). Low PB stocks tends to be more distressed than high PB stocks. Therefore, investors requires higher than expected returns for low PB stocks than the high PB stocks. The cumulative return of the low PB portfolio outperforms both the market portfolio and the high PB portfolio. The low PB portfolio achieves 23.39 times over 24 years, whereas, the market and the high PB portfolio get 6.62 times and 3.74 times, respectively. In addition, we can see the accumulation over time of

the low PB portfolio, the high PB portfolio and the market portfolio in figure 1.

Overall, the results are in line with previous studies. There exists a value premium, not only across all stocks, but also in the insurance industry in particular. CAPM seems to be able to explain this value premium in the Thai insurance industry. Even though the low PB ratio has a higher averaged return, but investors face higher volatility of holding these stocks. The portfolio of low PB stocks have a deeper worst month than the high PB stocks. On the other hand, the low PB stocks have the best returns in a single month. However, low PB insurer's stocks cumulatively outperform the high PB insurers' stocks by a wide margin.

4.2 Portfolios Constructed from Price-to-Earning Ratio

The following is the result of the portfolios' returns constructed from the price-to-earnings (PE) ratio. According to the table, 2, the portfolio consists of stocks with low PE outperforming the portfolio that consists of high PE, based on the monthly arithematic average, the annual geometric average, and the monthly excess average. The low PE portfolio achieves 3.15% arithematic average compared to 0.96% of the high PE portfolio. Low PE stocks give 41.21% geometric average per year compared to 10.03% of the high PE stocks. The difference on the geometric average is very wide. The low PE portfolio has the worst return for each month(-21.51%) compared to the high PE stocks(-20.77%). In addition, low PE stocks have a much higher maximum monthly return (68.11%) higher than the high PE stocks(38.18%). To summarize, on average, low PE stocks tend to have a higher average than high PE stocks. During the bad months, the two portfolios seem to have similar returns. However, the low PE ratio portfolio has a high return during the best month.

Table 2: Portfolios Constructed from Price-to-Earning Ratio

	LOW PE	**SET**	**HIGH PE**
Min (per month)	−21.51%	−29.59%	−20.77%
Max (per month)	68.11%	33.23%	38.18%
Arithematic Average (per month)	3.15%	1.29%	0.96%
Geometric Average (per year)	41.21%	12.70%	10.03%
Volatility (per month)	9.73%	8.38%	6.51%
$VaR_{95\%}$ (per month)	−4.96%	−8.19%	−6.34%
Average $(R_i - R_f)$ (per month)	3.04%	1.18%	0.84%
Sharpe Ratio (per month)	31.26%	14.06%	12.97%
β to SET	5.43%		1.73%
Cumulative Return of 1 Baht	250.06	6.77	4.62

Note: This table shows information resulting from the construction of portfolios from sorting the price-to-earnings ratio. The portfolios are rebalanced every January. The first LOW PE column represents the first quartile of PE ratios. The second column, SET is the market portfolio including dividend reinvested. The third column, HIGH PE represents the last quartile of PE ratios. The table shows all statistics from each portfolio. Volatility is the standard deviation of the monthly returns of each portfolio. $VaR_{95\%}$ is the first five percentile of the monthly returns. Sharpe ratio is defined as $\frac{\overline{r_p - r_f}}{\sigma_p}$. Beta of the portfolio is calculated from $\beta_p = \frac{COV(r_p, r_m)}{\sigma_p^2}$. r_p is the per-month-return of the portfolio p. r_f is the return of risk-free interest rate per month. σ_p is the volatility of portfolio p.

Adjusting for volatility, low PE stocks have a volatility of 9.73% compared to 6.51% for the high PE stocks. β derived from the low PE stocks is 5.43% versus 1.73% for the high PE stocks. This is in line with the volatility of each portfolio. Low PE stocks tend to be more volatile than high PE stocks. This is in line with the results constructed using PB ratios. In addition, the low PE stock portfolio has a higher $VaR_{95\%}$, which indicates less than 95% confidence that the risk of loss in return for a particular month of the low PE portfolio is lower than the high PE portfolio, and the market portfolio. Therefore, these results cannot be fully explained by reasoning that higher price risk should be compensated by higher expected return.

The cumulative return of the low PE portfolio outperforms both the market portfolio and the high PE portfolio. The low PE ratio achieves 250.06 times over 16 years. The market and the high PE portfolio get 6.77 times and 4.62 times, respectively. In addition, figure 2 illustrates the cumulative return and the movement pattern of the low PE portfolio, the high PE portfolio, and the market portfolio.

Overall, the results are in line with previous studies that show a value premium in the Thai insurance industry. Although value premium can be explained by having higher volatility in stock prices, it cannot be explained from the perspective of the minimum return and the value at risk. However, low PE stocks in the insurance industry outperform the high PE stocks by a wide margin in terms of cumulative returns over a period of 16 years[9].

4.3 Portfolios Constructed from Three Year Cyclically Adjusted Price-to-Earnings Ratio

The following are the results from portfolios constructed from the three year cyclically adjusted price-to-earnings ratio. According to the table, 3, a portfolio consisting of stocks with a low level of CAPE3 outperforms a portfolio consisting of high CAPE3, based on the monthly arithmetic average, the annual geometric average, and the excess average. The Low CAPE3 portfolio achieves a 2.31% arithmetic average compared to 1.42% for the high CAPE3 portfolio. Low CAPE3 stocks give a 28.31% geometric average per year versus 16.83% for high CAPE3 stocks. The low CAPE3 portfolio has the worst return (-34.14%) for each month and is lower than the high CAPE3 stocks(-22.96%). In addition, low CAPE3 stocks have a much higher best monthly return (59.64%) than the high CAPE3 stocks(33.68%).

[9]The data of earnings for each stock started in 1997, Therefore, there are only about 16 years to accumulate returns. This is different from the PB case. The PB ratios have been available since 1990. There are 24 years for portfolio construction in the PB case.

Table 3: Portfolios Constructed from Three Year Cyclically Adjusted Price-to-Earnings Ratio

	LOW CAPE3	**SET**	**HIGH CAPE3**
Min (per month)	−34.14%	−29.59%	−22.96%
Max (per month)	59.64%	23.74%	33.68%
Arithematic Average (per month)	2.31%	1.15%	1.42%
Geometric Average (per year)	28.31%	12.30%	16.83%
Volatility (per month)	8.90%	6.96%	6.50%
$VaR_{95\%}$ (per month)	−4.55%	−7.49%	−5.18%
Average $(R_i - R_f)$ (per month)	2.23%	1.07%	1.34%
Sharpe Ratio (per month)	25.01%	15.43%	20.61%
β to SET	−1.71%		3.25%
Cumulative Return of 1 Baht	32.78	5.07	8.82

Note: This table shows information resulting from the construction of portfolios by sorting the three year cyclically adjusted price-to-earnings ratio. The portfolios are rebalanced every January. The first LOW CAPE3 column represents the first quartile of CAPE3 ratios. The second column, SET is the market portfolio, including dividends reinvested. The third column, HIGH CAPE3 represents the last quartile of CAPE3 ratios. The table shows all statistics from each portfolio. Volatility is the standard deviation of the monthly returns of each portfolio. $VaR_{95\%}$ is the first five percentile of the monthly returns. Sharpe ratio is defined as $\frac{\overline{r_p - r_f}}{\sigma_p}$. Beta of the portfolio is calculated from $\beta_p = \frac{COV(r_p, r_m)}{\sigma_p^2}$. r_p is the per-month-return of the portfolio p. r_f is the return from risk-free interest rate per month. σ_p is the volatility of portfolio p.

Adjusting for volatility, low CAPE3 stocks have a volatility of 8.90% versus 6.50% for high CAPE3 stocks. β from the low PE stocks is -1.71% and 3.25% for the high CAPE3 stocks. This is in line with the volatility of each portfolio. Even though the volatility of the Low CAPE3 stocks is higher than the high CAPE3, the β result is the reverse. This implies that the price risk does not quite explain the value premium when we use CAPE3. The low CAPE3 portfolio outperforms the high CAPE3 under Sharpe ratio. Therefore, the result that higher price risk should be compensated by a higher than expected return cannot be fully explained by the CAPM.

The cumulative return of the low CAPE3 portfolio outperforms both the market portfolio and the high CAPE3 portfolio. The low PE portfolio achieves 32.78 times over 14 years, whereas, the market and the high CAPE3 portfolios achieve 5.07 times and 8.82 times, respectively. In addition, figure 3 illustrates the cumulative return and the movement pattern of the low CAPE3 portfolio, the high CAPE3 portfolio, and the market portfolio.

Overall, there is a value premium as a result of using CAPE3, although the value premium

can be explained by having higher volatility in stock prices. In addition, using the Sharpe ratio, the low CAPE3 stocks still outperform the high CAPE3. Interestingly, both the low and high CAPE3 stocks outperform the market as a whole. This is due to the fact that the insurance industry outperforms the market as a whole during the period used. The setback of this result is due to the shorter time period as we lose about three years of data for averaging the lagged earnings. The results would be more reliable if there were a longer time period.

4.4 Portfolios Constructed from Five Year Cyclically Adjusted Price-to-Earnings Ratio

These are the results from the portfolios constructed from the five year cyclically adjusted price-to-earning ratio (CAPE5). According to the table 4, a portfolio consisting of stocks with a low level of CAPE5, underperforms the portfolio consisting of high CAPE5, based on the monthly arithmetic average, the annual geometric average, and the excess average. Low CAPE5 portfolio achieves a 2.18% arithmetic average compared to 2.27% for the high CAPE5 portfolio. Low CAPE5 stocks give 27.17% geometric average per year compared to 30.47% for the high CAPE5 stocks. The low CAPE5 portfolio has the worst monthly return of -26.21%, which is lower than the high CAPE5 stocks(-14.97%). However, the low CAPE5 portfolio has a higher maximum return (49.11%) than the high CAPE5 stocks(30.32%).

Table 4: Portfolios Constructed from Five Year Cyclically Adjusted Price-to-Earnings Ratio

	LOW CAPE5	**SET**	**HIGH CAPE5**
Min (per month)	−26.21%	−29.59%	−14.97%
Max (per month)	49.11%	19.68%	30.32%
Arithematic Average (per month)	2.18%	1.52%	2.27%
Geometric Average (per year)	27.17%	18.62%	30.47%
Volatility (per month)	8.27%	6.26%	6.51%
$VaR_{95\%}$ (per month)	−4.37%	−6.40%	−4.56%
Average $(R_i - R_f)$ (per month)	2.12%	1.46%	2.20%
Sharpe Ratio (per month)	25.57%	23.32%	33.83%
β to SET	−0.01%		7.46%
Cumulative Return of 1 Baht	17.89	7.76	24.34

Note: This table shows information resulting from the simulation of portfolios by sorting the five year cyclically adjusted price-to-earnings ratio. The portfolios are rebalanced every January. The first, LOW CAPE5, column represents the first quartile of CAPE5 stocks. The second column, SET is the market portfolio return, including dividend reinvested. The third column, HIGH CAPE5, represents the last quartile of CAPE5 stocks. The table shows all statistics from each portfolio. Volatility is the standard deviation of the monthly returns for each portfolio. $VaR_{95\%}$ is the first five percentile of the monthly returns. Sharpe ratio is defined as $\frac{\overline{r_p - r_f}}{\sigma_p}$. Beta of the portfolio is calculated from $\beta_p = \frac{COV(r_p, r_m)}{\sigma_p^2}$. r_p is the per-month-return of the portfolio p. r_f is the return of risk-free interest rate per month. σ_p is the volatility of portfolio p.

Volatility of the low CAPE5 is higher than the high CAPE5, although β of the low CAPE5 stocks is lower than the high CAPE5 in absolute terms. The low CAPE5 stocks underperform in both Sharpe ratio and cumulative return. Hence, there is no value premium using the CAPE5 measure. The author also checked the result with CAPE10, using the 10 year average and saw a similar result. One explanation of this result might be due to the underwriting standard of insurance companies. Using the long-term average of earnings, might not reflect the true fundamental value, either going forward or currently embedded in the insurer. Therefore, using earnings data that go too far back in time does not represent the true underlying earning power of the Thai insurance firms. Figure 4 shows the cumulative returns from the low CAPE5, the high CAPE5, and the market portfolios.

4.5 All Measures

Figure 5 shows the cumulative returns of various value portfolios constructed from different value measures. The time frame starts in 2002 because CAPE5 was available since that year.

All of the value measures outperform the returns of the Thai stock market. According to the figure, the PE ratio outperforms other value measures. Low PB ratio is the worst among various measures but still outperforms the market. Therefore, using a low PE ratio might give the best indicator of value among insurer stocks.

5 Can Value Premium Be Explained by CAPM?

According to the capital asset pricing model (CAPM), higher expectations of returns compensate for higher risk. CAPM uses the price's β to measure the risk of each stock. Value stocks result in higher average returns. Therefore, we should expect to observe higher β for the value portfolio. However, researchers have found the opposite. For example, Fama and French (2006) find that CAPM fails to capture value premium. In this section, I explore whether CAPM can fully capture value premium.

In order to explore the relationship between value premium and CAPM, I fit the following model.

$$R_p(t) - R_f(t) = \alpha + \beta_M[R_{SET}(t) - R_f(t)] + \epsilon(t). \tag{2}$$

The excess returns on the left-hand side of equation 2 are regressed on the excess returns of the Stock Exchange of Thailand returns including dividend. The risk-free rates $R_f(t)$ are obtained from the Bank of Thailand's website. According to table 5, CAPM does not fully explain the value premium. The CAPM αs are all positive and significant for the low PB, low PE, and the low CAPE3 that exhibit value premium, as discussed in the previous sections. In addition, there is a mixed result suggesting that value portfolios should have higher βs than the growth portfolios. Using PB and CAPE3 measures, βs in the value portfolios are smaller than the growth portfolios. However, using PE as a measure, the growth portfolio has lower β than the value portfolio. Therefore, if volatility of portfolio is the measure for

risk, we cannot conclude that the value portfolio achieves higher returns than the growth portfolio due to risk. The R^2's are also low in all the cases. Therefore, market excess returns do a poor job in explaining the portfolios' excess returns.

Table 5: CAPM Using SET Index

Portfolio	α	β_{SET}	R^2	F-Stat	P-Val	Obs	Year
LOW PB	1.32 **	−0.04	0.0013	0.3904	0.5326	298	1990-2014
	[2.24]	[−0.63]					
HIGH PB	0.65	0.05	0.0030	0.8878	0.3468	298	1990-2014
	[1.47]	[0.94]					
LOW PE	2.98 ***	0.05	0.0022	0.4388	0.5085	203	1998-2014
	[4.33]	[0.66]					
HIGH PE	0.82 *	0.02	0.0006	0.1270	0.7220	203	1998-2014
	[1.78]	[0.36]					
LOW CAPE3	2.24 ***	−0.02	0.0002	0.0269	0.8700	179	2000-2014
	[3.33]	[−0.16]					
HIGH CAPE3	1.30 ***	0.03	0.2459	0.2459	0.6206	179	2000-2014
	[0.49]	[0.07]					

Note: This table shows information resulting from OLS regressions of the value portfolio excess returns, constructed from PB, PE and CAPE3, based on SET market index excess returns, including dividends. LOW PB is the portfolio containing the lowest quartile of PB. HIGH PB is the portfolio containing stocks with the highest quartile of PB. LOW PE is the portfolio consisting of stocks with the lowest quartile of PE. HIGH PE is a portfolio consisting of stocks with the highest quartile of PE. LOW CAPE3 is a portfolio that contains the lowest quartile of CAPE3 stocks. Lastly, HIGH CAPE3 is a portfolio containing high CAPE3 stocks. α column represents the constant coefficients from all OLS regressions. β_{SET} is the column that contains the coefficients of the SET index excess returns, including dividend. R^2 is the column that represents the R^2 value of each regression. $F-Stat$ is the value of the F-statistics to test whether the β_{SET} should be zero. $P-Val$ is the column that represents the p-value from the F-test. *Obs* is the observation column that represents the number of observations in each particular regression. Year is the column to represent the year for which data was used, due to the availability of PB, PE and CAPE3. The numbers in square brackets are the t-statistics to test whether each coefficient is significantly different from zero. $*$,$**$, and $***$ represent the significant levels of 0.10, 0.05, and 0.01, respectively, from the t-tests.

Table 6 is the same as table 5 except I use Asia market returns instead of the SET index's returns. Asia market returns and Asia risk-free rates are from Kenneth French's website. Again, CAPM does not fully explain the value premium. All the α's of the value portfolios are positive and significant. Value portfolios have higher βs than the growth portfolios in absolute terms and in all cases. Therefore, using the Asia market index to capture the portfolio returns has the same results as implied by CAPM. However, R^2's are low for all the cases similar to the previous case when I used SET index returns. Therefore, Asian market index excess returns doe a poor job in explaining the portfolios' excess returns.

Table 6: CAPM Using Asia Market Index

Portfolio	α	β_{Asia}	R^2	F-Stat	P-Val	Obs	Year
LOW PB	1.36 **	−0.06	0.0012	0.3540	0.5523	293	1990-2014
	2.27	−0.60					
HIGH PB	0.52	0.04	0.0009	0.2732	0.6016	293	1990-2014
	1.23	0.52					
LOW PE	3.06 ***	−0.11	0.0049	0.9901	0.3209	203	1998-2014
	4.45	−1.00					
HIGH PE	0.81 *	−0.05	0.0019	0.3934	0.5312	203	1998-2014
	1.76	−0.63					
LOW CAPE3	2.26 ***	−0.15	0.0108	1.9360	0.1658	179	2000-2014
	3.39	−1.39					
HIGH CAPE3	1.22 ***	0.06	0.0031	0.5458	0.4610	179	2000-2014
	2.50	0.74					

Note: This table shows information resulting from OLS regressions of value portfolio excess returns, constructed from PB, PE and CAPE3, based on the Asia market index excess returns from Kenneth Frenchs website. LOW PB is the portfolio containing the lowest quartile of PB. HIGH PB is a portfolio containing stocks with the highest quartile of PB. LOW PE is the portfolio consisting of stocks with the lowest quartile of PE. HIGH PE is a portfolio consisting of stocks with the highest quartile of PE. LOW CAPE3 is a portfolio that contains the lowest quartile of CAPE3 stocks. Lastly, HIGH CAPE3 is a portfolio containing high CAPE3 stocks. The α column represents the constant coefficients from all OLS regressions. β_{Asia} is a column that contains the coefficients of the Asia market excess returns. R^2 is the column that represents the R^2 value of each regression. $F-Stat$ is the value of the F-statistics to test whether the β_{Asia} should be zero. $P-Val$ is the column that represents the p-value from the F-test. *Obs* is the observation column that represents the number of observations in each particular regression. Year is the column to represent the year for which data was used due to the availability of PB, PE and CAPE3. The numbers in square brackets are the t-statistics to test whether each coefficient is significantly different from zero. $*$,$**$, and $***$ represent the significant levels of 0.10, 0.05, and 0.01, respectively, from the t-tests.

Next, I test whether value premium can be explained by the global market index in table 7. I use the global portfolio returns and global risk-free rates from Kenneth Frenchs website. According to the table 7, αs are all positive and significant for the value portfolio. Therefore, CAPM, using global market returns, does not fully explain the value anomaly. In addition, βs in the value portfolios is not shown to be more than the growth portfolio in all cases. In the PE case, β of the portfolio is lower than the growth portfolio. Therefore, if we use price volatility as a proxy for risks, we cannot conclude that the value portfolio is riskier than the growth portfolio.

Table 7: CAPM Using Global Market Index

Portfolio	α	β_{Global}	R^2	F-Stat	P-Val	Obs	Year
LOW PB	1.36 **	0.10	0.0021	0.602	0.4384	292	1990-2014
	2.28	−0.78					
HIGH PB	0.56	−0.02	0.0001	0.02807	0.8671	292	1990-2014
	1.31	−0.17					
LOW PE	2.97 ***	0.01	0.0000	0.002772	0.9581	203	1998-2014
	4.32	0.05					
HIGH PE	0.84 *	−0.13	0.0092	1.867	0.1733	203	1998-2014
	1.83	−1.37					
LOW CAPE3	2.21 ***	−0.18	0.0091	1.642	0.2018	203	2000-2014
	3.33	−1.28					
HIGH CAPE3	1.27 **	0.01	0.0000	0.002312	0.9617	203	2000-2014
	2.60	0.05					

Note: This table shows information resulting from OLS regressions of value-portfolio excess returns constructed from PB, PE and CAPE3, based on global market index excess returns from Kenneth French's website. LOW PB is the portfolio containing the lowest quartile of PB. HIGH PB is a portfolio containing stocks with the highest quartile of PB. LOW PE is the portfolio consisting of stocks with the lowest quartile of PE. HIGH PE is a portfolio consisting of stocks with the highest quartile of PE. LOW CAPE3 is a portfolio that contains the lowest quartile of CAPE3 stocks. Lastly, HIGH CAPE3 is a portfolio containing high CAPE3 stocks. The α column represents the constant coefficients from all OLS regressions. β_{Global} is a column that contains the coefficients of the global market excess returns. R^2 is the column that represents the R^2 value of each regression. $F-Stat$ is the value of the F-statistics to test whether the β_{Global} should be zero. $P-Val$ is the column that represents the p-value from the F-test. *Obs* is the observation column that represents the number of observations in each particular regression. Year is the column to represent the year for which data was used due to the availability of PB, PE and CAPE3. The numbers in square brackets are the t-statistics to test whether each coefficient is significantly different from zero. $*$,$**$, and $***$ represent the significant levels of 0.10, 0.05, and 0.01, respectively, from the t-tests.

According to the table 5, 6 and 7, it appears that CAPM does not fully explain the value premium. αs are all positive and significant using all of the market's returns. In addition, βs in the value portfolios are not always higher than the growth portfolios, as CAPM predicts. This result is similar to Fama and French (2006) that states that CAPM fails to capture value anomalies. Therefore, I will try to explain the value premium using the Fama-French 3 factor model in the next section.

6 Can Fama-French 3 Factor Model Explain the Value Anomaly?

Next, I employ the Fama-French 3 factor model to explain the value premium introduced in Fama and French (1993). In particular, I regress the following equation,

$$R_p(t) - R_f(t) = \alpha + \beta_M[R_{Market}(t) - R_f(t)] + \beta_S * R_{SML}(t) + \beta_H * R_{HML}(t) + \epsilon(t). \quad (3)$$

In addition to market excess returns in the CAPM model, the factors are small minus large (SML) and high minus low (HML). These factors use data from Kenneth French's website. SML is the portfolio returns from investing in small stocks and shorting large stocks. HML is the portfolio returns from investing in high book to market stocks and shorting low book to market stocks. If the Fama-French 3 factor model can explain the value anomaly, I expect the α to be indifferent from zero. In addition, the insurance portfolio construction is based on value. Therefore, I expect the HML factor to help explain the value anomaly. I use the Asia and global Fama-French 3 factor returns from Kenneth French's website. The Asia factors exclude Japan, due to the fact that Japan has not exhibited value premium in the market over the past 26 years.

Table 8: Asia Market Fama-French 3-Factor Model

Portfolio	α	β_{Asia}	β_{SMB}	β_{HML}	R^2	F-Stat	P-Val	Obs	Year
LOW PB	1.09 *	−0.09	0.28	0.60	0.0393	3.9540	0.0087	298	1990-2014
	1.82	−0.93	1.41	3.15					
HIGH PB	0.47	0.03	0.18	0.18	0.0393	3.9540	0.0087	298	1990-2014
	1.08	0.38	1.26	1.33					
LOW PE	2.95 ***	−0.11	0.00	0.16	0.0080	0.5373	0.6572	203	1998-2014
	4.19	−1.04	0.01	0.79					
HIGH PE	0.77	−0.07	0.25	0.16	0.0196	1.3290	0.2659	203	1998-2014
	1.64	−0.95	1.60	1.16					
LOW CAPE3	2.13 ***	−0.15	0.17	0.26	0.0187	1.1190	0.3428	179	2000-2014
	3.06	−1.29	0.71	1.02					
HIGH CAPE3	0.94 *	0.10	−0.03	0.39 **	0.0277	1.6710	0.1750	179	2000-2014
	1.86	1.16	−0.17	2.09					

Note: This table shows information resulting from OLS regressions of value-portfolio excess returns constructed from PB, PE and CAPE3 on Fama-French three factors. Particularly, it uses three factors including Asia market excess returns, SML, and HML factors from Kenneth French's website. LOW PB is the portfolio containing the lowest quartile of PB. HIGH PB is a portfolio containing stocks with the highest quartile of PB. LOW PE is the portfolio consisting of stocks with the lowest quartile of PE. HIGH PE is a portfolio consisting of stocks with the highest quartile of PE. LOW CAPE3 is a portfolio that contains the lowest quartile of CAPE3 stocks. Lastly, HIGH CAPE3 is a portfolio containing high CAPE3 stocks. α column represents the constant coefficients from all OLS regressions. β_{Asia} is a column that contains the coefficients of the Asia market excess returns. β_{SMB} is a column that contains the size factor of the Fama-French 3-factor model. β_{HML} is a column that contains the value factor of the Fama-French 3-factor model. R^2 is the column that represents the R^2 value of each regression. $F - Stat$ is the value of the F-statistics to test whether the β_{Asia} should be zero. $P - Val$ is the column that represents the p-value from the F-test. *Obs* is the observation column that represents the number of observations in each particular regression. Year is the column to represent the year for which data was used due to the availability of PB, PE and CAPE3. The numbers in square brackets are the t-statistics to test whether each coefficient is significantly different from zero. *,**, and *** represent the significant levels of 0.10, 0.05, and 0.01, respectively, from the t-tests.

According to the table 8, the Fama-French 3 factor model, using the Asia data excluding Japan, still does not capture the value anomaly. The intercept or α is still significantly positive. The R^2 is higher than previous sections from CAPM, although this is what is expected as more variables are added to the regression. Observations are different in each measure (PB, PE, CAPE3) due to the availability of each measure. The only factor that is significant is from the use of CAPE3. The β_{HML} is positive and significant, which is counterintuitive. β_{HML} should be positive for the low CAPE3 case, as expected.

Table 9: Global Fama-French 3-Factor Model

Portfolio	α	β_{Global}	β_{SMB}	β_{HML}	R^2	F-Stat	P-Val	Obs	Year
LOW PB	1.20 **	−0.07	0.67 **	0.36	0.0244	2.4140	0.0668	298	1990-2014
	2.00	−0.48	2.37	1.37					
HIGH PB	0.54	−0.01	0.38 *	0.01	0.0120	1.1750	0.3196	298	1990-2014
	1.25	−0.08	1.86	0.07					
LOW PE	2.93 ***	0.01	0.12	0.07	0.0008	0.0527	0.9840	203	1998-2014
	4.18	0.07	0.35	0.25					
HIGH PE	0.73	−0.13	0.41 *	0.16	0.0274	1.8760	0.1349	203	1998-2014
	1.57	−1.32	1.86	0.92					
LOW CAPE3	2.18 ***	−0.18	0.08	0.03	0.0095	0.5630	0.6401	179	2000-2014
	3.14	−1.27	0.25	0.11					
HIGH CAPE3	1.13 **	0.01	0.22	0.17	0.0068	0.4027	0.7512	179	2000-2014
	2.23	0.08	0.91	0.84					

Note: This table shows information resulting from OLS regressions of value-portfolio excess returns constructed from PB, PE and CAPE3 on Fama-French three factors. Particularly, it uses three factors, including global market excess returns, SML, and HML factors from Kenneth Frenchs website. LOW PB is the portfolio containing the lowest quartile of PB. HIGH PB is a portfolio containing stocks with the highest quartile of PB. LOW PE is a portfolio consisting of stocks with the lowest quartile of PE. HIGH PE is a portfolio consisting of stocks with the highest quartile of PE. LOW CAPE3 is a portfolio that contains the lowest quartile of CAPE3 stocks. Lastly, HIGH CAPE3 is a portfolio containing high CAPE3 stocks. α column represents the constant coefficients from all OLS regressions. β_{Global} is a column that contains the coefficients of the global market excess returns. β_{SMB} is a column that contains the size factor of the Fama-French 3-factor model. β_{HML} is a column that contains the value factor of the Fama-French 3-factor model. R^2 is the column that represents the R^2 value of each regression. $F - Stat$ is the value of the F-statistics to test whether the β_{Global} should be zero. $P - Val$ is the column that represents the p-value from the F-test. *Obs* is the observation column that represents the number of observations in each particular regression. Year is a column to represent the year that data is used due to the availability of PB, PE and CAPE3. The numbers in square brackets are the t-statistics to test whether each coefficient is significantly different from zero. $*$,$**$, and $***$ represent the significant levels of 0.10, 0.05, and 0.01, respectively, from the t-tests.

Using the global Fama-French 3 factor model still fails to explain the anomaly of insurance value portfolios. The α's or the intercept of the regression are all positive and significant for the value portfolio. In addition, the growth portfolio has positive and significant α as well. However, the size factor has a positive and significant coefficient for the low PB case. This implies that size factor can partially explain the value premium, although only in the PB case.

Overall, the global and Asia Fama-French 3 factor models do not fully explain the value premiums of insurance value portfolios. The explanation of this finding could involve several issues, including the number of stocks in the value portfolio and the factors themselves. On average, each value portfolio consists of about four stocks. These stocks can be volatile in comparison to the studies of Fama and French (1993) that contain hundreds of stocks. The noise in the regression is so high that the Fama-French 3 factor fails to find the relationship between portfolio returns and the factors. The implication of this is that if investors concentrate on a few stocks instead of many, they can outperform the market with low portfolio volatility. In addition, as I used the available Fama-French 3 Factor models, globally and for Asia, an these factors might not be able to provide the explanation within the local market of Thailand. Therefore, it leaves some room for future research to construct a local Fama-French 3 factor model to explain this anomaly.

7 Conclusion

The study explores value stocks, specifically for insurance industry in Thailand. According to the results, we can argue that by focusing on a particular industry, investors can still outperform the market using a value investing strategy. Similar to previous value studies, this study finds value premiums within the Thai insurance industry. Investing in low value measures, such as PE, PB, CAPE3, and CAPE5, outperforms the market, although value premium does not always occur when we look too far back over many years, for example in the CAPE5 case. Using the traditional PE ratio can be very profitable to beat the market. This result is similar to Basu (1977). Using the value measure by PB ratio does not perform quite as well for insurance stocks, compared to the PE measure. However, the study does not consider size, so we cannot draw a conclusion that is similar to Fama and French (1992) that combines size and value factors, and absorbs the price-to-earnings factor to predict the returns from the stocks.

According to the results, price volatility from CAPM does not fully explain the value premium. Value stocks widely outperform the high PE, PB and CAPE3, even when adjusted for volatility and beta. Jensen's alpha is also higher for the value portfolio. In addition, the Fama-French 3 factor model using global and Asia factors do not capture the value anomaly. The author suspects that this is due to the small number of stocks in the portfolio, and also because the factors are not local enough for the Thai market. On the other hand, it shows that investors can achieve superior results by investing in low PB, PE and CAPE3 insurance stocks. It also achieves superior absolute returns with lower portfolio volatility.

Still, this study has some limitations. First, it focuses particularly on the insurance industry. It assumes that investors have a circle of competence that is based on the insurance industry. The study can expand to other industries within the stock market. Second, the number of stocks in the portfolio is arguably small (four, on average). Therefore, this result might be biased toward this limited dataset. One might argue that this is a result from a data snooping problem. However, one might also argue that in order to beat the market, there does not need to be a huge amount of stocks in the portfolio, which is the main point of this study. In addition, the study also uses a long period of time to construct and rebalance the portfolio. The results that show the value portfolio outperforming the growth portfolio seems to be in line with previous studies of the Thai stock market, such as Sareewiwatthana (2011, 2012, 2013).

In addition, there might be other factors in the behavior of investors to explain the value anomaly. The author leaves it to future research to explore these issues. In addition, the paper does not incorporate any quality measures into constructing the portfolios, as in Novy-Marx (2013) or Novy-Marx (2015), although the pure value portfolio can still outperform the market. The notion of investing in the things that an investor understands, or within a circle of competence has begun.

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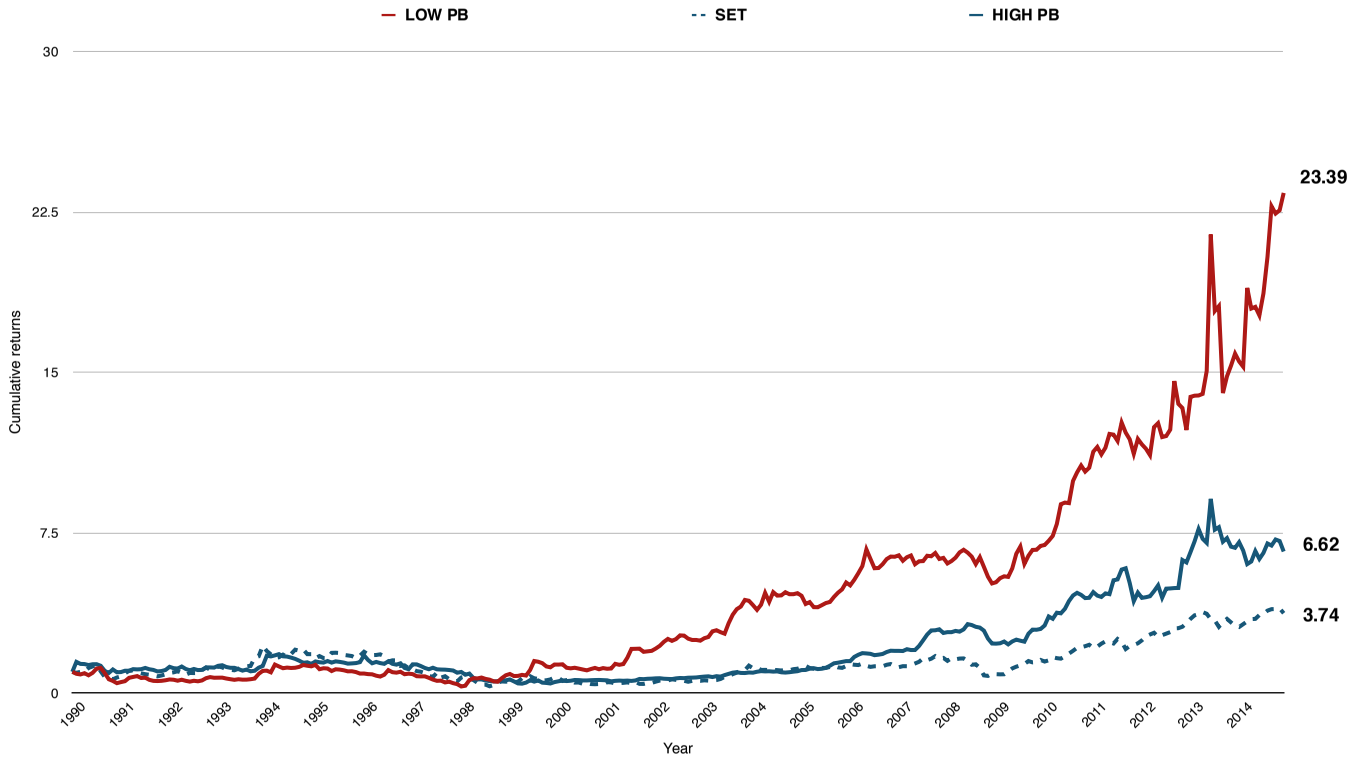

Figure 1: The chart compares the cumulative returns from the portfolios constructed, using the price-to-book (PB) ratio. Each portfolio starts with the amount of one baht and accumulates to the amount stated on the right of each line. The portfolios rebalance every January of each year. The LOW PB column represents the portfolio constructed from the first quartile of PB. The SET is the market portfolio including the dividend reinvested. The HIGH PB represents the portfolio with stocks in the last quartile with the highest PB.

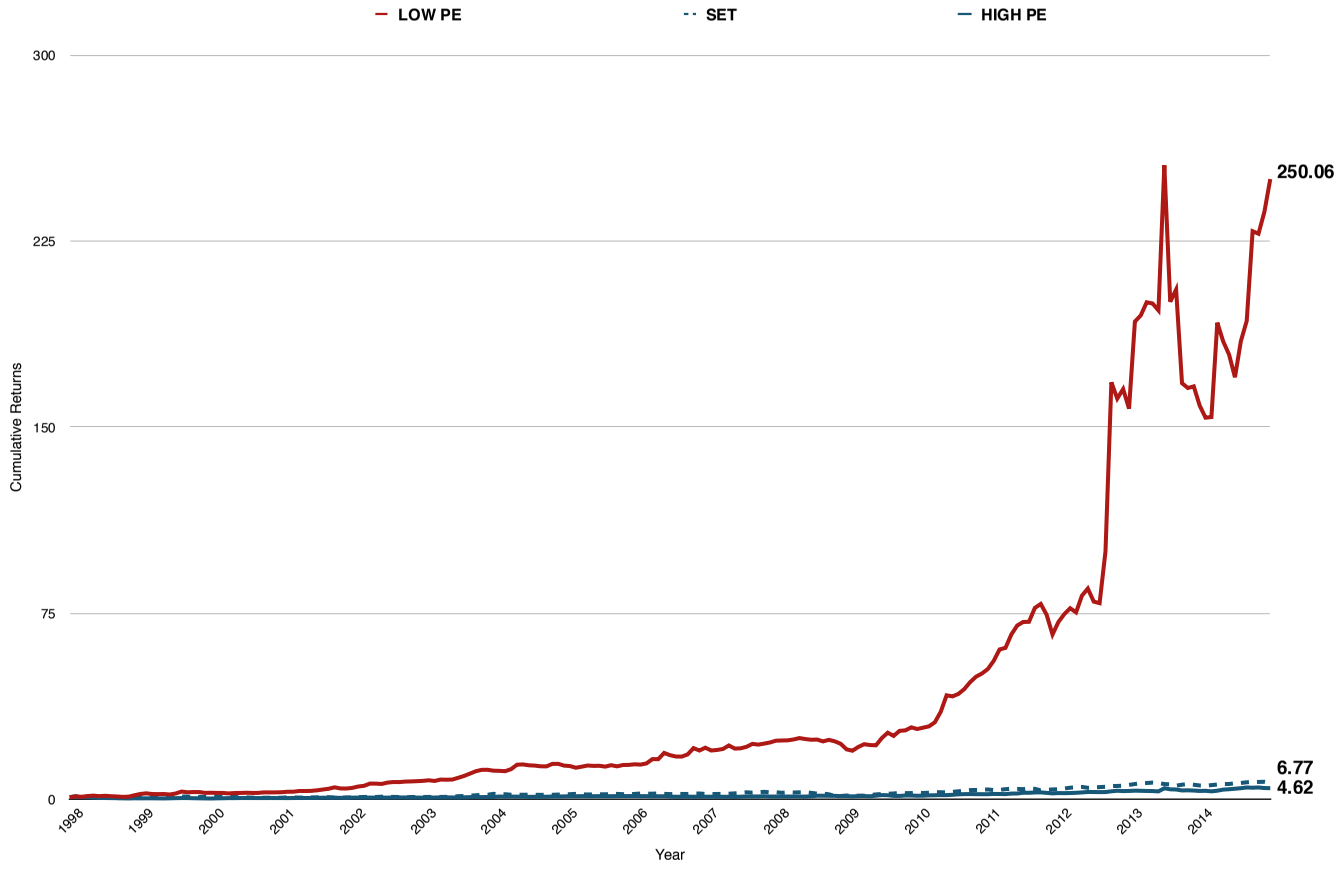

Figure 2: The chart compares cumulative returns from the portfolios constructed using the price-to-earnings (PE) ratio. Each portfolio starts with the amount of one baht and accumulates to the amount stated on the right of each line. The portfolios rebalance every January of each year. The LOW PE represents the portfolio constructed from the first quartile stocks with the lowest PE. The SET is the market portfolio including dividend reinvested. The HIGH PE represents the portfolio using stocks in the last quartile with the highest PE.

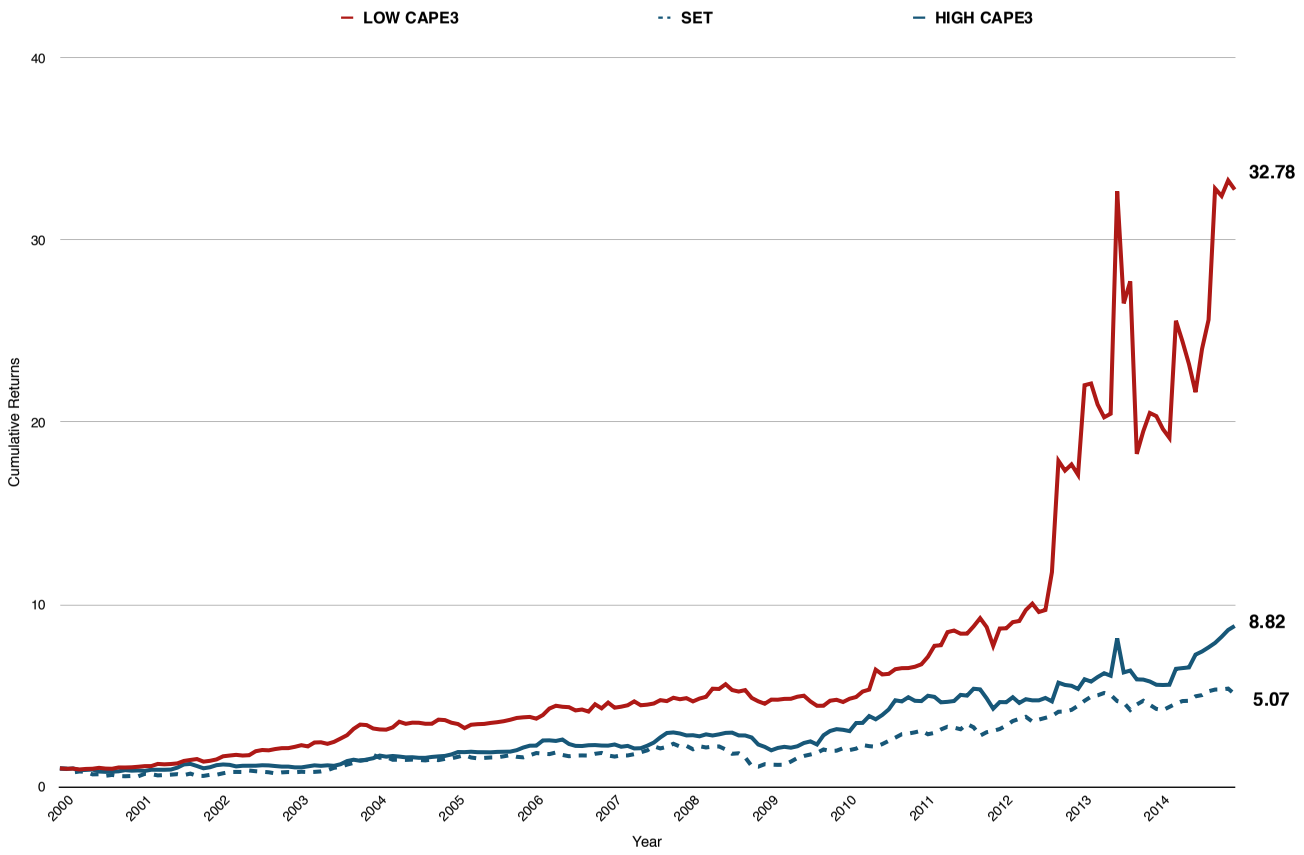

Figure 3: The chart compares cumulative returns from the portfolios constructed using CAPE3. Each portfolio starts with the amount of one baht and accumulates to the amount stated on the right of each line. The portfolios rebalance every January of each year. The HIGH CAPE3 represents the portfolio constructed from the first quartile stocks with the lowest CAPE3 ratios. The SET is the market portfolio including dividend reinvested. The HIGH CAPE3 represents the portfolio using stocks in the last quartile with the highest CAPE3.

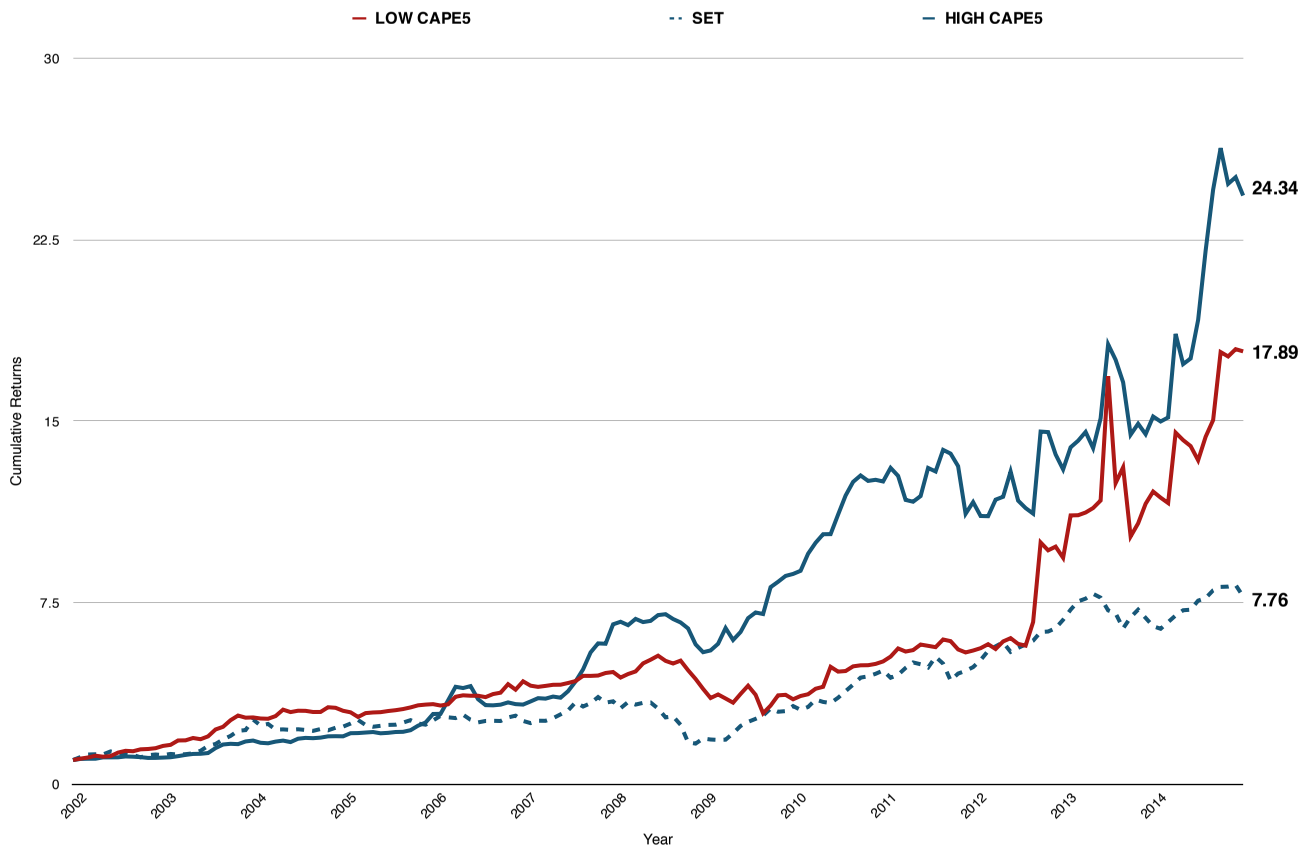

Figure 4: The chart compares cumulative returns from the portfolios constructed using the CAPE5 year ratio. Each portfolio starts with the amount of one baht and accumulates to the amount stated on the right of each line. The portfolios rebalance every January of each year. The LOW CAPE5 represents the portfolio constructed from the first quartile stocks with the lowest CAPE5. The SET is the market portfolio including dividend reinvested. The HIGH CAPE5 represents the portfolio using stocks in the last quartile with the highest CAPE5.

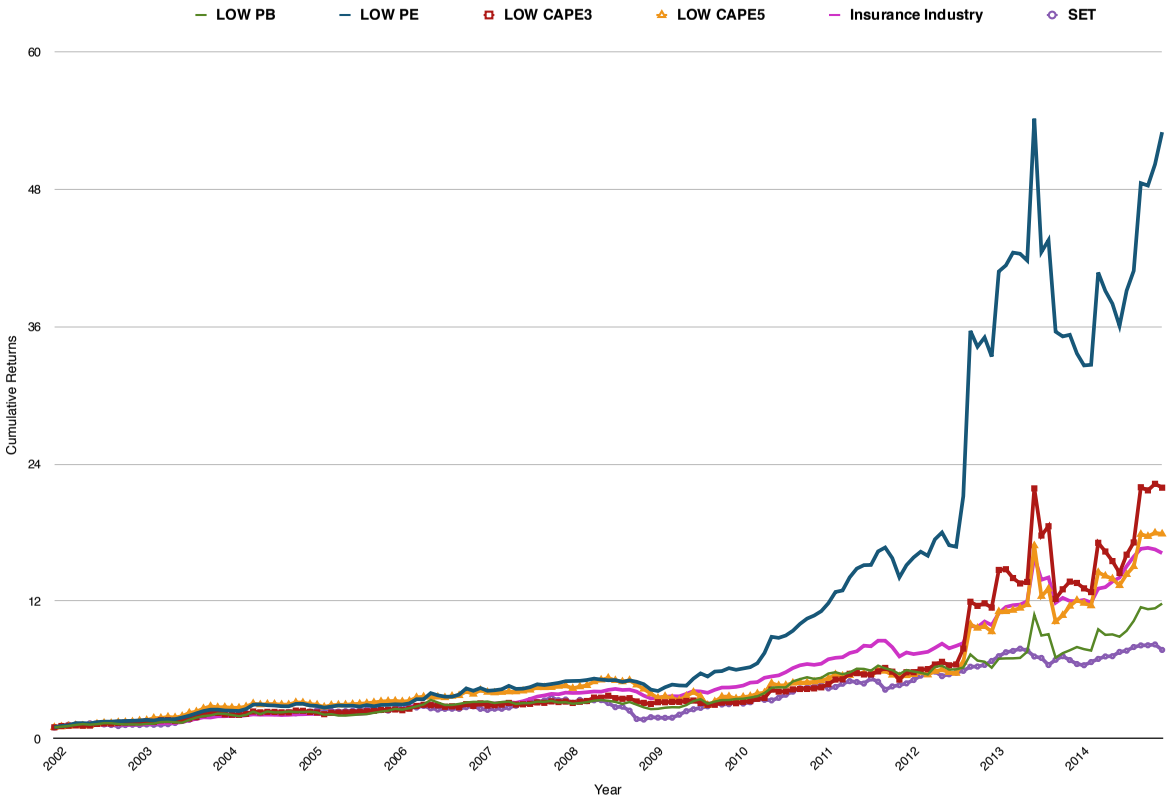

Figure 5: The chart compares cumulative returns from the portfolios constructed using stocks with a low value indicator. Each portfolio starts with the amount of one baht and accumulates to the amount stated on the right of each line. The portfolios rebalance every January of each year. The LOW PB column represents the portfolio constructed from the first quartile of PB ratios. The SET is the market portfolio including dividend reinvested. The LOW PE represents the portfolio constructed from the first quartile stocks with the lowest PE. The LOW CAPE3 represents the portfolio constructed from the first quartile stocks with the lowest CAPE3 . The LOW CAPE5 represents the portfolio constructed from the first quartile stocks with the lowest CAPE5. The SET is the market portfolio including dividend reinvested. The Insurance Industry includes the dividend reinvested. The insurance portfolio is constructed using the returns of all insurance companies in the Thai stock market.