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THE INFLUENCE OF PEG AND F_SCORE ON STOCK RETURN BY VALUED INVESTMENT PORTFOLIOS: EMPIRICAL EVIDENCE FROM VIETNAM

Hoa Thi Tuyet Le[1+]
Vinh Tuan Tran[2]
Nhan Thi Pham Nguyen[3]
Nam Sy Ngo[4]
Toan Luu Duc Huynh[5]

[1]*Associate Professor, Doctor of Philosophy, Lecturer of Faculty of Finance, Banking University of Ho Chi Minh City, Vietnam*
Email: hoaltt@buh.edu.vn
[2,3,4,5]*Lecturer of Faculty of Finance, Banking University of Ho Chi Minh City, Vietnam*


(+ Corresponding author)

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ABSTRACT

The study determines the effects of the PEG valuation factor (P/E combined growth rate) and the F_score on the calculation of the impacts on the return on the portfolio of empirically value stocks at 250 non-financial firms listed on the Vietnam's stock market from 2006 to 2017. The authors used system-GMM estimation method, quantile regression and t-test estimation to confirm the research hypotheses made by the authors. The results show that firms with low PEG and high F_score will yield higher return from empirical tests in the Vietnamese market, which is consistent with previous theories. Firms with increasing F_score will earn higher stock return and the portfolio of PEG-valued stocks will outperform others in the market. The authors used system-GMM estimation method to deal with the defects of the model and used quantile regression analysis to determine the effect level of the rate of return on each quantile in the Vietnamese stock market.

Contribution/ Originality: This paper is one of very few researches that have indicated the influence of both valuation factors (P/E combined growth rate) and the F_score on stock return in Vietnam by system-GMM approach. This study contributes to the existing literature to explain the integrated impact of both factors on stock return by some tests from the research country, Vietnam.

1. REVIEW OF THEORIES OF INVESTMENT VALUE

John B. Williams was the first to comment on this theory in the book Theory of Investment Value in 1938. He introduces a formula to determine intrinsic value of the stock, based on dividend income and the discount concept. Accordingly, in order to find the intrinsic value of the stock, Williams advises investors to take all discounted flow of dividends into consideration.

The Theory of Investment Value became popular when Professor Benjamin Graham published his Security Analysis in 1934 and The Intelligent Investor in 1949. Unlike Williams (1938) who only introducing a method of determining the intrinsic value, Graham and McGowan (2005) propose a method, which was later called investment value theory, to help investors find stocks with high profitability.

Graham (1973) focuses on the intrinsic value of stocks represented by assets, earnings, dividends, and financial strengths. Focusing on intrinsic value will prevent an investor from being misled by the misjudgments often made by the market during periods of deep pessimism or euphoria (Scott, 1996). According to Graham *et al.* (1934), value stocks are those whose market prices are lower than their fair value, determined by fundamentals such as dividends, profit, revenue, and growth. In other words, value stocks are those being undervalued when considering their historical sale growth and future growth prospects (Brown and Bentley, 2002). Thus, a stock which is considered a value stock must meet three factors: (i) is of high quality; (ii) Traded at lower its intrinsic value; and (iii) has good growth potential. Value investing is a method to help investors select stocks that meet all these three.

In another famous work on value investing, namely Common Stocks, Uncommon Profit, Fisher (2003) also advocates this theory. However, unlike Graham (1973) who is in favor of quantitative factors such as dividends, EPS and P/E, Fisher (2003) favors the qualitative factors such as, products, marketing activities, research and development (R & D), human resources, etc. Based on the investment value theory of Williams (1938); Graham (1973) and Fisher (2003) Warren Buffett has created the most successful investment method of all time; In it, he combined Graham's quantitative elements and Fisher qualitative elements to evaluate the value of the stock. He also used the Williams' discounted cash flow model for stock valuations and added investment time factor. According to Nikki (2000) Buffett believe that holding long-term value stocks would yield greater returns than holding short-term ones. According to Hagstrom (2005) Buffett's, theory of value investing can be summarized as follows: For a successful investment, investors should invest in high quality long-term stocks, (those that qualify for quantitative and qualitative factors of Fisher and Graham), which are underpriced. This investment viewpoint is also consistent with Lynch (1989) 's investment approach, the author of One Up on Wall Street. The big difference between Lynch and Buffett is in valuation method, in which Buffett used the cash flow discounted method to determine the intrinsic value while Lynch (1989) uses the PEG valuation method, a combination of P/E and growth rate of enterprises. In the theory of the Three-Factor Model, Fama and French (1995) prove that the intrinsic value of the stock (he used P/B as the valuation factor) and the size of the firm has a remarkable influence on stock returns; Accordingly, the rate of return on a stock is proportional to the intrinsic value of the stock and is inversely proportional to the size of the company. This is one of the works that contributed to his winning of the 2013 Nobel Prize for Economics. Later, studies on value investing theory were followed by scholars such as Piotroski (2002); Greenblatt (2010); Novy-Marx (2013) etc.

2. THE CONCEPT OF VALUE INVESTING THEORY IN THE STUDY

Based on the results of the theory of value investing, the authors propose the views on the concept of this approach in the paper as follows: Value investing is a method of stock selection that meets the following three criteria: (i) high quality stocks; (ii) traded at lower its intrinsic value; and (iii) having good growth potential in the future. The authors will use the PEG criterion from Lynch (1989) to select stocks that meet the two criteria: stocks that are under-valued and have good revenue growth. As for high quality stocks, the author will use the F_score model of Piotroski (2002) to evaluate.

2.1. Evaluation of Stock Quality Using the F_score Model

Piotroski (2000) uses 9 signals to measure corporate financial performance, including: Four indicators of profitability, (i) return on assets (ROA), (ii) change in return on assets (ΔROA), (iii) operating cash flow on assets (CFO), and (iv) accrued interest (ACCRUAL), calculated by deducting operating cash flow on assets from return on assets (ROA - CFO). Two performance measures, including changes in gross margin ratio (ΔMARGIN), changes in total asset turnover (ΔTURN). In addition, three signals of financial risk, including: changes in long-term debt leverage (ΔLEVER), changes in current payment ratio (ΔLIQUID) and stock issuance (EQ_OFFER). If the indicator is good, it will be marked 1, and 0 for bad ones. F_score is the total score of the indicators, so the score will range from 0 to 9. F_score = 9 represents the enterprise with the best financial signal, and F_score = 0 represents the worst financial signal. If F_score is below average, it is called low F_score and vice versa.

2.2. The Other Factors

As regards growth rate, in stock valuation, especially the method of using discounted cash flow, growth rate is very important, which is the basis for making forecasts on indicators such as revenue, profit. According to Damodaran (2012) there are now three popular ways to forecast the growth rate for any stock: First, investors' using historical data. This will be helpful in valuing stable companies over the years, but using this approach for companies with high growth rates will have limitations because forecasted growth rate of each indicator will hardly be accurate in this case. In this study, the authors used this method to calculate the growth rate. Second, using the data of stock analysts to give a reasonable estimate of the growth rate. The numbers provided by different analysts, however, can vary considerably, so the method can lead to falsification or contradiction. Third, estimating the growth rate bases on the basic elements of the company. This growth rate can be considered as the internal growth rate of the company. The growth rate of the company is determined by the level of reinvestment in new assets and the quality of the investment projects. Accordingly, the simplest relationship that determines the growth of a company is the relationship based on the percentage of retained earnings and the return on equity (ROE) of investments.

When it comes to determination of stock value, determining the value of stocks before making investment decisions is a very important task, greatly affecting the results of investment. An investment is considered good when the amount of money that the investors pay is lower than the value of the assets. Because the price of a stock is the cost of an investor, the value is the return that the investor receives. The greater the difference between the value and the price, the more the investment will pay off. A stock falling into this situation will be referred to as undervalued stock, which is the target of value investors. In this study, the authors use the PEG valuation method to identify whether stocks are underpriced or overpriced. According to Damodaran (2012) a company with a lower P/E than its growth rate (g) means that the company is undervalued. In other words, the undervalued company will have a PEG of less than 1. This method will help investors to find the difference in value between companies with different growth rates but retain the simplicity of the comparison method.

The PEG ratio is calculated using the formula as follows:

$$\mathrm{PEG} = \frac{\mathrm{P/E}}{\mathrm{g\ x\ 100}}$$

In which, g is the growth rate of profit after tax, calculated as follows:

$$g = \frac{(\mathrm{EAT_n} - \mathrm{EAT_{n-1}})}{\mathrm{EAT_{n-1}}} \times 100\%$$

P/E is the ratio between the market price of stock and earnings per ordinary share, which is determined as follows:

$$P/E = \frac{PRICE}{EPS}$$

P/E shows how many times the current stock price is higher than the return on that stock; in other words, how much an investor would have to pay for one income unit. The higher the P/E, the higher the price paid by the investor for a return unit on a stock, and vice versa. According to Damodaran (2002) P/E can be determined based on the current EPS (the paper uses this method to calculate the stock's P/E), EPS of the last four quarters or the expected EPS of the following periods.

3. OVERVIEW OF EMPIRICAL RESEARCHES ON VALUE INVESTING

The paper presents the study of two groups of research on value investing. The first is the research group on the effectiveness of investment value portfolio, whereby Basu (1977) indicates the theory of value investing through the relationship between P/E and the effectiveness of stock investment. The empirical results show that low P/E ratio portfolios have a higher average return on investment compared to those with higher P/E ratio, with the lowest P/E ratio portfolios having average return of 16.3% compared to the highest P/E ratio ones with 9.34% and profitability of all observations is 12.11%. Chan *et al.* (1991) study the relationship between return and the BM of stocks listed on the Tokyo Stock Exchange between January 1971 and December 1988. The results show that the BM coefficient is strong in explaining the average return of stocks in Japan. Specifically, the author has built four portfolios of stock indexes with the same weight. Furthermore, in these portfolios, the one that has the highest BM has an average return of 2.43% per month while the one that has the lowest BM has a return of 1.33% per month. Fama and French (1992) investigate the New York Stock Exchange between 1963 and 1990 for return on value shares. Accordingly, the stock is divided into 12 portfolios based on BM. The results show that the portfolio with the lowest BM index (corresponding to the highest P/B) had an average return of 3.7% per annum, while the portfolio with the highest BM (lowest P/B) had an average return of 24.31% per annum during the study period. Fama and French (1998) perform a study on a global scale including stocks in 13 countries in the Morgan Stanley Capital International (MSCI) index including the United States, Japan, Britain, France, Germany, Italy, Belgium, Switzerland, Austria, Hong Kong and Singapore that used the BM, P/E, P/CF and P/D ratios to classify the shares between 1975 and 1995. The study shows that the profitability of the BM portfolio was higher than the average of 7.68% during the study period in which 12 out of 13 countries had positive surplus except for Italy. Positive profit margin ranged from 2.3% (Netherlands) to 12.32% (Austria). Athanassakos (2009) uses both P/E and BM capitals to determine the stock value on the Canadian stock market during 1985-2005. When using the BM, the results showed that the return of the portfolios with high BM was 4.25% / year, 5.22% (Bear Market), 4.07% (Bull Market), 11.17% for the recession period and 3.52% for the recovery period. For P/E, the average return is 6.3%, 8.41% (Bear Market), 5.79% (Bull Market), 26.8% for the recession and 3.98% in the recovery period. Huynh *et al.* (2018) research on value investing by combining both P/E and P/B to build up portfolios for listed value shares on HoSE in the period of 2006 – 2016. This research also indicates the market premium, the size and value factors for valuing the stock return. It investigates the value elements to increase stock return, which interpret the value investment strategies could be applied in Vietnam. This is a motivation for us to re-examine this hypothesis based on the valued investment portfolios.

The second is a group of studies on the effectiveness of value investing with the integration of F_score, whereby Piotroski (2000) conducts empirical research of stocks on the US stock market in the period from 1976 to 1996 by selecting a group of high BM stocks from this high BM group, using a group of basic financial analysis based on the company's financial statements. The findings showed that the stocks with high BM have the return after one and two years holdings are 23.9% and 47.9% respectively, which is 5.9% and 12.7% higher than the market. Particularly, Piotroski's study also showed that high-F_score portfolios had a higher average return of 7.5% compared to the market and 23% higher than those of low F_score. Using the results of the regression to assess the factors affecting the profitability of listed stocks. Piotroski also showed that after controlling the differences in business size and BM, an improvement in the F_score corresponds to an increase of 2.5% to 3% profit for stocks. Mohr (2012) studies stocks in the Eurozone between 1999 and 2010, the study found that by scoring F_score and clustering high BM stocks, the high F_score portfolio had a higher return than the low F_score ones over the 8/12 years observed. The high F_score portfolios have a higher average return of 10.74% per annum compared to that of the market. Galdi and Lopes (2013) use F_score to develop value stock portfolios from the shares listed on the Sao Paulo Stock Exchange (Brazil) between 1994 and 2004. The findings show that the portfolios with high BM have a higher adjusted return of 5.7% compared to the market, however, after continuing to classify stocks with F_score, there is a clear shift in return. The adjusted return compared to the market average of high F_score was at 26.7% per year. In addition, the average return difference between the high F_score portfolios and the low F_score ones was 46.9% during the study period. Vo and Bui (2015) use F_score to select value stocks in the Vietnam's stock market from 2006 to 2013, indicating that F_score's investment strategy generates surpassing profits at HOSE. During the 1-year investment period, investors made up 16.1% of their net profit when implementing high F_score's stock investment strategy and short-selling stocks with low F_score. In addition, the strategy is more profitable in the investment period of 2 years, specifically in the implementation of strategies to buy high F_score stocks while short selling low F_score ones will bring in excess profits of 41.3%.

4. CONSTRUCTING THE RESEARCH HYPOTHESES

The purpose of the article is to determine whether the integration of the PEG and F_score valuation coefficients increases the efficiency of the value stock portfolio in the Vietnam stock market. Additionally, how is the impact of PEG and F_score on the profitability of the portfolio? Based on the above objectives, the author makes the following hypotheses for the study:

Hypothesis 1: The return on stock portfolio valued by PEG ratio will outperform market portfolio on Vietnam's stock market.

Hypothesis 2: The integration of the F_score coefficient into value investment theory raises the rate of return on the value stock portfolio.

Hypothesis 3: The PEG valuation coefficient, and the F_score, have an impact on the return of stocks.

5. DATA AND METHODOLOGY

5.1. Data Collection

We extract data from annual financial statements from enterprises. In addition, adjusted stock price with dividends and additional issuance, VN-Index and number of ordinary shares are primarily collected from Hochiminh Stock Exchange data (HoSE). The risk-free rate is obtained from International Monetary Funds (IMF). All data are ranged from 2007 to 2016 and are characterized in unbalanced panel data. In order to avoid biased estimation, we eliminate the stock covering in financial, banking and insurance sector out of our data.

5.2. Methodology and Research Hypothesis

We apply the quantitative techniques for estimation such as descriptive statistics, statistical test, regression and regression test with the following hypothesis based on the previous researches of Fama and French (1992); Piotroski (2000) and Athanassakos (2013).

H_1: Portfolio return generated by valued stocks is outperformed rather than market portfolio in Vietnam

H_2: The F_score integration into valued investment theory might increase return of valued stock portfolio

H3: The PEG and F_score factor impact on stock return at significance level.

We employed the basis of statistical techniques such as t-test for testing H_1 hypothesis. The remaining ones are tested by regression model with panel data. The estimation of OLS for panel data is primarily used for two cases such as fixed-effect model and random-effect model. Before concluding and giving some remarks, we test the consistency of research models by assumptions of OLS for errors. We will employ system-GMM to correct the disadvantages (or errors) from the previous estimation. In order to ensure that this methodology is consistency and reliable, we apply auto-regression for the serial data and Sargan test for checking the exogenous variables as instrument variables in models. Our methodology is mainly based on the procedure conducted from the research of Huynh and Cong (2017) to ensure the consistency of research model for panel data characteristics.

5.3. Proposed Research Model

Based on the CAPM model with adding more factors, we decide to construct the research model hereinafter:

$$R_{it} - R_{ft} = a + b(R_{mt} - R_{ft}) + c(R_{st} - R_{bt}) + d(R_{lt} - R_{ht}) + e(R_{hft} - R_{lft}) + e_t$$

In which,

R_{ft} is the risk-free rate at the t period

R_{mt} is the market return at the t period;

R_{st} is return of portfolio with small capitalization at the t period;

R_{bt} is return of portfolio with big capitalization at the t period;

R_{lt} *is return of portfolio with the parameter of PEG being lower or equal 1 at the t period*

R_{ht} *is return of portfolio with the parameter of PEG being higher 1 at the t period;*

R_{lft} is the return of portfolio with lower F_score

R_{hft} is the return of portfolio with higher F_score.

With the model above, we expect that the stock return will be negative influenced by PEG premium. This means that the stock with PEG being lower than 1 will generate more return, which is in accordance with Schatzberg and Vora (2009) and Lynch (1989). As regards F_score, we expect as Piotroski (2000) that the more F_score is, the more return is.

6. FINDING AND RESULTS

When it comes to the first hypothesis, the average return of valued stocks in portfolio is 15.42%, which is higher than the average of market return 15.65%, according to statistical results extracted from PEG valuation from 2008 to 2016 in Vietnam stock market. The t-test shows that the significance level is 0.0006. Therefore, we investigate that portfolio return generated by valued stocks is outperformed rather than market portfolio in Vietnam. This result is absolutely appropriate with the previous publications of Schatzberg and Vora (2009) as well as Lynch (1989).

Year	Number of stocks in portfolio	Average return of valued stock portfolio	Market return	Difference
2008	33	-30.59%	-44.28%	13.69%
2009	18	92.19%	-35.43%	127.61%
2010	64	-36.10%	63.13%	-99.23%
2011	61	11.99%	-11.38%	23.37%
2012	59	10.91%	-2.91%	13.81%
2013	54	44.58%	0.12%	44.46%
2014	80	29.89%	19.41%	10.47%
2015	117	25.90%	-3.50%	29.40%
2016	105	14.94%	12.74%	2.20%
Average		**15.42%**	**-0.23%**	**15.65%**

Figure-1. The comparison between the valued-stock portfolio and market portfolio

We apply the equally weighted method for calculating the average return of valued stock portfolio

ttest return=rm, t-statistics = 3.4411 degree of freedom = 735

p-value [mean(diff)] < 0 = 0.9997

p-value [mean(diff)] ≠ 0 = 0.0006

p-value [mean(diff)] > 0 = 0.0003

Figure-2. t-test results of valued stock portfolio (with 0 < PEG < 1) to compare to market portfolio

As regards the second hypothesis, we make two pairs of comparisons of differences in (1) valued stock portfolio with high F_score and market portfolio as well as (2) valued stock portfolio with low F_score and market portfolio.

Year	Number of stocks in portfolio	Average return of high F_score portfolio	Market return	Difference
2008	24	-22.43%	-44.28%	21.84%
2009	15	81.76%	-35.43%	117.19%
2010	50	-37.08%	63.13%	-100.21%
2011	45	20.81%	-11.38%	32.19%
2012	45	11.94%	-2.91%	14.84%
2013	47	46.04%	0.12%	45.92%
2014	65	37.66%	19.41%	18.25%
2015	96	35.45%	-3.50%	38.95%
2016	84	15.46%	12.74%	2.72%
Average		**20.43%**	**-0.23%**	**20.66%**

Figure-3. The comparison between portfolio with high F_score and market portfolio

Noted: High F_score ranges from 6 to 9 points. We apply the equally weighted method for calculating the average portfolio's return based on number of stocks

From 1667 observations, we figure out that the differences between high F_score portfolio and market return is 20.66%.

Year	Number of stocks in portfolio	Average return of high F_score portfolio	Market return	Difference
2008	9	-37.98%	-44.28%	6.30%
2009	3	148.76%	-35.43%	184.19%
2010	14	-39.40%	63.13%	-102.53%
2011	16	-8.60%	-11.38%	2.78%
2012	14	4.32%	-2.91%	7.23%
2013	7	34.07%	0.12%	33.95%
2014	15	8.70%	19.41%	-10.71%
2015	21	8.30%	-3.50%	11.80%
2016	21	15.03%	12.74%	2.30%
Average		**2.79%**	**-0.23%**	**3.02%**

Figure-4. The comparison between portfolio with low F_score and market portfolio

Noted: High F_score ranges from 0 to 4 points. We apply the equally weighted method for calculating the average portfolio's return based on number of stocks

Meanwhile, the difference between low F_score portfolio and market return is 3.02%. Interestingly, this figure is higher than the portfolio without adding F_score 15.56%. We perform t-test to ensure that the result is significance level at statistical results. The result indicates that outperformed return of valued stock portfolio (adding high F_score) is significance at 1% with p-value 0.0001 whereas we do not have sufficient evidence to reject null hypothesis 'The return generating from low F_score portfolio equals the market return'. To sum up, based on statistical findings, we conclude that integrating F_score into valued stock portfolio will benefit more with outperformed return in comparison with market return 20.66%. This result is completely matched with Piotroski (2000).

ttest return=rm, t-statistics = 3.8477 degree of freedom = 470
p-value [mean(diff)] < 0 = 0.9999
p-value [mean(diff)] ≠ 0 = 0.0001
p-value [mean(diff)] > 0 = 0.0001

Figure-5. t-test for portfolio with 0 < PEG < 1 and high F_score

ttest return=rm, t-statistics = 0.3062 degree of freedom = 264
p-value [mean(diff)] < 0 = 0.6201
p-value [mean(diff)] ≠ 0 = 0.7597
p-value [mean(diff)] > 0 = 0.3799

Figure-6. t-test for portfolio with 0 < PEG < 1 and low F_score

It is considerable to test the impact of PEG and F_score on stock return. We calculated capitalization, F_score, PEG to divide into three groups of portfolios such as high, medium and low. Afterwards, we estimate the premium of many factors by using the differences between the high portfolio and low portfolio. In the following part, the sorted of portfolio includes many stocks with high F_score scoring from 6 to 9. The medium one has 5 points of F_score. The remaining group (low F_score portfolio) has ranged from 0 to 4. The low PEG portfolio includes stocks calculating from 0 to 1. The portfolio's returns are calculated from the May in this year to May in the next year, in order to well match the time of financial statement disclosure. Furthermore, we employ the capitalization calculation for each stock to estimate the premium. In order to ensure the change by one year, the F_score and PEG are estimated by each year. In addition, we construct new portfolio by each year and re-calculate the premium by each year to ensure the consistency in research models.

We proposed the final research model for regression as follows:

$$\mathbf{RIRF = a + bRMRF + cPPEG + dPMARKETCAP + ePFSCORE + e_t}$$

In which, RIRF means $\mathbf{R}_{it} - \mathbf{R}_{ft}$; RMRF means $(\mathbf{R}_{mt} - \mathbf{R}_{ft})$; PPEG means $(\mathbf{R}_{lt} - \mathbf{R}_{ht})$; PMARKETCAP means $(\mathbf{R}_{st} - \mathbf{R}_{bt})$; and PFSCORE means $(\mathbf{R}_{hft} - \mathbf{R}_{lft})$.

Before performing the regression step, we would like to calculate description statistics for each variable in model.

Variable	Obs	Mean	Std. Dev.	Min	Max	Skewness	Kurtosis
RMRF	1667	-0.0783	0.2738	-0.7060	0.3826	-0.3316	3.1938
RIRF	1667	0.1307	0.6254	-0.9368	7.3384	3.1827	26.0126
PPEG	1667	0.0150	0.1046	-0.1467	0.1947	-0.0322	2.24237
PMARKETCAP	1667	0.1031	0.1631	-0.2196	0.5995	1.1564	5.8153
PFSCORE	1667	0.0038	0.0804	-0.2049	0.0938	-1.1419	3.4566

Figure-7. Statistical description of each variable

We performed statistical description for 1,667 observations (with an increasing of companies from 2007 to 2015) to ensure the consistency of data. At the first glance, these figures are quite appropriate with the mean value. Therefore, we can be confident to use them for estimation.

Variable	VIF
PFSCORE	4.89
PPEG	4.15
PMARKETCAP	1.59
RMRF	1.24

Figure-8. Variance inflation factor

All these VIF score are under 10. This means that all independent variables have no multicollinearity. Furthermore, we also perform Breusch-Pagan / Cook-Weisberg test for heteroscedasticity. The result indicates that p-value is under 0.01, which means that the data faces heteroscedasticity phenomenon. Hence, using quantile regression is one of methodologies to correct this error from dataset for heteroscedasticity and it demonstrates the influence level of each chosen quantile. In addition, the Wooldridge test for autocorrelation in panel data shows that p-value is lower than 0.01. Therefore, we reject the null hypothesis of Wooldridge test. This means that the dataset has autocorrelation in the first order. We propose the cluster methodology or quantile regression to correct this concern.

7. DISCUSSION

By obtaining the unbalanced data with number of firms increasing by each year, we commence the regression with the panel-data regression methodology with Fixed-Effect-Model and Random-Effect-Model. The first glance view of results shows that most coefficients extracted from regression are significance at 1%.

Variables	Pool OLS	FEM	REM	Quantile regression		
				q25	q50	q75
RMRF	-0.2840***	-0.2808***	-0.2840***	-0.3150***	-0.2700***	-0.3246***
	[0.0655]	[0.0669]	[0.0656]	[0.0436]	[0.0686]	[0.1033]
PPEG	3.4510***	3.4542***	3.4510***	3.0907***	3.2824***	3.7161***
	[0.26815]	[0.2723]	[0.2682]	[0.2990]	[0.2343]	[0.3800]
PMARKETCAP	-1.9535***	-1.9485***	-1.9536***	-1.7330***	-1.9347***	-2.1590***
	[0.10634]	[0.1082]	[0.1063]	[0.0769]	[0.0935]	[0.1018]
PFSCORE	3.7990***	3.7830***	3.7991***	3.8308***	4.0811***	4.3396***
	[0.378967]	[0.3853]	[0.3790]	[0.4168]	[0.4158]	[0.5036]
R-squared	0.2122	0.2407	0.2407	0.1641	0.1549	0.1427

Figure-9. The regression result by Pooled-OLS, FEM, REM and quantile regression (with τ = 0.25; 0.5; 0.5)

Significant level at the 10%, 5% and 1% are denoted *, ** and *** respectively

We also perform test of consistent and unbiased as results indicated follows:

	Heteroscedasticity	Autocorrelation	Endogeneity
Result	Yes	Yes	Yes
Proposed estimation	System-GMM		

Figure-10. The results of Heteroscedasticity, Autocorrelation, Endogeneity Test

After testing the errors in model, we investigate that pooled-OLS and panel data estimation is not consistency and biased. Hence, the results are not reliable for interpret as well as deliver implications. Based on Davidson and MacKinnon (1993) research, when putting the lags order variables into the models, the phenomenon of endogeneity in research model might happen. We come into conclusion to choose system-GMM to correct the errors within the model.

Variable Y = RIRF	System-GMM
LAG2(RIRF)	-0.32283***
	[0.12321]
RMRF	-0.94678***
	[0.2209]
PPEG	4.2852***
	[0.6650]
PMARKETCAP	-1.1615***
	[0.28206]
PFSCORE	5.0926***
	[0.75813]
CONS	0.10157***
	[0.03571]
p-value AR(1)	0.000***
p-value AR(2)	0.106
Sargan test (p-value)	0.271
Sargan test (IV)	0.847

Figure-11. The system-GMM estimation for research model to use instrumental variables to control the endogeneity

Significant level at the 10%, 5% and 1% are denoted *, ** and *** respectively

Based on the system-GMM estimation, there is correlation regarding auto-regression in the first order [when rejecting null hypothesis of AR(1)]. However, we do not reject the null hypothesis of AR(2). This ensures that the system-GMM has the consistency. Furthermore, the Sargan test applied for using instrumental variables is appropriate with p-value > 0.05 (do not reject null hypothesis or Sargan test). Hence, we used the lags-order of endogeneity variables as instrumental variables appropriately. To sum up, the estimation by system-GMM is quite consistency and we can use it for interpreting results.

Firstly, the market premium has a negative impact on stock return during the period from 2007 to 2016. This means that the portfolio including these stocks has the inversed direction with the market premium at significance level 1%. The result is considerably different with Fama and French (1995). It can be explained that the existence of banking and financial sectors is. The stocks sorting in banking and financial group have large capitalization, which contributes to the high portion in constituting the VNI-Index. VNI-Index is used to extract the market return for regression estimation. In addition, the banking sector in the period from 2007 to 2016 face many difficulties; therefore, the stock price sharply declined, which results in the negative return. Meanwhile, the non-financial firms are collected in our data have less impact by the financial crisis of 2007. Hence, it recovered soon. This leads to the inversed signs between group of these stocks and market return.

Secondly, the premium of PEG factor has positive value. The lower PEG ranges from 0 to 1, the more return is generated. This interpretation is significance level at 1%. This result is totally appropriate with the previous researches as Schatzberg and Vora (2009) and. Lynch (1989).

Thirdly, the premium of capitalization has the negative sign. We can interpret that the stock with high capitalization will generate more return. This result is quite different with Fama and French (1995). This can be explained by the elimination of banking and financial sector out of data scope. The remaining stocks in portfolio, which are quite large capitalization, own the good basis information and high price, for example, Vietnam Dairy Products Joint Stock Company. This firm has the largest capitalization in portfolio with 10% for the total. However, it is also valued at the high return in this period. With the reasons mentioned above, the return of high capitalization portfolio will increase highly rather than the lower one.

Fourthly, when the F_score premium increase, the return of portfolio will go up in the significance level at 1%. This result is completely in accordance with the previous of Piotroski (2000).

Fifthly, We use the quantile regression to correct the heteroscedasticity, autocorrelation, endogeneity and to evaluate for each quantile influence, particularly 0.25; 0.5 and 0.75. We investigate that these results are distinguished within coefficient. To be more specific, as regards the market premium, the stocks with low return have more sensitivity rather than the medium and big one. All of them are significance level at 1%. Meanwhile, in the scope of high return stocks, when F_score changes at significance level 1%, the response is the highest. This can also be explained by the market capitalization.

8. CONCLUSION

From the empirical evidence from Vietnam, we investigate some following conclusions. Primarily, the stock return from valued-based-on-PEG portfolio outperform rather than market portfolio in Vietnam stock exchange at the specific threshold of 15.65%. This result is completely matched with the previous researches such as Schatzberg and Vora (2009). In addition, adding F_score into model will benefit more return with the outperforming value up to 20.66%. We can come into conclusion that this result is appropriate with the paper of Piotroski (2000). The less value of PEG ranges from 0 to 1, the more stock's return is. It is well matched with the researches of Schatzberg and Vora (2009); Lynch (1989). Finally, yet importantly, when F_score goes up, this factor will contribute to an increase in stock return, which is appropriate with Piotroski (2000) research. Especially, in scope of the high stock return group, when F_score changes, the surpluse of return is higher than the counterpart group.

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