The Impact of Higher Moments on the Stock Returns of Listed Companies in Vietnam

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Received: 18 July 2017 | **Revised:** 12 December 2017 | **Accepted:** 20 December 2017

Abstract: The purpose of this study is to identify the role of higher moments in explaining the volatility of stock returns. By using system GMM estimator with unbalanced panel data of listed companies on the Ho Chi Minh Stock Exchange (HOSE) in the period 2006-2015, the paper reveals two higher momentum factors which play an important role in analyzing the volatility of stock returns. In particular, the skewness has a positive correlation with the stock return, while the kurtosis is negatively correlated with the stock returns. The study also finds the statistical significance of moments with regard to the industry sector and market condition factor.

Keywords: higher moment, skewness, kurtosis, stock return, system GMM.

JEL Classification: C58 . G12.

Citation: Nguyen Doan Man (2017). The Impact of Higher Moments on the Stock Returns of Listed Companies in Vietnam. *Banking Technology Review,* Vol 2, No.2, pp. 221-238.

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1. Introduction

Common stock valuation models such as the CAPM by Sharpe (1964) and Lintner (1965), the Fama and French three-factor model (1993) and the Carhart four-factor model (1997) are all based on the assumption that the stock return is normally distributed. In contrast, some other studies show that the stock return does not follow the normal distribution model. For example, Fama & Macbeth (1973) and other researchers supposed that the stock return has an asymmetric distribution (Hasan & Kamil, 2013; Pettengill, Sundaram & Mathur, 1995). Therefore, in addition to evaluating the first two moments mean and variance, it is essential to consider two higher moments in the stock pricing model. Many studies reveal the higher moments - skewness and kurtosis - have an impact on the stock return. Kraus & Litzenberger (1976) argued that the skewness is negatively correlated with the stock return and the model with the presence of the skewness is more analytically reasonable than the CAPM. Harvey & Siddique (2000) also demonstrated the suitability of the model after adding the skewness. Moreover, several studies prove higher momentum factors have an influence on the stock return such as Hung, Shackleton & Xu (2003); Agarwal, Bakshi and Huij (2008); Doan Minh Phuong (2011); Kostakis, Muhammad & Siganos (2012); Hasan et al. (2013); Ajibola, Kunle & Prince (2015); Truong Quoc Thai (2013); Vo Xuan Vinh & Nguyen Quoc Chi (2014). In Vietnam, the stock pricing act is not being performed effectively which only includes market description, graph drawings and statistics while specialized software for valuation and optimal portfolio establishment are not commonly used. Although some investment funds use specialized software, most of them are simple models, while other models such as the moment-CAPM which are proved to be better than conventional models have not been used.

Therefore, this research is carried out to evaluate the impact of higher momentum factors - skewness and kurtosis - on the volatility of the expected stock return. Some intermediate goals that the study works towards are analyzing the magnitude and direction of the impact of skewness and kurtosis on the expected stock return, then comparing the explanatory power of the CAPM and the moment-CAPM; analyzing the magnitude and direction of the impact of skewness and kurtosis on the expected stock return with regard to a market condition; and evaluating the explanatory power of higher momentum factors in each industry sector to the stock return.

This research draws upon mostly the works of Kraus et al. (1976), Hung et al. (2003) with the addition of dummy variables to the model which is a highlight compared to previous studies in Vietnam. Specifically, compared to Truong Quoc Thai (2013) or Vo Xuan Vinh et al. (2014), this research stands out for examining the impact of market factors by adding a dummy variable D representing the market condition to the model; analyzing the impact of each industry sector to the explanatory power of higher moments to the stock return by using dummy variable GICS. In addition, another highlight is that the author uses system GMM method for the data panel in order to solve statistical problems such as auto-correlation, multi-collinearity, heteroscedasticity and endogenous variables.

The study will contribute empirical evidence to an impact of higher moments on the stock return of listed firms in Vietnam. This result will suggest important policy implications to portfolio managers and investors for analyzing and trading securities which ensure the efficiency in investment as well as provide information for policy makers to control the performance of market.

2. Literature Review

Markowitz's modern portfolio theory (1952) and the CAPM assumed the asset return follows an absolute distribution, which only considers variance and mean factors in the model. Therefore, the curve of the asset return distribution is symmetrical bell shaped. However, empirical findings have proved that the asset return hardly follows an absolutely symmetrical distribution, they may deviate to right or left, high or low. The left or right axis deviation is measured by the skewness (the third moment) while the tailedness of the probability distribution is measured by the kurtosis (the fourth moment). Until now, the two famous asset pricing models CAPM and three-factor model are still commonly used. However, many researchers suggest that not evaluating the impact higher momentum factors may cause potential risks to investors.

Kraus et al. (1976) argued if the expected return of a portfolio is asymmetrically shaped, the research model needs to add a new factor - the skewness. Indeed, based on monthly crossover data set collected from the New York Stock Exchange (NYSE) in the period 1935-1970, the research revealed the coefficients of both market risk and skewness are robust estimators and statistically significant. In particular, the skewness has a negative correlation with the stock return.

Harvey et al. (2000) found the impact of the skewness on the stock return based on monthly data set collected from the NYSE, AMEX, NASDAQ in the period 1963-1993. The research added the skewness factor to the CAPM and Farma three-factor model in order to examine the reliability of these models by looking at the adjusted R2. By two regression methods maximum likelihood estimation (MLE) and ordinary least squares (OLS) with cross data, the result showed the impact of the skewness risk premium on the expected stock return of a portfolio.

Hung et al. (2003) studied the impact of two higher momentum factors on the volatility of stock returns in the UK stock market in a both upward and downward trend in the period 1975-2000. Based on researches by Farma & French (1992), Pettengil et al. (1995), Harvey et al. (2000), the authors developed a model from the three-factor model with the addition of two higher moments such as skewness and kurtosis. With the assumption of OLS regression, the result revealed the beta coefficient is statistically significant; however, it could not find the impact of the two higher momentum factors on the expected return. This result is contrary to that of Kostakis et al. (2012) which also used the data set from the UK stock market in the period 1986-2008. Drawing upon the three traditional asset pricing models, the CAPM, Fama et al. (1993) and Carhart (1997), the authors considered the risks of skewness and kurtosis to these models. Kostakis et al. (2012) used two-stage least-squares regression analysis to identify the risk premium for them. The result showed the risk premium for skewness and kurtosis has statistical significance. Moreover, the model with the addition of the two factors had more explanatory power than the previous models. In detail, the skewness risk premium is positively correlated with the expected return whereas the risk premium for kurtosis has a negative impact.

Another research from the US stock market in the period 1994-2004 is from Agarwal et al. (2008). The authors collected data from 5,336 investment funds; however, they had to eliminate 2,027 observations due to their liquidity, mergers and acquisitions, and business closure. The investment funds were divided into 27 stock portfolios for simulation to assess the efficiency of their operations by estimating the risk premium for volatility, skewness and kurtosis. The research result revealed the impact of these three risk factors. In particular, the skewness is positively correlated with the stock return while the kurtosis is negatively correlated. The research also proved the models after adding higher moment risks are more explanatory than the models from previous studies.

Another empirical study on the Bangladesh stock market is carried out by Hasan et al. (2013). They examined the efficiency of adding two more risk momentum factors skewness and kurtosis to the CAPM. The research data was collected from 71 non- financial companies on the Bangladesh stock market in the period 2002-2011. With the assumption of OLS and MLE regressions, the result revealed the moment-CAPM can explain the volatility of stock return better and both two risk factors added are statistically significant.

Ajibola et al. (2015) also, examined the impact of risk factors on the stock return on the Nigeria stock market in the period 2003-2011 with the addition of higher moments to the CAPM. The result implied: (i) in the absence of dummy variable D (representing the market condition), only the skewness risk plays a role in explaining the volatility of stock return in an investment portfolio whereas the coefficients of risk premium representing the covariance and kurtosis have no statistical significance; (ii) when analyzing the impact of market condition, it showed that the coefficient estimates are statistically significant in a bull market; however, in a bear market, the coefficients of kurtosis have no statistical significance, only the covariance and skewness can explain the volatility of the stock return.

In Vietnam, Vo Xuan Vinh et al. (2014) studied the relationship between higher moments and the expected return of a stock portfolio based on the data from listed companies on the HOSE in the period 2006-2013. The risk factors used in this research were covariance, skewness and kurtosis. Based on the study of Farma et al. (1973), the research revealed the risk premium for kurtosis has a statistical significance at 10% level whereas the risk premium for covariance and skewness has no statistical significance. Truong Quoc Thai (2013) had a research on the asset valuation with regard to higher momentum factors to understand the importance of high moments to the volatility of the average stock return of 147 listed companies on the HOSE. Based on the research of Doan Minh Phuong (2011) and OLS regression, the result showed both the skewness and kurtosis play an important role in the stock valuation act on the Vietnam stock market. However, due to different research portfolios, the direction of impact is not obvious. In addition, the research stated that because of the small scale of listed companies on the market, the impact of skewness on the stock return is greater than that of kurtosis.

In summary, some researchers could not find the statistical significance of two higher momentum factors (Hung et al., 2003) whereas others have found the impact of these factors, but in an inconsistent direction. Harvey et al. (2000), Kraus et al. (1976) found the negative impact of skewness; Kostakis et al. (2012) argued both the skewness and kurtosis influence positively on the expected stock return; while Agarwal et al. (2008) found that skewness has positive correlation with the expected stock return and kurtosis has an opposite impact.

Based on the modern portfolio theory and empirical evidence of previous findings, the author builds the research assumptions as follow:

H1: High momentum factors - skewness and kurtosis - have an impact on the expected stock return

H2: Stocks with negative skewness and positive kurtosis are not good for the portfolio.

H3: The impact of skewness and kurtosis is subject to the market volatility. In a bear market condition, increasing risk may not increase the expected return.

H4: Each industry sector has a different influence on the impact of skewness and kurtosis.

3. Data and Methodology

3.1. Data

This research uses data from the share prices of listed companies and the VN-Index, which are collected daily from January 1, 2006 until December 31, 2015 on the HOSE. The price collected is the closing price at the end of a trading day. On holidays or weekends, the share price keeps remaining from the last trading day (day t-j, where j is the number of non-trading days). The data excludes delisted companies, exchange switching companies, listed companies which are halted in a long period, or companies which cannot meet the required length of data. Specifically, each observation of each company must be continuous over a four year period. If an observation is available in only three years or less, that company will be excluded from the research data set. The research data structure is unbalanced panel data.

3.2. Research Model

Firstly, to evaluate the impact of higher momentum factors on the stock return, the author builds an empirical model based on the CAPM and models of Kraus et al. (1976) and Hung et al. (2003). This is actually the CAPM with the addition of two higher moments - skewness and kurtosis:

$$R_i - R_f = a_0 + a_1.beta + a_2.skew + a_3.kurt + \varepsilon_i \quad (1)$$

Where: R_i - the daily return of stock i which is calculated with the formula: $R_i = \ln(P_t/P_{t-1})$, where Pt represents the price of stock i at time t and P_{t-1} is the stock price at t-1; R_f - the return of risk-free asset (represented by 1-year Treasury bill rate. Data is collected from the Hanoi Stock Exchange); beta: the beta coefficient of stock i in correlation with the stock market; skew - the skewness of stock i in correlation with the stock market; kurt - the kurtosis of stock i in correlation with the stock market; a_i - the regression coefficient of each variable; ε_i - the residuals.

• Beta coefficient

According to Kraus et al. (1976), the formula for calculating beta is:

$$beta = \frac{E[\{r_i - E(r_i)\}\{r_m - E(r_m)\}]}{\{r_m - E(r_m)\}}$$

Where: r_i and r_m are the extra expected return of asset i and stock market compared to the free risk asset.

• Skewness coefficient

According to Kraus et al. (1976), the skewness of stock i in correlation with the market is calculated by:

$$skew = \frac{E[\{r_i - E(r_i)\}\{r_m - E(r_m)\}^2]}{\{r_m - E(r_m)\}^3}$$

• Kurtosis coefficient

Likewise, the kurtosis of stock in correlation with the market is calculated by:

$$kurt = \frac{E[\{r_i - E(r_i)\}\{r_m - E(r_m)\}^3]}{\{r_m - E(r_m)\}^4}$$

Secondly, to measure the impact of the market condition on the explanatory power of high moments to the stock return, if the market moves up or goes down whether the magnitude and direction of the impact of higher moments change or not; the study expands model 1 by adding dummy variable D representing the market factor:

$$R_i - R_f = b_0 + b_1.D.beta + b_2.(1-D).beta + b_3.D.skew + b_4.(1-D).skew + b_5.D.kurt + b_6.(1-D).kurt + \mu_i \quad (2)$$

Where: b_i - the regression coefficients of each variable; μ_i - the regression residuals; D - the dummy variable representing the market condition, D = 1 if the market goes up ($R_m - R_f > 0$), D = 0 if the market goes down ($R_m - R_f < 0$).

Finally, to examine the impact of each industry on the explanatory power of higher moments to the stock return, the study adds dummy variable GICS representing the industry factor to model 1:

$$R_i - R_f = c_0 + c_1.beta + c_2.skew + c_3.kurt + c_m.gics_j.skew + c_n.gics_j.kurt + \pi_i \qquad (3)$$

Where: c_i - the regression coefficient of each variable; π_i - the regression residuals; $gics_j$ - the vector of dummy variables representing the industry sector factor based on The Global Industry Classification Standard (GICS); j - valid from 1 to 8; m, n: regression coefficient indexes.

The Global Industry Classification Standard (GICS) was developed by Morgan Stanley Capital International (MSCI) and Standard & Poor's in 1999. The GICS structure consists of 10 sectors, 24 industry groups, 67 industries and 147 sub-industries. The HOSE has relied on this classification system since January 2016.

3.3. Methodology

In the research, the author uses the system GMM estimator to fix defects that some models such as Pooled OLS, FEM and REM cannot solve. Therefore, the result is expected to have reliable estimation coefficients with high efficiency. However, each model requires specific tests. With the system GMM, it is essential to test the hypothesis with regard to the auto-correlation of residuals, the suitability of representing variables, the stability of estimation coefficients to ensure their efficiency and the reliability of this model. First, the Arellano–Bond estimator (1991) requires the presence of first order autocorrelation and no second order autocorrelation of residuals. Thus, for the reliable result, it is suggested to reject the null hypothesis in AR1 test and support the null hypothesis in AR2 test. Secondly, the author uses the F-test in order to assess the validity of the model. If p-value is less than 0.05, the null hypothesis is rejected. Thirdly, Sargan-Hansen test is used for testing the over-identifying restrictions. Normally, the Sargan-Hansen statistics is perfect if p-value is equal to 1 and theoretically acceptable if p-value is higher than 0.05 or 0.1. However, according to Roodman (2009), the p-value must be at least 0.25.

4. Results and Discussion

4.1. Descriptive Statistics

The research data is collected from listed companies on the HOSE in the period

Table 1. Descriptive statistics

Variable	N	Mean	Standard deviation	Minimum	Maximum
R_i	1.743	0.0169	0.6059	-2.2381	3.3900
R_m	1.743	0.0194	0.3396	-1.0774	0.8940
R_f	1.743	0.0794	0.0287	0.0415	0.1235
beta	1.743	0.7532	0.4248	-0.4406	2.0543
skew	1.743	1.0892	1.8675	-13.3838	17.9012
kurt	1.743	0.7715	0.4044	-0.7718	1.9512

Source: Data collected from the HOSE and calculated by Stata 12.

2006-2015. Table 1 illustrates descriptive statistics which provide a simple summary about the observations to give an overview of the market in this period.

Table 1 reveals the average return of a portfolio in the period 2006-2015 is 1.69%, lower than the return of market portfolio with 1.94% and much lower than that of risk-free asset with 7.94%. A paradox is, according to Markowitz's modern portfolio theory, a higher-risk asset requires a higher expected return; however, in Table 1, the result is contrary to the theory. Standard deviation of an asset can be used as a measure of risk. In particular, a risk-free asset has a lowest standard deviation at 2.87% but has a highest return. The market portfolio has a lower standard deviation than the research portfolio, 33.96% compared to 60.59%, but has a higher return. Therefore, it can be inferred from the data that the stock market was significantly risky and volatile in that period. The best explanation for this paradox is that in the research period 2006-2015, the Vietnam stock market was affected by the 2008-09 global financial crisis. There was a time when the stock return could reach 339% and could decrease by -224% at another time. Especially, the VN-Index reached its peak in 2007 (the early time period of research) and continuously declined in the following years, with a significant reduction of approximately 51% from March 2007 until the end of 2015. Therefore, the low average return of collected stocks and the market return during that time is reasonable.

4.2. Empirical Analysis

The regression analysis result of model 1 is illustrated in Table 2. With the use of the lag of market interest rate and excess stock return as instrumental variables, the result reveals, the null hypothesis in AR1 test can be rejected whereas that in AR2 test cannot be rejected which means the instrumental variables have been properly used. The F-test whose p-value is less than 0.05 allows the author to reject

Table 2. Regression analysis result of model 1

Variable	Regression coefficient	Standard deviation
Constant	0.2791***	0.0444
Beta	0.3022**	0.1338
Skew	0.1176***	0.0227
Kurt	-0.4518***	0.1325
Obs = 1.255 Prob (F-stat) = 0.000 p-value AR(1) = 0.000 p-value AR(2) = 0.110 p-value Hansen test = 0.279		

, **, * have statistical significance relatively at 10%, 5%, 1%.*

Source: Data collected from the HOSE and regressed by Stata 12.

the null hypothesis that states regression coefficients are equal to 0. In addition, since p-value of the Hansen-test is greater than 0.1, the null hypothesis which states the model is well-defined cannot be rejected. Therefore, the regression result can be used to explain the impact of high moments on the volatility of excess stock return. Specifically, the estimation coefficients for the market risk, skewness and kurtosis are all statistically significant. The market risk factor has statistical significance at 5% level while the skewness and kurtosis are statistically significant at 1%. The magnitude of the impact of these factors is relatively high, more than 10% which is partly reasonable as investing in the stock market during 2006-2015 was clearly risky. With regard to the direction, the market risk and skewness are positively correlated with the excess stock return whereas the kurtosis shows the reverse impact.

To measure the impact of market condition on the explanatory power of higher moments to the stock return, the author adds dummy variable D representing whether the market is in a bull stage or a bear stage. Instrumental variables used in the model are the lag of excess market return, the lag of stock return and the lag of excess stock return. The result illustrated in Table 3 reveals, the regression result of model 2 is appropriate and can be used to explain the empirical result. Most of the regression coefficients are statistically significant at 1% except the intercept and the regression coefficient for the market factor in a bear market have no statistical significance. In a bull market, all risk factors have a positive correlation and are

Table 3. Regression analysis result of model 2

Variable		Regression coefficient	Standard deviation
Constant		0.0450	0.0313
In a bull market	Beta	0.1599***	0.0479
	Skew	0.0548***	0.0206
	Kurt	0.1146***	0.0381
In a bear market	Beta	0.1573	0.1531
	Skew	0.1270***	0.0287
	Kurt	-0.8843***	0.1595
Obs = 1.255 Prob (F-stat) = 0.000 p-value AR(1) = 0.000 p-value AR(2) = 0.325 p-value Hansen test = 0.296			

, **, * have statistical significance relatively at 10%, 5%, 1%.*

Source: Data collected from the HOSE and regressed by Stata 12.

used to explain the volatility of excess stock return. On the contrary, in a bear market, only two higher momentum factors can be used to explain the volatility of stock return. In particular, the skewness is positively correlated with the excess stock return whereas the kurtosis shows the reverse impact.

The system GMM estimator is carried out on 1,255 observations. Instrumental variables used are the market return, the lag of excess market return and the lag of kurtosis in each industry sector. The result illustrated in Table 4 shows the model is well-defined and the instrumental variables are properly used. Regression coefficients of skewness and kurtosis with regard to industry sector factor are still statistically significant. Specifically, the sectors which play an important role in analyzing the impact of higher moments on the excess stock return are Materials, Industrials, Consumer Staples and Financials (most coefficient estimates are statistically significant at 1%). Two sectors whose coefficient estimates have no statistical significance are Health Care and Information Technology. In other sectors such as Energy, the coefficient of skewness is not statistically significant while the kurtosis coefficient has statistical significance at 1% or in Utilities, the coefficients of both higher moments are statistically significant at 5%. With regard to the direction,

Table 4. Regression analysis result of model 3

Sector	Variable	Regression coefficient	Standard deviation
	Constant	0.2048***	0.0142
	Beta	0.1672***	0.0352
	Skew	-0.0647**	0.0299
	Kurt	0.1640**	0.0669
Gics 10	Skew	0.0660	0.0416
	Kurt	-0.5158***	0.1366
Gics 15	Skew	0.1122***	0.0300
	Kurt	-0.8001***	0.0646
Gics 20	Skew	0.0643**	0.0324
	Kurt	-0.6893***	0.0705
Gics 25	Skew	0.1153***	0.0294
	Kurt	-0.5800***	0.0634
Gics 30	Skew	0.1814***	0.0399
	Kurt	-1.5244***	0.0858
Gics 35	Skew	0.0046	0.0155
	Kurt	0.4701	0.3347
Gics 40	Skew	0.2940***	0.0351
	Kurt	-0.5536***	0.1187
Gics 45	Skew	-0.0860	0.0612
		-0.2841	0.1912
Obs = 1.255 Prob (F-stat) = 0.000 p-value AR(1) = 0.000 p-value AR(2) = 0,309 p-value Hansen test = 0,482			

, **, * have statistical significance relatively at 10%, 5%, 1%.*

Source: Data collected from the HOSE and regressed by Stata 12.

the skewness is positively correlated with the stock return in Energy, Industrials, Customer Staples, Health care, Financials and negatively correlated with the stock return in Utilities and Information Technology; whereas, the coefficient of kurtosis is positive in Utilities, Health care and negative in the other sectors. With regard to the magnitude, overall, the risk premium for skewness is lower than that for kurtosis, especially the risk premium for kurtosis in Consumer Staples (-1.52). This result is also appropriate as one problem mentioned earlier in the research is the coefficient estimates may not have statistical significance due to a small number of observations in some sectors.

4.3. Discussion

The study has found the statistical significance of the market risk, skewness and kurtosis in explaining the volatility of excess stock return which is consistent with the majority of previous studies, such as Kraus et al. (1976), Harvey et al. (2000), Agarwal et al. (2008), Kostakis et al. (2012), Hasan et al. (2013). This empirical evidence proves the important role in selecting the capital asset pricing model. In addition to the systematic risk (reflected in beta), investors should also be aware of higher momentum factors - skewness and kurtosis - which are the potential risks investors always have to deal with.

In terms of the direction of impact, the skewness factor has a positive correlation with the stock return, which is consistent with Kostakis et al. (2012), Agarwal et al. (2008). The result infers that increasing the risk of skewness to a portfolio will make the expected stock return rise. Further, that the direction is positive also implies that the research portfolio is at risk. As there are a few stocks with negative skewness in the portfolio, the stock returns may sharply decline in the future. Therefore, it is suggested that the risk should be offset. However, because the research studies on all data collected from listed companies which include stocks with positive as well as negative skewness in the portfolio, the overall portfolio return will be subject to stocks with strong positive return or high negative return. Especially in a bear market, a strong positive return of some stocks may not compensate for the loss occurring when the market goes down frequently with a large amplitude. Consequently, it is essential that the average skewness value stay positive to minimize the risk. The positive direction of skewness impact once again states the market is at risk, so investors should avoid stocks with negative skewness as many as possible. With regard to kurtosis, the risk premium for this factor is statistically significant and negatively impact on the stock return. The result shows increasing the kurtosis risk to a portfolio will make the stock return decline, which is consistent with Agarwal et al. (2008). As a result, investors will benefit from having stocks with a low kurtosis value.

When analyzing the impact of higher momentum factors in correlation with the market condition, the risk premium for skewness still remains a positive impact on the stock return. In which, the impact of skewness in the bull market is less than that in the bear market. Apparently, despite the presence of dummy variable D representing the market condition, the research result remains unchanged. Therefore, investors should build a portfolio with stocks having positive skewness and avoid stocks with negative skewness especially in the bear market, as they will put the investors at risk. On the contrary to the direction of skewness impact, the direction of kurtosis impact is ambiguous. Specifically, in an upward trend, the impact of kurtosis is positive whereas in a downward trend, it is negative. Furthermore, in a bear market, the regression coefficient of kurtosis has a statistical significance and considerable magnitude of impact. It is suggested that the investors should make decisions wisely because increasing the kurtosis risk would lead to a significant decline rather than an increase in the portfolio return.

With the addition of sector factor to the model to examine the explanatory power of higher moments to the stock return, the result still finds the statistical significance of the market risk factor which emphasizes on its important role in explaining the volatility of stock return. With regard to skewness and kurtosis, the result reveals these two higher moments have no statistical significance in sectors with few observations. Five sectors which play a crucial role in explaining the volatility of stock return are Materials, Industrials, Consumer Staples, Consumer Discretionary and Financials. With regard to the direction of impact, except for the Utilities and Energy sector in which the regression coefficient of skewness is low and has no statistical significance; in the other sectors, the coefficient of skewness is positive while the coefficient of kurtosis is negative. This result proves with the presence of sector factor, the market risk has higher level of significance, thus, providing more explanatory power to the volatility of stock return. Further, the research also states that the poorly diversified stock market is one of the reasons why studying on stock pricing is facing many obstacles.

5. Conclusion and Policy Implication

This research finds the impact of high momentum factors on the excess stock return. By using system GMM estimator, this research reveals the crucial role of higher moments on explaining the volatility of the excess stock return. Specifically, the skewness has a positive correlation with the stock return while the kurtosis shows a reverse impact. In addition, the research also identifies the magnitude and direction of the impact of two higher moments on the expected stock return with regard to different market conditions. In particular, in a bull market, all risk factors have positive correlation and can be used to explain the volatility of excess stock return. However, in a bear market, only two higher moments - skewness and kurtosis - can explain the volatility of excess stock return. Specifically, the skewness has a positive impact whereas the kurtosis has a negative impact. Therefore, the explanatory power of higher moments for the stock return in each market condition and the direction of kurtosis impact are not consistent. With the addition of sector factor to the model to examine the explanatory power of higher moments to the stock return, the model still retains its suitability. It is found that Materials, Industrials, Consumer Staples, Consumer Decretory and Financials sector play an important role in analyzing the impact of higher moments on the excess stock return. In the other sectors, neither of the high moments has statistical significance or either of them is statistically significant, but the explanatory power is weaker than that in the five sectors mentioned above.

Based on the research result, the author suggests some policy implications to the investors as well as the policy makers as follow:

First, when examining risk factors, investors should consider the skewness and kurtosis because these two higher moments are the potential risks that they will have to face in the future. It is suggested to apply the CAPM to measure risks and estimate the expected stock return for the best result.

Second, when making investment decisions, investors should avoid stocks with negative skewness and positive kurtosis.

Third, increasing risk may help increase the portfolio return. However, this common belief is only correct for some cases. In the event of the market going down, the investors would better be cautious otherwise they will lose their money.

Fourth, the market regulatory agencies should introduce policy incentives in order to have stocks from a wide range of industry sectors be listed on the exchange and bonds with different maturities which contribute to the development of the secondary market and attract more professional and institutional investors.

Although the research models are found suitable and can be used to explain the empirical results, this research still has some limitations:

First, the models are most applicable in the efficient market with symmetrical information. It is apparent that the Vietnam stock market is still young, the information disclosure is not transparent, price manipulation is not strictly regulated as well as the market portfolio is not well diversified due to the limited number of stocks. Some companies cannot be the representative for a whole industry. These weaknesses can influence the applicability of the research models.

Second, the research data is collected from listed companies on the Ho Chi Minh Stock Exchange and excludes stock listed on the Hanoi Stock Exchange.

Therefore, the result does not represent the entire picture of the Vietnam stock market.

Third, despite being one of the best estimation tools, the system GMM has some disadvantages. For a normal use, this system requires a long-time period of research to select many instrumental variables from the model variables. Although the system GMM allows the use of lag as the instrumental variable, it is better if it allows variables totally different from the model variables to replace the endogenous and exogenous variables.

Fourth, the research focuses on studying the impact of skewness and kurtosis and does not compare this model with the addition of these two higher moments and the three-factor model by Farma et al. (1993) or the four-factor model by Carhart (1997) which is also the weakness of this research.

Based on these limitations, the author suggests some recommendations for further research:

First, with a view to improving the reliability of the research model, it is suggested to increase observations by including data from other stock exchanges and extending the time period of research.

Second, the research should compare different asset pricing models to find the most suitable model for the Vietnam stock market.

Third, with regard to the regression method, although the system GMM is still preferred, it is essential to add more variables such as the firm size, firm value, growth rate, macroeconomic indicators, state ownership share, default risk and corporate debts to find the fitness for the model and diversify instrumental variables.

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