ORIGINAL ARTICLE Received 12 December. 2017 Accepted 28 October. 2018

Open Access Journal
ISSN: 2333-0783

ACADEMIC JOURNAL OF ACCOUNTING AND ECONOMIC RESEARCHES

Vol. 8, Issue 1, 1-6, 2019

Academic Journal of Accounting and Economic Researches

ISSN: 2333-0783 (Online)
ISSN: 2375-7493 (Print)

ajaer.worldofresearches.com

Volatility of the Market Portfolio Return and Volatility of Stock Returns at Different Time Scales

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A B S T R A C T

This study aims to investigate the relationship between the volatility of the market portfolio return and volatility of stock returns at different time scales in Tehran Stock Exchange Was performed. The method of this study is categorized in correlation investigations. Statistical methods used in this study are descriptive statistics and regression. 58 companies have been selected according to defined sampling conditions. In order to test the research hypotheses of the study, separation of beta companies and annual time scales of the model (DCAPM) was calculated. To investigate the relationship between two variables, descriptive statistics, including mean, variance and standard deviation were calculated. The relationship between the independent and dependent variables were examined using regression method. Results showed a significant relationship between market returns and stock returns in different time periods there. And a short period of time the relationship between portfolio return and the highest rate of return to the show. Scale of the short, medium and long-term relationship between portfolio return and volatility of stock returns is confirmed.

Keywords: Volatility- the market portfolio- stock returns- Tehran Stock Exchange.

INTRODUCTION

One of the influential factors on assets returns is risk. Shareholders and investors need to assess their assets stock sensitivity regard to risk. These people are always looking to identify measure and control effective agents on assets return (Bond & Patel, 2003; Harvey, Liechty, Liechty, & Müller, 2010; Simo-Kengne, Miller, Gupta, & Aye, 2015; Wachter, 2013).

Risk and return are two important and influential factors on investment decisions(Cole, Giné, & Vickery, 2017; Liu & Zeng, 2017). In order to reduce risk and increase efficiency, the observation of time series, which their changes can be mark of changes in securities prices, is helpful. Regard to the fact that investors and financial analysts apply return as one of the basic criteria to assess the company's stock, they tend to measure future returns amount, to make decisions about whether invest in shares or hold and sell shares(Bond & Patel, 2003; Mensi, Shahzad, Hammoudeh, Zeitun, & Rehman, 2017).

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To cite this article: BoroomandTombeki, E., AkbarianRounizi, H., Barkhordari, S., Behzadi, R. (2019). Volatility of the Market Portfolio Return and Volatility of Stock Returns at Different Time Scales. *Academic Journal of Accounting and Economic Researches,* 8 (1), 1-6.

Reduction beta compared to traditional beta, can be a better and more accurate predictor of stock future returns (Abbasi, Kaviani, & Farbod, 2017; Fama & French, 2004; Jewczyn, 2014). Through the application of multi-criteria decision and considering some criteria such as the Sharpe index , thinner , annual return, average return, value over the risk , systemic risk , the standard deviation of return , the change percentage in asset net value and etc. Joint investment funds are divided into two groups. After selecting a fund that has the best performance, in the next section by using ideal programming approach, a portfolio is selected from joint investment funds of these two groups(Foster & Kharazi, 2008; Mehrara, Falahati, & Zahiri, 2014).

METHODOLOGY

This study is an applied research and it sought to examine the relationship between market portfolio return fluctuations and stock returns fluctuations in different time scales in Tehran Stock Exchange during the years 2010-2016. The method of this study is categorized in correlation investigations. Statistical methods used in this study are descriptive statistics and regression. In this study, the dependent and independent variables are measured as follows:

The independent variable of the research is the market portfolio return fluctuation and stock expected return fluctuation of stocks individual portfolio is the dependent variable.

Statistical sample of the study is the companies which have all the following conditions:

1. End of the company's fiscal year should be March
2. During the course of the study the Company should have no interruption in the Stock Exchange trading more than six months.
3. Research required information should be available.
4. The company should not be from the investment industry, financial intermediation and holding companies.

58 companies have been selected according to defined sampling conditions. The third requirement is imposed because, if the trading symbol of the company is closed for a long time and its shares are not traded: First, the parameters relating to that share does not have the comparability of the shares that are traded continuously. Second, estimation parameters of it, such as measures of systemic risk would be not statistically significant. Systemic risk indicator based on the time regression between securities returns of the investigated firms and market returns is obtained. Therefore, the existence of trading interruptions longer than usual, leads to situation in which the company's expected return cannot be measured with reasonable accuracy. On the other hand, less than 6 months may result in the removal of large number of companies of statistical sample.

RESULT

Table 1. Descriptive statistics of research variables

Variable name	Average	Std. Deviation	min	max
market portfolio return of first scale (2-4 days)	0.035	0.076	-0.09	0.26
market portfolio return of second scale (4-8 days)	0.009	0.032	-0.08	0.07
market portfolio return of third scale (8-16 days)	0.01	0.031	-0.08	0.14
market portfolio return of forth scale (16-32 days)	0.003	0.009	-0.02	0.02
market portfolio return of fifth scale (32-64 days)	-0.0007	0.003	0.01-	0.01
market portfolio return of sixth scale (64-128 days)	-0.024	0.005	0.02	0.01
expected return rate of first scale (2-4 days)	0.39	0.85	-1.04	2.92
expected return rate of second scale (4-8 days)	0.36	1.16	-2.87	2.73
expected return rate of third scale (8-16 days)	0.55	1.52	-3.95	6.88

Based on the above results, the average of market portfolio return of first to sixth scale respectively are equal to 0.035 , 0.009 , 0.01 , 0.003 , 0.0007, 0.024, and the average of expected return rate of first to six scales are equal to 0.39 , 0.36, 0.55, 0.32, 0.32 and 0.26. standard deviation of the market portfolio return of First to sixth scale respectively are equal to 0.076 , 0.032 , 0.031, 0.009 , 0.003, 0.005 and standard deviation of expected return rate of first to sixth scale are equal to 0.85, 1.16, 1.52 , 0.81 , 0.8 and 0.64.

The least market portfolio return of the first to sixth scale respectively are equal to -0.09, -0.08 , -0.08 , -0.02 , -0.01 and 02 . 0 and the least expected return rate of first to six scales are equal to -1.04, -2.87, -3.95, -1.93, -1.4 and -1.42. Also, the maximum market portfolio return of first to six scale respectively are equal to 0.26, 0.07 , 0.14 , 0.02 , 0.01 and 0.01 and the maximum expected return rate of first to sixth scale are equal to 2.92, 2.73, 6.88, 1.84, 3.4 and 1.95.

The test results of the relationship between market portfolios return fluctuations and stock returns fluctuations at different time scales were according to the following table.

Table 2. (A short-term period of 2-4 days)

ER1: Dependent Variable Method: Squares Least Panel				
Include: 6 Periods Examples range:2010 – 2016 Companies Num:158 Total Views: 58				
t-statistics probability	t-statistics	Standard Deviation	Variables	Coefficients
0.000	7.627282	0.009346	C	0.071284*
0.000	-6.641353	0.000739	B1STDRM	-0.149063*
Dependent Variable Average		0.035	Determination Coefficient	0.440
Dependent Variable Standard Deviation		0.076	Adjusted Determination Coefficient	0.430
Akaike Measure		-2.831	Regression Standard Deviation	0.057
Schwartz Measure		-2.760	Unexplained error sum of squares	0.186
Hanan Queen Measure		-2.803	Logarithm of the likelihood	84.115
F statistics F statistics probability		44.107 0.001	Durbin-Watson statistic	1.729

Based on the results of the following table, the parameter values between the independent variable of market portfolio return and the dependent variable of expected return rate of the second scale is equal to -0.01which is significant at the 95% confidence level.

Table 3. (A short-term period of 4-8 days)

ER2: Dependent Variable Method: Squares Least Panel				
Include: 6 Periods Examples range:2010- 2016 Companies Num:158 Total Views: 58				
t-statistics probability	t-statistics	Standard Deviation	Variables	Coefficients
0.000	5.011099	0.003805	C	0.019067*
0.000	-5.628883	0.000278	B1STDRM	-0.015643*
Dependent Variable Average		0.0094	Determination Coefficient	0.361
Dependent Variable Standard Deviation		0.032	Adjusted Determination Coefficient	0.349
Akaike Measure		-4.434	Regression Standard Deviation	0.025
Schwartz Measure		-4.363	Unexplained error sum of squares	0.037
Hanan Queen Measure		-4.406	Logarithm of the likelihood	130.590
F statistics F statistics probability		31.684 0.000001	Durbin-Watson statistic	1.881

Regard to the significance of the first and second hypotheses relations at 95% confidence, it can be concluded that in the short term there is a significant relationship between market portfolio return and the expected return rate, and the first and second hypotheses are confirmed.

Table 4. A mid-term period of 8-16 days

ER1: Dependent Variable Method: Squares Least Panel				
Include: 6 Periods Examples range: 2010- 2016 Companies Num:158 Total Views: 58				
t-statistics probability	t-statistics	Standard Deviation	Variables	Coefficients
0.0001	4.387031	0.003250	C	0.014256*
0.000	-6.103636	0.000229	B1STDRM	-0.039904*
Dependent Variable Average		0.0105	Determination Coefficient	0.399
Dependent Variable Standard Deviation		0.031	Adjusted Determination Coefficient	0.388
Akaike Measure		-4.562	Regression Standard Deviation	0.024
Schwartz Measure		-4.491	Unexplained error sum of squares	0.033
Hanan Queen Measure		-4.534	Logarithm of the likelihood	134.311
F statistics F statistics probability		37.254 0.000000	Durbin-Watson statistic	1.798

Based on the results of the following table, the parameter value between the independent variable of market portfolio return forth scale and the dependent variable of expected return rate of the forth hypothesis is equal to -0.25which is significant at the 95% confidence level.

Table 5. (A med-term period of 16-32 days)

ER2: Dependent Variable Method: Squares Least Panel				
Include: 6 Periods Examples range: 2010- 2016 Companies Num:158 Total Views: 58				
t-statistics probability	t-statistics	Standard Deviation	Variables	Coefficients
0.0000	8.056237	0.001079	C	0.008692*
0.0000	-7.838885	7.55E-05	B1STDRM	-0.259216*
Dependent Variable Average		0.0032	Determination Coefficient	0.523
Dependent Variable Standard Deviation		0.0090	Adjusted Determination Coefficient	0.514
Akaike Measure		-7.259	Regression Standard Deviation	0.006
Schwartz Measure		-7.188	Unexplained error sum of squares	0.002
Hanan Queen Measure		-7.231	Logarithm of the likelihood	212.517
F statistics F statistics probability		61.448 0.000000	Durbin-Watson statistic	1.815

Regard to the significance of the third and fourth hypotheses relations at 95% confidence, it can be concluded that in medium term there is a significant relationship between market portfolio return and the expected return rate, and the third and fourth hypotheses are confirmed.

Based on the results of the following table, the F statistic value is equal to 10.7, which is significant at a confidence level of 95, and it represents a good estimation. Furthermore, the determination coefficient value and the adjusted determination coefficient of the model are equal to 0.16 and 0.14.

Table 6. (A mid-term period of 32-64 days)

ER2: Dependent Variable Method: Squares Least Panel				
Include: 6 Periods Examples range: 2010- 2016 Companies Num:158 Total Views: 58				
t-statistics probability	t-statistics	Standard Deviation	Variables	Coefficients
0.0007	-3.606682	0.000559	C	-0.002014*
0.0018	-3.271403	4.94E-05	B1STDRM	-0.016148*
Dependent Variable Average		-0.00016	Determination Coefficient	0.160
Dependent Variable Standard Deviation		0.0031	Adjusted Determination Coefficient	0.145
Akaike Measure		-8.794	Regression Standard Deviation	0.002
Schwartz Measure		-8.723	Unexplained error sum of squares	0.0004
Hanan Queen Measure		-8.766	Logarithm of the likelihood	257.029
F statistics F statistics probability		10.702 0.001835	Durbin-Watson statistic	1.932

Based on the results of the following table, the parameter value between the independent variable of market portfolio return six scale and the dependent variable of expected return rate of the six hypothesis is equal to -0.033which is significant at the 95% confidence level.

Table 7. (A mid-term period of 64-128 days)

ER2: Dependent Variable Method: Squares Least Panel				
Include: 6 Periods Examples range: 2010- 2016 Companies Num:158 Total Views: 58				
t-statistics probability	t-statistics	Standard Deviation	Variables	Coefficients
0.0000	-5.626428	0.000974	C	-0.005482*
0.0001	-4.268227	7.92E-05	B1STDRM	-0.033795*
Dependent Variable Average		-0.002	Determination Coefficient	0.245
Dependent Variable Standard Deviation		0.005	Adjusted Determination Coefficient	0.231
Akaike Measure		-7.721	Regression Standard Deviation	0.005
Schwartz Measure		-7.650	Unexplained error sum of squares	0.001
Hanan Queen Measure		-7.693	Logarithm of the likelihood	225.918
F statistics F statistics probability		18.217 0.000077	Durbin-Watson statistic	1.931

Regard to the significance of the fifth and sixth hypotheses relations at 95% confidence, it can be concluded that in long-term there is a significant relationship between market portfolio return and the expected return rate, and the fifth and sixth hypotheses are confirmed.

CONCLUSION

In the first and second hypotheses, the coefficient of market portfolio return respectively, with the value of -0.01and -0.149 were significant at 95% confidence. Regard to the significance of the first and second hypotheses relations at 95% confidence, it can be concluded that in short-term there is a significant relationship between market portfolio return and the expected return rate, and the first and second hypotheses are confirmed. In addition, in short-term the impact on the market portfolio return in the first scale is greater than the second scale.

The conducted studies show that in short-term the relation of market returns on stock returns were higher, due to the lack of analysts' consensus on the share and the behavioral reasons such as skewness of returns(Tong, 2016). However, the relation of market portfolio returns and stock returns in some studies is positive and in some others a positive linear relationship have been refused(Bailey et al., 2004).

In the third and fourth hypotheses, the coefficient of market portfolio return respectively, with the value of -0.039and -0.25 were significant at 95% confidence. Regard to the significance of the third and fourth hypotheses relations at 95% confidence, it can be concluded that in medium-term there is a significant relationship between market portfolio return and the expected return rate, and the third and fourth hypotheses are confirmed. In addition, in medium-term the impact.

In the fifth and sixth hypotheses, the coefficient of market portfolio return respectively, with the value of -0.01and -0.03 were significant at 95% confidence. Regard to the significance of the fifth and sixth hypotheses relations at 95% confidence, it can be concluded that in long-term there is a significant relationship between market portfolio return and the expected return rate, and the fifth and sixth hypotheses are confirmed. In addition, in long-term the impact on the market portfolio return in the six scale is greater than the fifth scale(Kim & In, 2007).

So that in long-term and short term the stock market is more efficient. However, unlike the research results of Shafizadeh[3], the results of this study show that there is a significant linear relationship between the market portfolio return and stock return. Finally, it is suggested that

capital market participants in the study of the relationship between market risk and return of the stock, notice the different time scales.

REFERENCES

Abbasi, Ebrahim, Kaviani, Meysam, & Farbod, Ebrahim. (2017). Testing the Traditional CAPM and MCAPM on Tehran Stock Exchange. *J. Appl. Res. Ind. Eng. Vol, 4*(2), 148-157.

Bailey, Sarah A, Duggan, Ian C, Overdijk, Colin DA, Johengen, Thomas H, Reid, David F, & MacIsaac, Hugh J. (2004). Salinity tolerance of diapausing eggs of freshwater zooplankton. *Freshwater Biology, 49*(3), 286-295.

Bond, Shaun A, & Patel, Kanak. (2003). The conditional distribution of real estate returns: are higher moments time varying? *The Journal of Real Estate Finance and Economics, 26*(2-3), 319-339.

Cole, Shawn, Giné, Xavier, & Vickery, James. (2017). How does risk management influence production decisions? Evidence from a field experiment. *The Review of Financial Studies, 30*(6), 1935-1970.

Fama, Eugene F, & French, Kenneth R. (2004). The capital asset pricing model: Theory and evidence. *Journal of economic perspectives, 18*(3), 25-46.

Foster, Kevin R, & Kharazi, Ali. (2008). Contrarian and momentum returns on Iran's Tehran Stock Exchange. *Journal of International Financial Markets, Institutions and Money, 18*(1), 16-30.

Harvey, Campbell R, Liechty, John C, Liechty, Merrill W, & Müller, Peter. (2010). Portfolio selection with higher moments. *Quantitative Finance, 10*(5), 469-485.

Jewczyn, Nicholas. (2014). *Theory and Portfolios: An economic history of MPT, APT, and the CAPM from 1952 to 1986*: AuthorHouse.

Kim, Sangbae, & In, Francis. (2007). On the relationship between changes in stock prices and bond yields in the G7 countries: Wavelet analysis. *Journal of International Financial Markets, Institutions and Money, 17*(2), 167-179.

Liu, Ximei, & Zeng, Ming. (2017). Renewable energy investment risk evaluation model based on system dynamics. *Renewable and Sustainable Energy Reviews, 73*, 782-788.

Mehrara, Mohsen, Falahati, Zabihallah, & Zahiri, Nazi Heydari. (2014). The Relationship between systematic risk and stock returns in Tehran Stock Exchange using the capital asset pricing model (CAPM). *International Letters of Social and Humanistic Sciences (ILSHS), 10*, 26-35.

Mensi, Walid, Shahzad, Syed Jawad Hussain, Hammoudeh, Shawkat, Zeitun, Rami, & Rehman, Mobeen Ur. (2017). Diversification potential of Asian frontier, BRIC emerging and major developed stock markets: A wavelet-based value at risk approach. *Emerging Markets Review, 32*, 130-147.

Simo-Kengne, Beatrice D, Miller, Stephen M, Gupta, Rangan, & Aye, Goodness C. (2015). Time-varying effects of housing and stock returns on US consumption. *The Journal of Real Estate Finance and Economics, 50*(3), 339-354.

Tong, Eric. (2016). Global financial instability: Why US monetary policy matters. *University of Auckland Business Review, 19*(1), 6.

Wachter, Jessica A. (2013). Can Time-Varying Risk of Rare Disasters Explain Aggregate Stock Market Volatility? *The Journal of Finance, 68*(3), 987-1035.