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Abstract

The finance theory suggests that there might be a relationship between the stock return and the risk premium. Theoretically, stock return defined as the change of the market price, and it is related to the scope of the financial system, which is consisting of the financial institution and financial markets. The way, possibly will be, to contribute the existing literature is to propose a new measurement and this study try to do so. The aim of this study and its motivation is that investigates a new measure of stock return and attempt to establish a new relationship between return and risk premium. To realize this aim, this study uses geometric mean to calculate return and standard deviation, and after all, construct panel data analysis to analyze the return and standard deviation relationship. In this study, seven commercial banks' data analyzed to the relationship between return and standard deviation with panel data analyses between 1991 and 2010. Also, the geometric mean and value relative concept used to estimate return and the monthly stock prices to yearly basis.

Keywords: Asset Pricing, Stock Return.

Introduction

Recent studies that attempt to state a robust relationship between the stock returns and risk premium has documented well before by the academic researchers. Asset pricing papers represent the possible outcome from the relation between the concerned questions about this field till the new comes after analyzed properly and find new evidently robust factors that have a result for suitable to substitute old results with latter. Till today, existing studies used the foundation models to calculate common stocks; however, this study represents the banking sector stock prices to investigate the possible relationship with a risk premium. The existing distinguished between the definitions of the financial system discussed thoroughly in the literature, and the discussion shows how the systems work well with its own features. The selection of the Bank versus Capital Market based financial system is related to the country's own conditions, that is why; this is not the aim of the study to investigate the bank or capital market. Although, the discussion here is to find the best factor not to discuss the previous question, which is the best one for a market to have the highest utility. Of course, it is essential but with its own conditions country tries to figure out their best, because with the proofed pieces of evidence so the same.

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Therefore, whether its bank or capital market, the choice is capital market; because of this study used the institutional factors as banks' share prices to finalize the study for establishing a relation between stock return and risk premium. It is assumed that without a financial market, it could not be sure that the financial system allocates the sources efficiently to the best alternatives. Therefore, this study tries to find the new measurement to create a robust result for estimation of stock return, because this is supporting the view of corporate finance. Although investigating the relationship between stock return and risk premium, it would be helpful for market participants to give the best investment decision for their initial wealth. Although the investor wants to find the best opportunity to guarantee their investment, that is why the banks' stock assumed that providing safe investment opportunity to ensuring for the terminal wealth corresponding their perception.

The banking sector share in the financial system is substantial, because of investor prefer to invest into banks' share in the market; that is why, this study tried to propose results that explain why the investor choose to invest to that share rather than others, mostly. Also, they are a specialized agent that rules the system for serving the purpose of efficiently allocating the sources with solving the problems related to asymmetric information. Therefore, banks in this study choose to understand investors' behaviour to why invest in banking shares. Of course, financial markets represent the direct finance approach it serves to allocate the sources efficiently. However, the financial market and banking sector contributions to the existing system are so different from the concept of the risk issue. The risk-sharing concept created to financial markets, and when someone explains the importance of the financial market, the first component is always risk sharing. Their perspectives, therefore, differ from their features, and this is creating their motivation to serve. That is why just investigating the banking sector side is not enough to write a concluding remark about this research area; also it is crucial to investigate the financial market factors with banks' share such as risk premium are assumed to answer the question mark. The question is to analyse the concern related to study the course of creating value, that is why the relative value concept used in this study. Corporate finance aims to create value with the best decision of allocating the sources efficiently. Any style of a constructed financial system serves this aim to create wealth which is the first concern in the Markowitz (1952) concept. To find the equilibrium for the utility function of wealth is important, why, this is the way to create the value.

Prices are signing for the right information that could be used to give the decision to have the best investment. This is called information-based decision-making process to provide a ground to the rational decision. That is why; always the right address is to investigate in this discipline is the prices. The prices as a source of information that contains the information that is important to participants to the capital market to give their decisions. This is the motivation here to choose the capital market prices to investigate the price effects. Because, always the bank side are highlighted to investigate the features on the economy, because, they are the specialised agent for

solving and managing the money. Although, giving importance to the banking sector in the discipline is the correct way to research, but, if the system constitutes with its entire component, there is a need also to investigate the capital market and prices effects on the commercial banks' stock return for complement this subject. The discipline of corporate finance would point out the importance of banks and capital market to use the sources efficiently. All this explanation for finalising the choice of a subject is, of course, capital market and prices. That is why; the choice of this study is to using the prices of commercial banks to represent return with the risk premium. The following sections are; first, the general background of geometric mean calculation and its follows with the literature review. After that section, it will explain the theoretical framework of the econometric methods to the selection of models and its criteria's; as follow likely:

$$Y = \beta_0 + \beta_1 X_1 + \ldots + \beta_k X_k + e \tag{1}$$

The general formula to calculate return from investment to common stock is

$$\text{Return} = (w_t \,/\, w_{i)} - 1 \tag{2}$$

w_t and w_i have represented the terminal and initial wealth and return is the reward from investment at a holding period. This is the way to calculate return from investment to have return figure. Also, the method to calculate geometric mean to convert the monthly data to yearly, in this study going to use geometric mean and the calculation was as follows:

$$rg = \left(\Pi_{i=1}^{n} \frac{w_t}{w_i} \right)^{1/n} - 1 \tag{3}$$

With these formulas, every single stock's return and its components would be estimated. Therefore, holding period returns going to be calculated and also to the analyses the standard deviation figure added to the econometric modelling part. Theoretically, an investment return calculated by holding period return $[(p_1/p_0) -1]$ and periodic income. In this study, the periodic income components are ignored from the modelling part. That is why; just prices of stocks are used to calculate the geometric means. Civelek and Durukan (1998) state that the geometric mean, however, reflects the reality correctly and arithmetic mean although is more easy to calculate than geometric mean. Nevertheless, geometric mean is an indicator that is calculating the correct average value of a series of holding period return, and the inclination here is to calculate the performance of asset return, therefore; it is assumed that geometric mean giving better results to the regards of arithmetic mean. Therefore, in this study geometric means are used to provide ground to have an accurate decision.

Literature Review

The asset pricing methodology proposes an estimation way to explain the asset return. Theoretically, there are two dimensions of CAPM (Capital Asset Pricing Method) and APT (Arbitrage Pricing Theory) in the literature, broadly. This study follows the CAPM method and proposes a new way of analysis with using the geometric mean against arithmetic mean for calculating return and risk components. Alexander et al. (2001) stated that the capital asset pricing model specifies the relationship between expected return and beta. This model implies that the expected return on an asset is related to the measure of risk, which is beta. After all, the arbitrage pricing theory was stated by Ross (1976) to investigate the effects of various factors on asset return with macroeconomic factors. Also, this kind of theory followed by Alexander et al. (2001) and Chen, Roll and Ross (1986) to examine the validity of APT and analyzed the validity and macroeconomic variables which they are proxies of the underlying risk factors to explain the stock return. Although, this study followed the Sharpe method to assumed that the only risk factor is the standard deviation of the geometric mean. Therefore, the underlying risk factor is the standard deviation of the return. This is meaning that the stock return tried to explain with risk, which is the standard deviation. Various studies investigate the model with the Istanbul Stock Exchange (ISE) (newly Borsa Istanbul). For example, Mısırlı and Alper (2009) investigate the impact on the variation of portfolio excess returns in ISE, and they formed the portfolios according to their size, industry, book-to-market ratio, momentum and coskewness and compare alternative asset pricing models. In this study, the CAPM and three-factor model of Fama and French (lastly Fama & French (2017) was tested. Although there are studies that are investigating the geometric mean calculation on asset pricing methodology. For example, Cochrane (2001) measures the mean likely, arithmetic and geometric mean with CAPM to estimate mean, standard deviation, alpha and beta of venture capital investments, using a maximum likelihood estimate that corrects for selection bias. Its results show that arithmetic average returns and intercepts are much higher than geometric averages.

The Methodology

In this study panel data analysis used to calculate the model for the relationship between the stock return and its standard deviation. A panel data has two dimensions which are time and cross-sectional components. This allows investigating both time and the other components in the meantime. The general formula is;

$$y_{it} = \alpha + \beta\, x_{it} + e_{it} \qquad\qquad (4)$$

The y is a dependent variable which is stock return and x represents the risk factor. The technique of panel data is used for financial modelling that is data comprising the time series and cross-sectional components.

Data and Results

The data observed by the website of Istanbul Stock exchange for the period between 1991 and till 2010 yearly basis to seven commercial banks[1]. The data obtained from the ISE web site was a monthly basis and return of yearly date constructed with geometric mean estimation. After all, the standard deviation estimated by monthly returns used. The results are represented from the reduced-form econometric technique to obtain the best-fitted model of panel data analyses. The panel data analysis model result from the econometric study is:

$$Rg_t = 0.0042 - 0.2688\, rg_{t-1} - 1.2090 std_{t-1} - 0.1382 rg_{t-3} \qquad (5)$$
$$(0.7374)\;(-3.7930)^{***}\;(-35847)^{***}\;(1.9655)^*$$

Observation = 119 R^2 = 0.0.2378 Hausman test = 0.3658   F-stat = 3.7790***

This is the model result and it state that geometric mean and its extension represent best fitted reduce form model result. The return is affected by its lag components and standard deviation. The result that observed above is most of the significant factors to explain the change in stock prices. The Returns are changing by 1 percent with the -1.2 percent changing by the standard deviation. Unfortunately, the constant term which is the least return like the risk-free rate is not significant. The results state that the factors which is analyzed in the model are standard deviation and its lag components determined by the geometric mean. As expected the signs are correct, because of the return affected by the negative risk premium. This is meant that when the risk premium decrease, stock return increase. Consequently, this result depends on this period supporting the view of there is a relationship between return and risk premium that is the concept of trade-off between risk and return.

Conclusion

The purpose of this study is to investigate the relationship between geometric mean which is return and standard deviation. Standard deviation, in this study, assumed that it is the risk premium. The study result supports the view that there is a negative relation between return and risk. The sign of all variables for Banks stocks is negative, because, when the volatility of a stock price is an increase, this is decreasing the risk premium. Although, it could be stated that the investor perception to holding commercial banks is buying and holding philosophy. When the volatility of these stocks are increased, the investors are changing their portfolio combination towards to buy more stable stock to ensure the portfolio return. All independent variables are lagged one and third periods ahead. This is meant that first, the investors actively are

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[1] The commercial banks considered in this study are Akbank, Alternative Bank, Finans Bank, Fortis Bank, Garanti Bank, Is Bank and Yapı Kredi Bank.

monitoring their portfolio with stock prices and then they giving their decision regards to the stock change. Second, investors' incentive to give a decision about their investment related to the past prices to hold more guaranteed investment opportunities. The investor perception to buy a stock depends on their expectation about the future outcome; the theory is managing their investment actively with its volatility. Past records are helping to give a prior decision of future return. Specifically, in this study, the commercial banks' stocks are analysed because of the reason that the investor chooses to hold banks' stock to record high and stable return. However, as a concluding remark, investors actively manage their investment with long purchase.

References

Alexander, G. J., Sharpe, W. F., and Bailey, J. V., (2001), *Fundamental of Investment,* 3rd Edition, Prentice-Hall, Englewood Cliffs, NJ.

Chen, N., Roll, R. And Ross, S. A., (1986), "Economic Forces and the Stock Market", Journal of Business, Vol. 59, No. 3, pp. 383-403.

Civelek, M. A., Durukan, M. B., (1998), *Investment*, Dokuz Eylül Yayınları, İzmir.

Cochrane, J. H., (2001), "The risk and return of venture capital", NBER working paper. No. 8066.

Fama, E. F., & French, K. R. (2017). International tests of a five-factor asset pricing model. Journal of financial Economics, 123(3), 441-463.

Markowitz, H. Portfolio selection, 1952 J. Financ, 7, 77.

Mısırlı, E. U., Alper, C. E., (2009), "Drivers of Expected Return in Istanbul Stock Exchange: Fama-French Factors and Coskewness", Applied Economics, Vol. 41, Issue 20, pp. 2619-2633.

Ross, S. A., (1976), "The Arbitrage Pricing Theory of Capital Asset Pricing", Journal of Economics Theory, Vol. 13, pp. 341-360.