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Systematic Risk on Istanbul Stock Exchange: Traditional Beta Coefficient versus Downside Beta Coefficient

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Extensive Summary

CAPM is such a model which is developed based on Mean Variance Principle and has large area of usage in financial market. One of the important factors for that can be stated as easy applicability of the model. Furthermore, systematic risk can be expressed by just beta coefficient, so it can be also another important reason for large area in usage of the CAPM. Systematic risk which has a considerable effect in the total risk, can not be decreased by portfolio diversification. Therefore, exact expression of the systematic risk has vital importance for investors.

The systematic risk in the CAPM, is measured by beta coefficient. On the other hand, the beta coefficient is calculated based on Markowitz Mean Variance Model which uses variance of returns as risk measure. The variance is a risk measure which requires symmetry in distribution of return. In the calculation of the variance, both of the negative and positive deviations with respect to mean return are taken into consideration and they are included in the risk calculation at same importance level. However, it is believed that the positive deviations on mean return is a gain and the negative deviation is a loss for an investor. In this circumstance, it is not correct to state the positive deviation as a risk for all investor. When the negative deviations with respect to mean return are used in the calculation of the risk, downside risk measures become important. Markowitz (1959) suggests to use semi-variance instead of variance, which is traditional risk measure, in his study about expected loss of investors. He states that, the semi-variance is a more preferable risk measure in such circumstance which has only negative deviations with respect to mean returns for risk measure. The semi-variance does not require symmetry in the distribution.of returns Therefore, it is more reliable as risk measure in all distributions of return regardless of symmetry.

These advancements in finance literature pave the way for development of alternative models to CAPM. D-CAPM is developed as alternative to CAPM. D-CAPM bases on mean semi-variance principle. It uses downside beta coefficient for calculation of systematic risk. D-CAPM takes only the negative deviations with respect to mean

returns into consideration for the calculation of downside beta coefficient. Hogan and Warren (1974) used downside risk concept in CAPM for the first time. Bawa and Lindenberg (1977), Harlow and Rao (1989), Estrada (2002, 2007) are the other researchers who used and contributed the development of downside risk and beta concept later on. In the Turkey, Kaptan and Beker (2011), Korkmaz, Cevik and Gokhan (2012) are the researches who tested D-CAPM.

The main goal of this paper is testing the validity of D-CAPM in the Istanbul Stock Exchange (ISE). Furthermore, it aims to explain the usage of traditional and downside beta values in calculation of systematic risk. In this purpose, CAPM and D-CAPM are used as research model.

This paper is one of the limited numbers of research about testing the validity of D-CAPM in the ISE and it differentiates from other papers in Turkey by its analysis based on assets. In the study, explanatory powers of traditional and downside beta coefficient, which are for the period 1991-2009 in ISE, on systematic risk are examined comparatively. In this purpose, both of the traditional CAPM and the D-CAPM are used. it examines whether traditional beta or downside beta coefficient has more explanatory power on calculating the expected return by the traditional and downside CAPM which are used in the study.

Interest rates of treasury bill, monthly return of ISE-100 index and the monthly return for seventy three stock that are continuously traded on the ISE for selected period are used as data for this study. Excess return values, which are going to be used for both of the two models in the paper, are calculated based on the data collected. Unit root analysis is applied on these excess returns and it is determined that all of the values are stationary. After applying regression analysis, traditional beta coefficient is calculated by using the CAPM and downside beta coefficient calculated by using the D-CAPM for each of the assets. The obtained results showed that D-CAPM is valid on the ISE. Then, the explanatory powers of used risk measures variance, semi-variance, beta and downside beta coefficients on expected return are analyzed. It is investigated whether downside beta coefficient is superior to traditional beta coefficient in ISE by this application. In this way, the paper aims contribute the literature by testing the validity of D-CAPM in ISE on the basis of asset.

The beta coefficient, which is commonly used in calculation of systematic risk, is generally lower than the downside beta coefficient for the assets, which is included in research. When the explanatory powers of these two risk measures on changes in returns are examined, it is obtained that, the explanatory power of downside beta coefficient is superior. The findings show similarity with the study of Estrada (2002, 2007). Downside beta coefficient gives better results for explaining the changes in expected returns of the seventy three assets, which is used in research, compare to traditional beta coefficient. Therefore, it can be claimed that, the downside beta is more successful than beta coefficient for explaining the changes in returns.

When the expected returns are analyzed for CAPM and D-CAPM, it is shown that D-CAPM forecasts 1.15% more expected return compare to alternative model. This has vital importance for calculation of cash flow, which is expected from investment projects. This difference can be a crucial determinant for an investor while approving or denying a project. In conclusion, it can be stated that D-CAPM is superior to CAPM in ISE for the research period.