

論文 / 著書情報
Article / Book Information

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Category(English)	Doctoral Thesis
種別(和文)	論文要旨
Type(English)	Summary

論文要旨

THESIS SUMMARY

専攻:	イノベーション	専攻
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申請学位(専攻分野):	博士	(工学)
Academic Degree Requested	Doctor of	
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要旨 (英文 800 語程度)

Thesis Summary (approx.800 English Words)

Making an investment is a decision-making process. A portfolio that has investable assets with uncertain performance is selected based on an investor's forecasts at the beginning of an investment period. The portfolio is exposed to various economic and market conditions. The portfolio's achieved performance refers to the investment results during and at the end of the investment period, and the performance is evaluated. In this thesis, relations between forecasts at that moment of portfolio selection and measurements that evaluate performance are studied, and the causes of the performance are studied. The investor's forecasts at the beginning of the period are ex-ante forecasts, and it is natural that the forecasts are not necessarily identical to the performance of investable assets during the period. Therefore, the portfolio's achieved performance is brought from the performance of investable assets during the period. The performances of the assets are ex-post realized returns which are observed at the end of the period. This thesis studies the relations between ex-ante forecasts of the future performance of investable assets at the beginning of an investment period and measurements of the portfolio's ex-post performance analysis. Ex-ante forecast returns and risk of investable assets are set as the ex-ante forecasts, and the ex-post realized Sharpe ratio and the information ratio are set as measurements of the ex-post performance analysis.

The ex-post realized Sharpe ratio and the information ratio using an ex-ante forecast return distribution—possibly different from the ex-post realized distribution—are studied. Forecasting power measurements are proposed, as are attribution formulas and methods. The proposed measurements are called predictability-based measurements in this thesis. The proposed methods enable the ex-post realized Sharpe ratio and information ratio to be decomposed into realized market conditions, the ex-ante predictability of returns, the risk magnitude, and the risk factors. The methods enable a fair and direct comparison of the proposed measurement of the ex-ante return and ex-ante risk, quantitative identification of the main source of the reduction in the realized ratios from the achievable ratios. The proposed method performs an excess Sharpe ratio attribution analysis that simultaneously evaluates the qualities of a portfolio and the benchmark.

The first contribution of this thesis is to provide formulas that express relations between the forecasts at that moment of portfolio selection and performance measurements. The second contribution is to provide an ex-post realized Sharpe ratio attribution and an

ex-post realized information ratio of the ex-ante forecast returns and risk. The third contribution is to provide attributions using formulas that enable us to provide various quantitative performance analyses. The formulas are of the ex-post realized Sharpe ratio achieved by the optimal portfolio based on the ex-ante forecast return distribution and of the ex-post realized information ratio achieved by the optimal portfolio based on the ex-ante forecast return distribution. Furthermore, an attribution method of the realized Sharpe ratio and realized information ratio is offered. The methods compare and quantitatively evaluate the ex-ante forecast returns and risk. We decompose the realized Sharpe ratio into the absolute value of the market Sharpe ratio, the predictability-based measurement of the returns, and the predictability-based measurement of the risk, which is decomposed as the predictability-based measurement of the magnitude of the risk and the predictability-based measurement of the risk factors. We also show that the realized information ratio is decomposed into the absolute value of the market Sharpe ratio, the limit by the perfect forecast, the predictability-based measurement of the returns, and the predictability-based measurement of the risk, which is decomposed as the predictability-based measurement of the magnitude of the risk and the predictability-based measurement of the risk factors. Additionally, numerical examples of the attribution analysis are illustrated. We realize that these attribution analyses provide rich information for an investment analysis. Therefore, these analyses may become useful analytical tools for portfolio managers and sponsors.

However, additional research should be performed on theoretical issues and on applications of the properties. For theoretical aspects, an issue is the relation of ex-ante forecast distribution and ex-post realized distribution. A direction of research is an estimation of a stochastic model of the risk structure. Another direction of research is a development of monitoring the behavior of risk structure in short term. These researches may give methods which prevent from reduction of risk adjusted performance measurement. Additionally, they may give ideas of new investment products. For applied aspects, a discussion and analysis of differences between assumptions in this thesis and facts in investment practices are needed. Normal distributions of returns of investment assets and full rank of covariance matrices of risk are supposed. Analysis and evaluation of effects where returns are different from normal distribution are needed. Additionally, enhancement of discussion treating investment assets, which are less liquid or distress, is an issue in application of investment practices. These researches may give more insights in investment practices. Finally, further research is required to develop effective ways to use these properties to analyze different aspects of the investment process and, thereby, enhance the realized Sharpe ratio.

備考：論文要旨は、和文 2000 字と英文 300 語を 1 部ずつ提出するか、もしくは英文 800 語を 1 部提出してください。

Note: Thesis Summary should be submitted in either a copy of 2000 Japanese Characters and 300 Words (English) or 1 copy of 800 Words (English).

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(博士課程)

Doctoral Program

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