University of Zurich[UZH]

An Analysis of Risk-Adjusted Performance Measures when Applied to Structured Products with Asymmetric Payoff-Profiles

Bachelor's Thesis

Submitted in partial fulfillment of the requirements for the degree of Bachelor of Arts in Economics and Business Administration

Author

Benjamin Zimmermann

Supervisor

Prof. Dr. Felix Kübler

Professor of Financial Economics

Department of Banking and Finance

University of Zurich

Assistant

Ally Quang Zhang

Date of Submission: 20. August 2015

Executive Summary

Risk-adjusting performance measures are an essential part of the performance evaluation process. They help investors or asset managers to make performance comparable by adjusting returns for risk components and provide valuable insights into how return on investment was created. Among all performance measures the Sharpe ratio is the most prominent, known and used. It relies on the assumption that returns are normally distributed and therefore mean and standard deviation are suffice to derive the optimal portfolio. And it implies that standard deviation, which measures both the negative and the positive deviations from the mean, is an appropriate measure of risk.

But what if returns are non-normally distributed? And what if an investor weights negative deviations differently from positive ones? Beginning with Mandelbrot (1963), many scientists have shown that asset returns are overall not following a Gaussian curve. As for the measure of risk, a growing literature suggests that negative deviations should be weighted differently than positive ones and therefore standard deviation is an inappropriate measure of risk. In light of this, the question that arises: Can the Sharpe ratio still be used or does it lead to a inadequate ranking of investments?

The present thesis sheds light on four main areas: (a) it expounds the main points of criticism of the Sharpe ratio, (b) it gives a brief review on existing literature/publications for the given topic, (c) it introduces a balanced set of alternative performance measures that claim to make good on the shortcomings of the Sharpe ratio or to be a more adequate performance measure altogether and (d) it applies these measures (together with the Sharpe ratio) on return data from structured products and analyzes the results. The selected products have an asymmetric payoff profile and their returns are in general non-normally distributed.

Drawing from the results from the data analysis, it is shown that an asset ranking with the Sharpe ratio does in fact lead to similar results as other performance measures that assess risk differently or have less rigid assumptions about how returns should be distributed. The conclusion is that for moderate investors the choice of a performance measure does not seem to have an overly crucial influence on the evaluation of distinctive assets like structured products. Therefore, one can conclude that it is (still) appropriate to use the Sharpe ratio to evaluate asset performance - even when applied to distinctive investment products.