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# Risk, Return, Responsibility - Inclusion of ESG Criteria in a Portfolio Optimization Framework

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MASTER'S THESIS

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ARTS IN ECONOMICS AND BUSINESS ADMINISTRATION

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## Executive Summary

Institutional investors, mainly in the pension fund sector, increasingly account for non-financial criteria such as environmental, social and governmental (ESG) factors when it comes to portfolio optimization. Yet, many investors are reluctant to incorporate responsible investment considerations quantitatively in the sense of accounting for a set of criteria that figure as input in a portfolio construction and management process on equal terms with risk and return. Instead, sheer screening methods are prevalent in the industry, where some sort of exclusionary filtering takes place in the first stage, followed by common portfolio management according to mean-variance criteria. In fact, there is a shortage of adequate methods to consider ESG factors integrally. The present thesis rationalizes quantitative integration of ESG measures in portfolio management and discusses existing approaches in the literature, a majority of which is set in the area of Multiple Objective Optimization. It then suggests a novel method based on the Black Litterman model. The suggested framework imposes a structure on the covariance matrix to effectuate weight shifting according to single ESG scores of the portfolio members. Moreover, it enables the investor to calibrate the degree of ESG incorporation and allows for incorporating views on financial performance. The effects of the method on portfolio weights are analyzed empirically. In an out of sample analysis, the weight shifted portfolios generated by implementing the suggested method are shown to exceed the benchmark in terms of portfolio ESG scores. One of the three variations of the suggested method is able to outperform the market in terms of financial performance for the period in consideration.