

# Statistical Aspects of Sustainability in Optimal Portfolio Theory

Vivi Wong\*

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## Abstract

The world strives to satisfy sustainability conditions, such as human rights and environmental protection, among others, nowadays. Hence, investors would find it interesting to know whether investing in ethical portfolios will worsen the investment opportunities, compared to investing in portfolios constructed by both sustainable and unsustainable assets. One can choose to analyze this topic based on classical optimal portfolio analysis, such as studying whether the difference between the minimum-variance frontier of sustainable assets and the minimum-variance frontier of those assets and some additional unsustainable assets is statistically significant by applying mean-variance spanning tests. In this thesis, we used monthly and weekly returns, respectively, of 21 stocks in the OMX Stockholm 30 (OMXS30) index over the period 2008-2019, and we performed four screenings to obtain different numbers of stocks that are considered more sustainable. Mean-variance spanning tests were then applied to study whether the differences between the minimum-variance frontier of all the 21 stocks and each of the minimum-variance frontiers of the assets obtained after screening are statistically significant or not. The results of the spanning tests showed statistically nonsignificant differences between the minimum-variance frontiers. Hence, our study suggests that an investor would not obtain better investment opportunities when she, in addition to the considered more sustainable assets in the OMXS30 index, adds the stocks that are considered more unsustainable into the investment portfolio.

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\*Postal address: Mathematical Statistics, Stockholm University, SE-106 91, Sweden.  
E-mail: [viviwong.96@gmail.com](mailto:viviwong.96@gmail.com). Supervisor: Taras Bodnar.