
*REITs Stock Picking: An UCITS-compliant
Advanced MVO Model*

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[05 JAN 2023]

Abstract

Purpose: the present study aims to provide an integrated stock picking model that conjugates the MVO (Mean Variance Optimisation) approach with the fundamental analysis approach outlined in a previous works by the same authors.

Design / Methodology / Approach: the proposed portfolio optimisation model is qualified as an A-MVO, which stands for Advanced MVO model, i.e.: an MVO model that not only relies on stocks returns time series but also on other inputs, such as fundamental analysis parameters and business ratios. The effectiveness of the proposed model is assessed by means of an empirical study conducted on the European REITs. The empirical study encompasses a backtesting of the optimised portfolio over a 5-year period and a comparative analysis of the performance of said portfolio against that of an equally-weighted portfolio. The optimised REITs portfolio is at last compared to the “footsie” (FTSE EPRA Nareit Developed Europe) in order to assess its overperformance with respect to the real-estate asset class as a whole.

Findings: the outcomes of the empirical study indicate that the optimised portfolio overperforms both the equally-weighted REITs portfolio and the real-estate asset class as a whole, even accounting for the transaction costs.

Practical Implications: the empirical evidence provided by the present study advocates for the utilisation of the proposed picking model.

Originality and Value: the present paper provides a synthesis of the previous works by the same authors and delivers a more comprehensive methodology that encompasses more sources of information and meets more requirements, namely those related to the portfolio diversification. This paper also fills the gap between the mathematical programming – the resolution of the optimisation model – and the data preparation, which is a precondition for the former; to these regards, the recommendations provided in present study pertain to the following data preparation issues: break-in-series, imputation and time series heterogeneity in terms of historical depth.

Keywords: REIT, Mean-Variance-Optimisation, Fundamental Analysis, Asset Allocation

JEL Codes: G110, C61

Paper Type: Research Paper

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I. Introduction

The Data Envelopment Analysis (DEA) picking model for a REITs portfolio proposed by Colecchia & Prandi (2022) is affected by a first shortcoming common to all efficient frontier methodologies in that it is highly selective and does not comply with the funds industry diversification requirements. The above-mentioned empirical study in fact regarded an optimised portfolio consisting of just 13 equally weighted holdings – each one with an allocation weight of 7.7% – thus a portfolio which does not abide by the UCITS (Undertakings for Collective Investments in Transferable Securities) requirements regarding the minimal level of portfolio diversification to achieve.

The second shortcoming of the DEA model in question is that it does not consider the stocks' performance track record: shares with a remarkable past performance and shares with a poor past performance are equally considered since what matters to the model is just the current reading of each fundamental analysis parameters or business ratio featured in its input/output set.

The third shortcoming of the DEA model – with respect to MVO (Mean-Variance Optimised) portfolios – is that the market risk is gauged just in terms of systematic risk (β coefficient). By contrast, especially in case of a minimal number of constituents, the specific risk of the portfolio as a whole cannot be assumed negligible. MVO portfolios have the advantage of keeping the total risk – both market risk and specific risk – under control by incorporating ad-hoc constraints.

The authors of the present paper, in a former work, also provided evidence of the overperformance of an MVO portfolio characterised by variance minimisation and constraints regarding the minimum return to achieve (Colecchia & Prandi, 2021), even though the MVO model in question was not specifically targeted to the REITs asset class. Besides, said former MVO model, as well as the previously mentioned DEA model, was lacking in terms of diversification, being characterised by an average number of holdings slightly below 10. In addition to this common shortcoming, it is worth remarking that basic MVO models present the shortcoming of disregarding the current fundamental analysis parameters of the holdings as they completely rely on the past performance – the annualised return calculated from the price timeseries – in order to estimate the expected return.

The present paper represents a synthesis between the two above-mentioned models in order to overcome the shortcomings highlighted so far. The picking model proposed in this paper in fact is actually an MVO model characterised by constraints inspired by the DEA model, thus relying on fundamental analysis. The proposed model, formulated in chapter 3, is qualified by the authors as an A-MVO model, which stands for “Advanced” MVO model, in that it encompasses further variables than those computed from the historical timeseries. The computation of the input variables involved in the proposed model is discussed in chapter 2, with a focus on the following issues concerning the data preparation:

- fundamental analysis parameters or business ratios partial unavailability, which requires imputation
- accounting principles heterogeneity, which also requires imputation
- break-in-series
- timeseries limited historical depth

Chapter 4 at last characterises the empirical study aimed to assess the overperformance of the optimised portfolio against an equally weighted portfolio over a backtesting period covering the last 5 years. Chapter 5 provides a synoptic view of the outcomes of said empirical study encompassing a comprehensive set of performance metrics.

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