
REITs Stock Picking: An EPRA-compliant Data Envelopment Analysis (DEA) Model

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[20 FEB 2022]

Abstract

Purpose: the present study proposes an effective Data Envelopment Analysis (DEA) model to select an optimal portfolio of European Real Estate Investment Trusts (REITs).

Design / Methodology / Approach: the DEA has been widely recognised as an effective tool for identifying an efficient frontier of stocks. The innovative REIT ranking model hereby proposed is a CCR DEA model which encompasses four distinct categories of input variables: balance-sheet ratios, business performance metrics, market multiples and market risk metrics. The present paper frames also an empirical study aimed to estimate the overperformance of the portfolio built on the DEA efficient frontier.

Findings: the obtained results indicate that the proposed DEA model overperforms the market and that such overperformance is statistically significant. Besides, the subset of the selected REITs is large enough to provide the basis for an allocation strategy.

Practical Implications: the empirical evidence provided by the present study advocates for the adoption of the EPRA (European Public Real Estate Association) metrics as input variables in stock picking models targeted to European REITs.

Originality and Value: with respect to the current DEA literature on the real estate sector, the contribution of this paper consists in its geographical scope – European REITs – and in the adoption of some EPRA metrics which had not been considered in previous academic models.

Keywords: REIT, Data Envelopment Analysis, EPRA, Asset Allocation

JEL Codes: G110, C61

Paper Type: Research Paper

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I. Introduction

The Data Envelopment Analysis (DEA) is a non-parametric methodology designed to rank units or DMUs (Decision Making Units). The units that are economically viable are characterised by the highest-ranking score and are termed “efficient” units. As far as REIT portfolio management is concerned, the efficient units are REITs to be privileged in the stock picking, i.e.: the REITs worth including in a REIT portfolio. The units to be assessed through a DEA model must be initially characterised by means of a set of attributes which in turn are grouped into two categories:

- “Input attributes”: attributes representing costs or risks, such as financial, operational or market risk metrics
- “Output attributes”: attributes representing benefits or opportunities, such as profitability metrics or sustainability metrics

The acceptance of “efficient unit” introduced in the seminal paper by Farrell (1957), and later refined by Charnes (1978), can be exemplified in geometrical terms. From a geometrical viewpoint each DMU represents a point within the space having the input/output attributes as its dimensions. The efficient frontier is the hyperplane, within such space, where the efficient units lie. Such efficient units are given by the DEA model an efficiency score equal to one, which is the maximum possible score. These efficient units have the distinctive property of not being overperformed by any combination of the remainder units, meaning that no combination of inefficient units can be found which delivers an equivalent amount of output while requiring a smaller amount of input.

The DEA methodology, which still resorts to fundamental analysis variables, differs from the traditional fundamental analysis techniques in that it is a “non-parametric” methodology, meaning that the functional form of the relation between the inputs and the outputs is not defined a priori but is revealed by the DEA elaboration itself. The “linear combination of inputs” measured with respect to a given output level in fact involves coefficients – the linear combination coefficients – which are unknown at the beginning and stem from the DEA processing itself. The DEA processing is delegated to an Operation Research engine, an abstract machine devoted to solving optimization problems, namely Linear Programming problems, abbreviated as “LP”.

The DEA marks a definite improvement over the traditional fundamental analysis techniques in that it makes it possible:

- to sort out conflicting indications coming from two or more business ratios (Feroz et al., 2003)
- to include in the assessment incomparable measures such as monetary items, risks/opportunities or compliance metrics.

The next chapter of this paper highlights the main features of the academic papers related to the DEA, focused either on the REITs market or on broader market segments, which have contributed to the formulation of the DEA model hereby proposed.

2. Literature Review

The literature available on the subject of ranking real estate stocks by means of DEA models can be divided into two categories:

- a) ranking targeted to highlight inefficiency issues in order to recommend corrective actions
- b) ranking targeted to the stock picking process.

[...]

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