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Acceptability Analysis: Performance evaluations
of energy companies

Silvia Angilella and Maria Rosaria Pappalardo

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Hierarchy Stochastic Multi-Attribute Acceptability Analysis: Performance evaluations of energy companies

Silvia Angilella
Department of Economics and Business,
University of Catania,
angisil@unict.it

Maria Rosaria Pappalardo
Department of Economics and Business,
University of Catania,
mrosaria.pappalardo@unict.it

Extended abstract ¹

The topic of this paper is the performance evaluation of worldwide listed companies operating in the energy sector, mainly in the gas and electricity market.

Commonly firm's performance are assessed in terms of traditional accounting ratios. Several past studies have been focused on different financial ratios to assess corporate performance and to build failure prediction models [1] and some papers have been specifically addressed to energy companies and utilities [3]. Financial ratios have the advantage to be immediately available from the balance sheet data, but they do not exactly reflect the specific characteristics of utility companies. Consequently, it is important to enrich the studies related to the energy companies, adding to the traditional accounting measures some specific environmental, technical and market criteria, considering their possible implications in terms of performance evaluations [5].

The hierarchical criteria structure is organised under four main dimensions: financial, environmental sustainability, technical and market, and several

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Speaker:[Maria Rosaria Pappalardo; mrosaria.pappalardo@unict.it].

sub-levels, to better refer to those specific segments in which the groups operate: electricity, gas and district heating.

A family of coherent criteria has been built in order to apply a suitable MCDA model, as tool for the whole performance evaluation of the energy companies to better address decision maker's investments. The aggregation of the overall criteria into a unique number, representing all the aforementioned information, is performed through a composite indicator.

Finally, to handle with the issue of weighting in composite indicators, the Hierarchy Stochastic Multi-Attribute Acceptability Analysis (HSMAA) [2] will be implemented. HSMAA methodology has the advantage to take into account both the uncertainty with respect to the weights assigned to the considered criteria (as in the standard SMAA) and the uncertainty with respect to the weights assigned to the considered sub-criteria [4].

Keywords

Energy Market; Firms Performance; Technical Criteria; Composite Indicator; Hierarchy Stochastic Multi-Attribute Acceptability Analysis.

References

- [1] E. I. Altman, Financial ratios, discriminant analysis and the prediction of corporate bankruptcy, *The journal of finance*, **23(4)**,(1968), 589–609.
- [2] D. De Matteis, A. Ishizaka, & G. Resce, The ‘postcode lottery’ of the Italian public health bill analysed with the hierarchy Stochastic Multiobjective Acceptability Analysis, *Socio-Economic Planning Sciences*, (2017).
- [3] M. Doumpos, K. Andriosopoulos, E. Galariotis, G. Makridou & C. Zopounidis, Corporate failure prediction in the European energy sector: A multi-criteria approach and the effect of country characteristics, *European Journal of Operational Research*, **262(1)**(2017), 347–360.
- [4] R. Lahdelma, J. Hokkanen & P. Salminen, SMAA-stochastic multi-objective acceptability analysis, *European Journal of Operational Research*, **106(1)**(1998),137–143. .
- [5] O. Weber, T. Koellner, D. Habegger, H. Steffensen & P. Ohnemus, The relation between the GRI indicators and the financial performance of firms, *Progress in Industrial Ecology, an International Journal*, **5(3)**(2008), 236–254.