

Measuring corporate transparency in sustainability reporting: An information entropy-based approach

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Abstract

Businesses have a key role to play in achieving the sustainable development goals set by the United Nations to protect the planet. Their related operations have major ramifications on the ecological, social, and economic contexts in which they operate. Further, these operations need to be transparent to all stakeholders so that meaningful reporting could be easily accessed and understood by stakeholders. Existing approaches to measuring transparency in reporting are primarily qualitative and do not lend themselves easily to automation. This research looks at how corporate transparency in sustainability reporting can be measured using an information entropy-based approach. The first step in developing such a transparency measure is to build a dictionary of words relevant to the topic of sustainability by applying text analytics on a corpus of sustainability-rich documents. Shannon entropies associated with the probability distribution of the dictionary words relative to the corpus documents are computed and corresponding analysis of variance (ANOVA) tests conducted to evaluate and improve the quality of the dictionary.

This research proposes a measure of corporate transparency in sustainability reporting as the relative entropy (information divergence) between the probability distributions of words in the sustainability dictionary and those in a corporate report. This resulting metric can be applied to compare sustainability reporting of organizations in specific industry sectors, for instance the energy sector which has among the highest greenhouse gas emissions relative to other sectors. The measure and methodology associated with this research may be extended to study corporate transparency in other areas such as accounting or privacy practices of businesses.

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