

Fine-tuning transformer models for M&A target prediction in the U.S. ENERGY sector

E. Vaquero Lafuente; I. Rodríguez-Muñoz-de-Baena; M. Coronado Vaca

Abstract-

This study explores the application of transformer models directly for classification in predicting mergers and acquisitions (M&A) targets within the U.S. energy sector. The primary objective is to evaluate the capability and performance of various transformer-based models in directly predicting M&A target companies, while the secondary objective investigates the relationship between target companies and renewable energy terminology in their annual reports. We present a novel approach to predicting M&A targets by utilizing cutting-edge Natural Language Processing (NLP) techniques, such as fine-tuned transformer LLMs (Large Language Models) for direct classification. We analyze textual data from 200 publicly-listed US energy companies' SEC-filings and employ FinBERT, ALBERT, and GPT-3-babbage-002 as predictive models of M&A targets. We provide empirical evidence on LLMs' capability in the direct classification of M&A target companies, with FinBERT utilizing oversampling, being the top-performing model due to its high precision and minimized false positives, critical for precise financial decision-making. Additionally, while the study revealed key differences in target and non-target report characteristics, it finds no significant evidence that M&A target companies use more renewable energy-related terminology. It is the first paper applying fine-tuned transformer-LLMs to predict M&A targets, effectively showcasing their capability for this task of direct classification as predictive models.

Index Terms- Mergers and acquisitions (M&A); renewable energy; takeover target prediction; green M&A; natural language processing (NLP); transformer models; large language models (LLM)

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