From Transcripts to Insights: Uncovering Corporate Risks Using Generative AI

Summarized by Li Ziming

1 What are the research questions?

This study research the value of generative AI tools in detecting and analyzing the critical aspects of corporate risk such as political, climate, and AI-related risks.

2 Why are the research questions interesting?

Changes in political, environmental, and technological landscape make the existing dictionaries used to quantify various risk types outdated or incomplete. New generation of language models is capable of understanding complex relationships within a text, incorporating the context within which relevant topics are discussed, and making inferences. It provide a useful opportunity to delve deeper into textual data and comprehensively analyze the complex corporate risks.

3 What is the paper's contribution?

This paper contributes to the work on the value of LLMs. Existing literatures have studied the effect of generative LLMs in helping investors analyze complex and unstructured information (Bernard et al., 2023; Lopez-Lira and Tang, 2023; Jha et al.,2023; Eisfeldt et al., 2023; Kim et al., 2023; Chen et al., 2023), while this paper studies LLMs' economic usefulness in risk assessment and risk management.

The paper also contributes to the literature that uses corporate disclosures to construct firm-level measures of risk exposure. In contrast to existing studies that rely on topic-based bigram dictionaries (Hassan et al., 2019; Hassan et al., 2021; Sautner et al., 2023; Chava et al.,2022; Hassan et al., 2020), this study adopts generative LLMs which can understand the deeper context in which bigrams are encountered.

4 What hypotheses are tested in the paper? list them explicitly.

Vast knowledge embedded within LLMs can be used to uncover valuable insights into the intricate corporate risk landscape.

LLMs are not only suitable to interpret the risk-related text based on the context, but also good at expand general knowledge which can effectively summarize risk-related content and make its own assessment or judgment of risks.

5 Do these hypotheses follow from and answer the research questions?

Yes.

6 Do these hypotheses follow from theory or are they otherwise adequately developed? Please explain the logic of the hypotheses (use visualization if possible).

The development of these hypotheses is motivated by the recent literatures which studied the effect of LLMs in analyze information. And the theories are built upon the underlying technology of LLMs, such as word embeddings and Transformer architecture (Vaswani et al., 2017), and its abilities of acquiring massive general knowledge and logical reasoning.

7 Sample: comment on the appropriateness of the sample selection procedures.

This study uses the sample of US publicly traded firms' transcripts available January 2018 and March 2023 from Capital IQ S&P Global Transcript database and exclude some calls which not suitable for research.

8 Dependent and independent variables: comment on the appropriateness of variable definition and measurement (focus on the key dependent and independent variables).

For risk summaries, the study instructs the model to ignore external information sources. For risk assessments, the study instructs the model to make judgments accompanied by narrative reasoning. The risk exposures corresponding to summaries RiskSum and assessments RiskAssess are both measured through the number of words GPT-based function generated divided by the total number of words in earnings call transcript divided into chunks. But there is a question on whether the length of text can represent the information content.

For the volatility of stock price, the study uses two forward-looking proxies: implied volatility and abnormal volatility. Implied volatility is calculated based on the Black-Scholes model and the Cox-Ross-Rubinstein model. Abnormal volatility is the ratio of post-conference call RMSE to pre-call RMSE from the market model residuals.

9 Regression/prediction model specification: comment on the appropriateness of the regression/prediction model specification.

The validity test for firm-level risk measures is based on the association between the risk measures and stock price volatility by regressing the risk proxies on two stock price volatility variables. The model includes firm-level controls and industry and time fixed effects.

10 What difficulties arise in drawing inferences from the empirical work?

It is hard to determine whether each aspect of risk is exclusively associated with its corresponding corporate action, not just proxies for general risk.

11 Describe at least one publishable and feasible extension of this research.

In the further research, LLMs can be applied in many fields such as audit risk identification and companies' ESG performance evaluation.