From Transcripts to Insights: Uncovering Corporate Risks Using Generative AI

1 Research questions

How does generative AI help investors uncover three types of corporate risks(Political, Climate, AI-related)?

2 Why are the research questions interesting?

•Firms may face various risks that is hard to solve by existing conventional approaches (such as the impact of policy changes, significant climate change, etc.)
•Generative language model:
(1) Capable of understanding and generating text in a pretty natural way.
(2) Adapting to various languages and contexts, strong generalization ability.
(3) Efficiency of short term processing of large amounts of text.
•The paper provides a new perspective for generative AI of assessing risk.

3 What is the paper's contribution?

***(1)* Literature on the functional application of LLM**.
Previous literature has shown that LLM has great potential 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*)
The paper adds the economic usefulness of LLM in risk assessment and risk management(AI tools are effective at extracting risk categories).
***(2)* Literature uses corporate disclosures to construct firm-level measures of risk exposure.**
Previous literature: topic-based bigram dictionaries. (*Hassan et al., 2019; Sautner et al., 2023*)
The paper complements these literature by adopting GPT-based technology to analyze risks.
***(3)* The value of general AI for understanding complex topics like risk.**
Previous studies focus on document text information.
This study indicates that LLM utilizes general knowledge to gain insights into corporate risks.

4 What hypotheses are tested in the paper?

H1: The risk assessment, risk summary, and three risk proxy variables proposed in the paper are positively correlated with volatility.
H2: High risk (assessment and summary) is negatively correlated with investment.
H3: There is a positive correlation between the lobbying amount, green patents, AI patents, and their corresponding risk exposure measures.
Yes, these hypothesis are closely related to the questions, and they have been answered accordingly.
•The firm-level political risk exposure and climate change risk exposure of GPT help capture corporate risk, indicating that GPT can conduct informative risk assessments.

•The GPT-based risk exposure measures are useful in explaining firms' investment decisions, and this is consistent with theoretical priors.
•Companies respond to risks captured by our measures by taking actions to mitigate them. The paper views this finding as further evidence of the validity and economic usefulness of GPT-based risk exposures.

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

The paper selects call scripts from 2018 to 2023 because:
•Generating summaries and evaluating each indicator is expensive and time-consuming;
•A considerable portion of the samples are GPT training windows;
•It is characterized by significant changes in political, climate and AI uncertainty.
The data identifies partial textual records of specific speakers, allowing authors to distinguish between speeches, discussion meetings and questions raised by different analysts.

6 Dependent and independent variables: comment on the appropriateness.

The paper establishes detailed and intuitive important variables: including three risk proxies variables, and their(*assessment* and *summary*); establishment of *abnormal volatility* and *implied volatility*; *investment*, *response* (as dependent variable), etc.

7 Regression model specification: comment on the appropriateness.

Regression models address the assumptions in the article, and they are used to compare the predictive ability of risk measures generated by AI with traditional methods.

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

Main sample overlaps with the GPT model's training period, which extends to September 2021. It is possible that GPT had seen the transcripts of earnings calls during its training, which may give the model an edge in generating risk summaries and assessments.

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

GPT results may be sensitive to prompt quality, and prompt engineering has become an important starting point. Future research may focus on the application of prompt engineering. (For example, the application of Tree of Thoughts Prompting (TOT) and Python risk assessment).

References

[1] Bernard, D., Blankespoor, E., de Kok, T., Toynbee, S., 2023. Confused readers: A modular measure of business complexity. University of Washington Working Paper.

[2] Lopez-Lira, A., Tang, Y., 2023. Can chatgpt forecast stock price movements? return predictability and large language models. arXiv preprint arXiv:2304.07619.

[3] Jha, M., Qian, J., Weber, M., Yang, B., 2023. Chatgpt and corporate policies. Chicago Booth Research Paper.

[4] Eisfeldt, A.L., Schubert, G., Zhang, M.B., 2023. Generative ai and firm values. Technical Report. National Bureau of Economic Research.

[5] Kim, A.G., Muhn, M., Nikolaev, V.V., 2023. Bloated disclosures: Can chatgpt help investors process information? Chicago Booth Research Paper.

[6] Chen, Y., Kelly, B.T., Xiu, D., 2023. Expected returns and large language models. Chicago Booth Research Paper.

[7] Hassan, T.A., Hollander, S., Van Lent, L., Tahoun, A., 2019. Firm-level political risk: Measurement and effects. The Quarterly Journal of Economics 134, 2135–2202.

[8] Hassan, T.A., Schreger, J., Schwedeler, M., Tahoun, A., 2021. Sources and transmission of country risk. Technical Report. National Bureau of Economic Research.

[9] Sautner, Z., Van Lent, L., Vilkov, G., Zhang, R., 2023. Firm-level climate change exposure. The Journal of Finance 78, 1449–1498.

[10] Chava, S., Du, W., Shah, A., Zeng, L., 2022. Measuring firm-level inflation exposure: A deep learning approach. Available at SSRN 4228332 .

[11] Hassan, T.A., Hollander, S., Van Lent, L., Schwedeler, M., Tahoun, A., 2020. Firm-level exposure to epidemic diseases: Covid-19, SARS, and H1N1. Technical Report. National Bureau of Economic Research.