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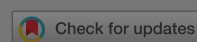
Research Note

Corporate Risk Disclosure and Audit Fee: A Text Mining Approach

Rong Yang , Yang Yu, Manlu Liu & Kean Wu

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Abstract

The aim of this study is to introduce an innovative text mining approach to assess firms' risks using unstructured textual disclosure from annual reports. Specifically, we use Natural Language Processing techniques to extract firms' self-identified risks including financial, strategic, operational, and hazard risks based on an enterprise risk management framework. We examine the association between these four risk

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Notes

- 1 Unstructured data refer to information that either does not have a pre-defined data model or is not organized in a pre-defined manner. It is typically text-heavy and often includes multimedia content. While some files may have an internal structure, they are still considered unstructured because the data do not fit in a database (Feldman & Sanger, [2007](#)). In contrast, structured data like spreadsheets are easily searchable by basic algorithms. Therefore, it is more difficult to analyze unstructured textual documents than structured ones.
- 2 The number of observations drops by 10,266 due to the calculation of RESTPROB and ACCR. In untabulated analysis, we re-run our tests excluding these two variables and the results still hold.
- 3 In the main analysis, we use industry-adjusted risks, measured as the difference between the number of risk sentences from the risk factor section and the industry-median of the sentence count number based on the three-digit SIC industry code in a given year. In the untabulated robustness check, we also use raw risks, measured as the count number of risk sentences from the risk factor section. Our results remain qualitatively similar.
- 4 In addition, we recalculate the number of risk sentences for the sample period from 2003 to 2015. Following the methodology of prior studies, we use the first sentence of the risk factor section as the risk sentence. Our results are robust to this definition. For example, we find that firms with a higher number of risk sentences have a higher risk score in the year 2003. In

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untabulated tests, our main results presented in [Table 5](#) remain almost identical no matter we code ICMW using IC weakness under SOX 302 in 2003 or for the entire sample period.

6 For example, one standard deviation of increase in financial risk for a median firm is related to increase in audit fee by \$18,256 ($\$1,005,504 \times 0.001 \times 18.156$).

7 The insignificant coefficient on the hazard risk could be the results of imprecise estimation due to the low variance of independent variables.

Additional information

Funding

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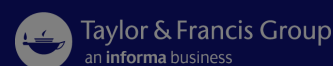
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