When the AI Read Non-financial Information: Machine Readability of ESG Reports and Post-Earnings Announcement Drift

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Abstract: In the context of machine-assisted human information processing, our study examines the impact of ESG machine readability on post-earnings announcement drift (PEAD) using a comprehensive sample of Chinese A-share listed firms from 2009 to 2021. Considering machine processing techniques for multimodal information, we construct a novel index to quantify the machine readability of ESG disclosures by capturing structural, visual, and linguistic characteristics of the reports. The results show that higher ESG machine readability significantly weakens PEAD, suggesting that machine-readable ESG disclosures improve the pricing efficiency of the capital market. This effect is more pronounced among firms with weaker information environments, such as those with lower analyst coverage, fewer institutional site visits, and less specialized auditors. Moreover, the mitigating effect of machine-readable ESG disclosures on PEAD is stronger in the presence of negative earnings news. Additional tests reveal that ESG machine readability is more effective than human readability in reducing PEAD. Our findings highlight the importance of machine-compatible disclosure practices and offer new insights into the informational value of non-financial reporting.

Key words: ESG machine-readability; post-earnings announcement drift

(PEAD); market pricing efficiency