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Leveraging Multisource Heterogeneous Data for Financial Risk Prediction: A Novel Hybrid-Strategy-Based Self-Adaptive Method

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Abstract

Emerging phenomena of ubiquitous multisource data provide promising avenues for making breakthroughs in financial risk prediction. While most existing methods for financial risk prediction are based on a single information source, which may not adequately capture various complex factors that jointly influence financial risks, we propose a hybrid-strategy-based self-adaptive method to effectively leverage heterogeneous soft information drawn from a variety of sources. The method uses a proposed new feature sparsity learning method to adaptively integrate multisource heterogeneous soft features with hard features and a proposed improved evidential reasoning rule to adaptively aggregate base classifier predictions, thereby alleviating both the declarative bias and the procedural bias of the learning process. Evaluation in two cases at the individual level (concerning borrowers at a P2P lending platform) and the company level (concerning listed companies in the Chinese stock market) showed that, compared with relying solely on hard features, effectively incorporating multisource heterogeneous soft features using our proposed method enabled earlier prediction of financial risks with desirable performance.

Keywords: Financial risk prediction, soft information, ensemble learning, hybrid learning strategy, adaptive integration, adaptive aggregation