FORECASTING IPO RETURNS USING FEATURE SELECTION AND ENTROPY-BASED ROUGH SETS

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Abstract. *This study examines methods of forecasting initial returns on initial public offerings (IPO) in Taiwan stock trading systems. In practice, the noise caused by changing market conditions and financial environments requires investors to consider more market variables. However, conventional forecasting methods such as statistical methods require a strict assumption of probability density function, which may not adequately reflect actual market conditions. Hence, to overcome the limitations of conventional methods, this study proposes a novel method of using feature selection and entropy-based rough sets to classify IPO initial returns. The proposed procedure is illustrated by examining an IPO dataset for publicly traded electronics firms in Taiwan. The experimental results of the IPO dataset analyses indicate that the proposed procedure outperforms listing methods in terms of accuracy, number of attributes and number of rules. Further, the proposed procedure generates a set of easily understood rules that can be readily applied in knowledge-based investing systems.*
Keywords: Rough sets, Initial returns, Feature selection, Minimize entropy, IPO

1. **Introduction.** Stock market investors have long used various methods of forecasting superior investment targets with benefits over time. The two methods of stock forecasting are technical analysis and fundamental analysis [1]. Technical analysis examines historical data to identify correlations between volume and price that reflect the buying and selling behaviors of investors. Thus, time-series and pattern recognition are usually applied in forecasting future stock prices or trends [2]. Conversely, fundamental analysis focuses on external and internal environments of specific firms. The external environments encompass macroeconomics (e.g., exports, money supply, interest rates and inflation rates), unemployment figures and global economics. Further, the internal environments include the accounting variables and financial status of a firm such as price-to-earnings ratio, dividend yield, current ratio, earnings per share, price-to-book ratio, book-to-market ratio, return on equity and size of the firm [3]. Briefly, technical analysis is preferred for short-run prediction; fundamental analysis is widely used for intermediate- or even long-term investment planning. Fundamental analysis is used as classify attributes in this study for two reasons. Firstly, according to a study by Ibbotson *et al.* [4], fundamental analysis is rarely used to forecast stock price for short-run; secondly, historical data for pre-IPO share volume and price is unavailable. Therefore, this study employs fundamental analysis to extract meaningful decision rules for forecasting initial investor returns on IPO.