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# A FUZZY-BASED ROUGH SETS CLASSIFIER FOR FORECASTING QUARTERLY PGR IN THE STOCK MARKET (PART II)

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Abstract. *Three hybrid models are proposed for solving the practical problems of forecasting quarterly PGR (profit growth rate) and based on six essential components: experiential knowledge (EK), feature selection method (FSM), discretization method (DM), fuzzy set theory (FST), rule filter (RF) and rough set theory (RST). Following the Part I (the previous paper), a called PGR dataset collected from the financial holding stocks in Taiwan's stock market is implemented as the empirical case study in the Part II (this paper) to evaluate the proposed hybrid models. An external comparison and internal comparison are conducted; concurrently, some findings and management implications are disclosed from the experimental results. The results include decision rules of a set to directly rule the strategy of investment and intelligently offer a powerful explanation for the investors. They are of value to both academicians and practitioners.*
**Keywords:** Rough set theory, Fuzzy-rule similarity, Profit growth rate (PGR), Feature selection, Discretization method, Minimize entropy principal approach (MEPA)

1. **Introduction.** From the Part I (the previous paper) of the study, we had noted that continually increasing the needs for searching a better way to help investors survive in a serious environment, such as globally keener, competitive, and dynamic financial climate, the Asian Economic Crisis in 1997, or a global financial crisis in 2007-2009, is an increased trend today. Therefore, understanding the financial status and operational performance of a specific company through an indicator is needed urgently from various perspectives for them. In practice, one of the most effective ways to assess operating performance of companies is to conduct a profitability analysis. With the view of stock investors, profit growth rate (PGR) is one of core financial ratios and is an effective evaluation indicator. However, academicians rarely explore it in an academic study to forecast stock price for a short- mid run. The study aims to fill this knowledge gap. As such, the study proposes three intelligent hybrid models based on rough sets, which include experiential knowledge, feature selection methods, discretization methods, rule filter, fuzzy set theory and rough set theory, for classifying quarterly PGR problems faced by investors. Likewise, following the Part I, the four research objectives are emerged: (1) Conduct three suitable hybrid models to use fewer selected attributes, fewer generated rules, higher accuracy, and more stability on forecasting; (2) Examine the determinants of influencing the quarterly PGR; (3) Evaluate the effects of basic components; and (4) Generate comprehensive decision rules as knowledge-based systems for investors.