Exploring seasonality effect of multinational stock dynamism with fuzzy theorem, seasonal moving window and artificial intelligence approach

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Abstract

We propose a hybrid approach of fuzzy theorem, support vector regression, genetic algorithm, and seasonal moving window to explore seasonality effect for the stock indexes in five developed and three emerging markets. First, we uses fuzzy c-means, fuzzy relation composition and defuzzication methods to select number of trading days (NTD) used to calculate the value of technical indicators for each market. Then, we utilize genetic algorithm to locate the approximate optimal combination of technical indicators. Then the property of nonlinearity and high dimensionality of the support vector regression is employed to explore the stock price patterns. We also adopt seasonal moving window to capture the seasonality effect of stock market returns. We find that the NTD of technical indicators in different stock markets and the technical indicators affecting various stock markets are different. Our results suggest that the optimal trading rule in a specific stock market is not necessarily applied to another market.

Keyword：Fuzzy c-means, Genetic algorithm,Moving window, Stock market, Vector support regression.