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A real-time adaptive trading system using genetic programming

M.A.H. dempster & C.M. Jones

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Abstract

Technical analysis indicators are widely used by traders in financial and commodity markets to predict future price levels and enhance trading profitability. We have previously shown a number of popular indicator-based trading rules to be loss-making when applied individually in a systematic manner. However, technical traders typically use combinations of a broad range of technical indicators. Moreover, successful traders tend to adapt to market conditions by 'dropping' trading rules as soon as they become loss-making or when more profitable rules are found. In this paper we try to emulate such traders by developing a trading system consisting of rules based on combinations of different indicators at different frequencies and lags. An initial portfolio of such rules is selected by a genetic algorithm applied to a number of indicators calculated on a set of US Dollar/British Pound spot foreign exchange tick data from 1994 to 1997 aggregated to various intraday frequencies. The genetic algorithm is subsequently used at regular intervals on out-of-sample data to provide new rules and a feedback system

is utilized to rebalance the rule portfolio, thus creating two levels of adaptivity. Despite the individual indicators being generally loss-making over the data period, the best rule found by the developed system is found to be modestly, but significantly, profitable in the presence of realistic transaction costs.

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