



Guest Editorial

Special issue on computational intelligence in economics and finance

All five of these papers are dealing with three active application areas of computational intelligence. The leading article by Armano et al. is an application of CI to financial engineering, more specifically, financial time series forecasting. The authors develop a guarded experts framework for the artificial neural networks. The idea of guarded experts is shown to have long been pursued throughout the history of machine learning. In this paper, the authors build the guards with the extended classifier system and evolve the system with genetic algorithms. When applying this hybrid system to trading, the authors show its superior performance relative to the buy-and-hold strategy.

The next three papers contribute to *agent-based artificial financial markets* on different aspects. The paper by Izumi, Nakamura and Ueda pioneer a research direction for agent-based artificial financial markets, i.e., to ground the agent-based modeling in a *field study* of real investors' behavior. It was shown that this evidence could lend support to using genetic algorithms to model the artificial adaptive traders. Kurumatani et al.'s artificial stock market build upon on the X-Economy signifies another important research direction in this area. They provide a platform to allow for the competition of different trading strategies, either was manually programmed or supplied by users. As a result, formula traders and real traders can compete within this arena. Their simulations shows that the survival of a specific class of trading strategies may be sensitively dependent upon the population structure of other co-existing trading strategies. It may help explain why investors cannot count on any kind of trading strategy, despite its lucrative performance in a specific period. To survive well, adaptation through evolving trading strategies is a definite way to go.

Chen and Liao's paper examines one of the most important properties in stock markets, i.e., the price–volume relation. The rich microstructure data provided by the agent-based model enables them to examine whether this relation is consistent between the micro and macro level. What turns out to be

interesting is that the price–volume relation observed in the macro level can emerge from a market where no one actually used volume in their forecasts of returns. Genetic programming was applied to model the adaptive traders, and the linear and non-linear Granger causality tests were applied to test the price–volume relations as an emergent computation.

The last paper by Alkemade et al. demonstrates an agent-based modeling of game theory. In this case, it is the familiar N-person iterated prisoner's dilemma game. Using evolutionary algorithms, the authors are able to show the importance of tagging mechanism in the formation of stable cooperative societies.

Paul Wang

Department of Electrical and Computer Engineering

Duke University, Box 90291

Durham, NC 27708-0291, USA

Fax: +1-919-660-5293

E-mail address: ppw@ee.duke.edu

Shu-Heng Chen

Department of Economics

AI-ECON Research Center

National Chengchi University

64, Chih-Nan Rd., Sec. 2, Taipei

11623 Taiwan, ROC