摘要

因應電子化交易興起而進行的一系列人機互動研究顯示, 縱使人類會透過學習而改善其表現, 電腦化的交易程式獲利能力還是遠勝於眞人交易者之表現。本研究遂以遺傳規劃演算法作爲學習型交易者之代表, 與一系列電腦化交易策略相競爭, 以探討學習的功效及其限制。

本研究採用離散型雙方喊價機制, 摒除了計算能力所造成之決策時間差異所會帶來的影響, 亦排除掉人類情緒、預期、相關知識不足等可能因子, 在計算能力對等的情況下, 單純地來評估學習與理性設計策略的結果。並且首次嘗試將影響學習至鉅的智商因子帶入模型之中,

實驗結果顯示學習具有相當的能力, 即使是在對環境缺乏認識的情況下, 隨著時間的經過其表現最終可凌駕理性設計的策略之上, 然而學習所需的時間是學習型交易者的一大弱點。同時, 本研究也顯示對於以遺傳規劃建構的學習型交易者而言, 其虛擬智商的參數愈高, 學習的效果也愈佳。此研究因此可作爲未來在代理人基經濟學模型中, 更深入地探討智商水準不同所造成之行爲差異的基礎。

關鍵字: 代理人基計算經濟模型, 雙方喊價市場, 交易策略, 學習, 智商, 異質性個體

The study of a series of human-agent interactions as well as computerized trading tournaments in double auction markets has exhibited a general superiority of computerized trading strategies over learning agents. The ineffectiveness of learning motivates the study of learning versus designed trading agents in this research. We therefore initiates a series of experiments to test the capability of learning GP agents and rationally-designed trading strategies. The results shows that with the cost of time, eventually learning agents can beat all other trading strategies.

At the same time, the notion of intelligence is introduced into the model to invesetigate the influence of individual intelligence on learning ability. We utilize the population size of the GP trader as the proxy variable of IQ which is a measure of general intelligence. The results show that individuals with higher intelligence can perform better than those with lower intelligence, which manifests its importance discovered in Psychological research.

Keywords: Agent-based Computational Economic Models, Double Auction Markets, Trading Strategies, Learning, IQ, Heterogeneous Agents