

## Social Learning in Financial Markets

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The strategies in financial markets are often based upon information aggregation. In fact, the traders use and share news to address their behaviours and tune the composition of their portfolios. Our research question concerns the possibility to obtain plausible prices trends, and a sufficient number of trades, through the interaction of agents that have a limited information level, i. e. the market prices and some informal chatting among them.

This paper will focus on the role of suggestions interchange and social learning in the traders' decision making process. A focused decision algorithm has been built to drive agents actions, by exploiting the "memetic" paradigm, like it is described in Dawkins, and the knowledge about the humans being mind processes supplied by the neuro sciences. Such an algorithm could be pretended to support a kind of social learning due to the evaluation and evolution phases. During the first phase, the received suggestions, as well as own ideas, are given a value strictly related to their expected performance, whereas in the second phase, better ideas are chosen to be amalgamated to obtain useful inferences. In this way each agent's knowledge evolve toward better performances and, consequently, its suggestions become more useful; since each one's suggestion is spread it could improve other agents knowledge bringing the learning process at a social level.

In a mechanist description a market could be drawn as a crowd of people interested in trading stocks, and earning money, with heterogeneous beliefs or expectations on shares trends. They send orders to the market where a routine enqueues, arranges and matches those orders. The matching, or the realization of exchanges, shapes the prices. Such people are always adapting their behaviours accordingly with the information brought by the prices and those obtained from several channels. The stock market has been traditionally considered very sensible to the information spreading, even simple rumours.

To perform the research an Agent Based model has been employed, following works of Lux and Marchesi, Arthur, Le Baron, and more recently, of Farmer, Solomon Muchnick, Scalas, Raberto, Terna, Pellizzari, Dal Forno and Bottazzi. Our platform SumWeb is able to reproduce both Milan and NYSE stock market queuing machinery. Artificial agents into the simulation are representing professional traders which information sources have been limited to the price level, but they can informally chat among them.

Early results confirmed the positive answer to the research question: agents with limited information have been able to submit orders capable to maintain alive the market with a plausible price trend, even if no liquidity providers neither market makers have been employed. An evident attribute of our agents is "docility" or, according to Simon, "the tendency to depend on suggestions, recommendations, persuasion, and information obtained through social channels as a major basis for choice".