

AUTONOMOUS AGENTS AND MULTI-AGENT SYSTEMS

WALL STREET BETS

THE GAME

Group 56

AGENT ARCHITECTURE

RANDOM AGENT

Serves as baseline; Buys, sells and holds randomly

SIMPLE TREND FOLLOWER

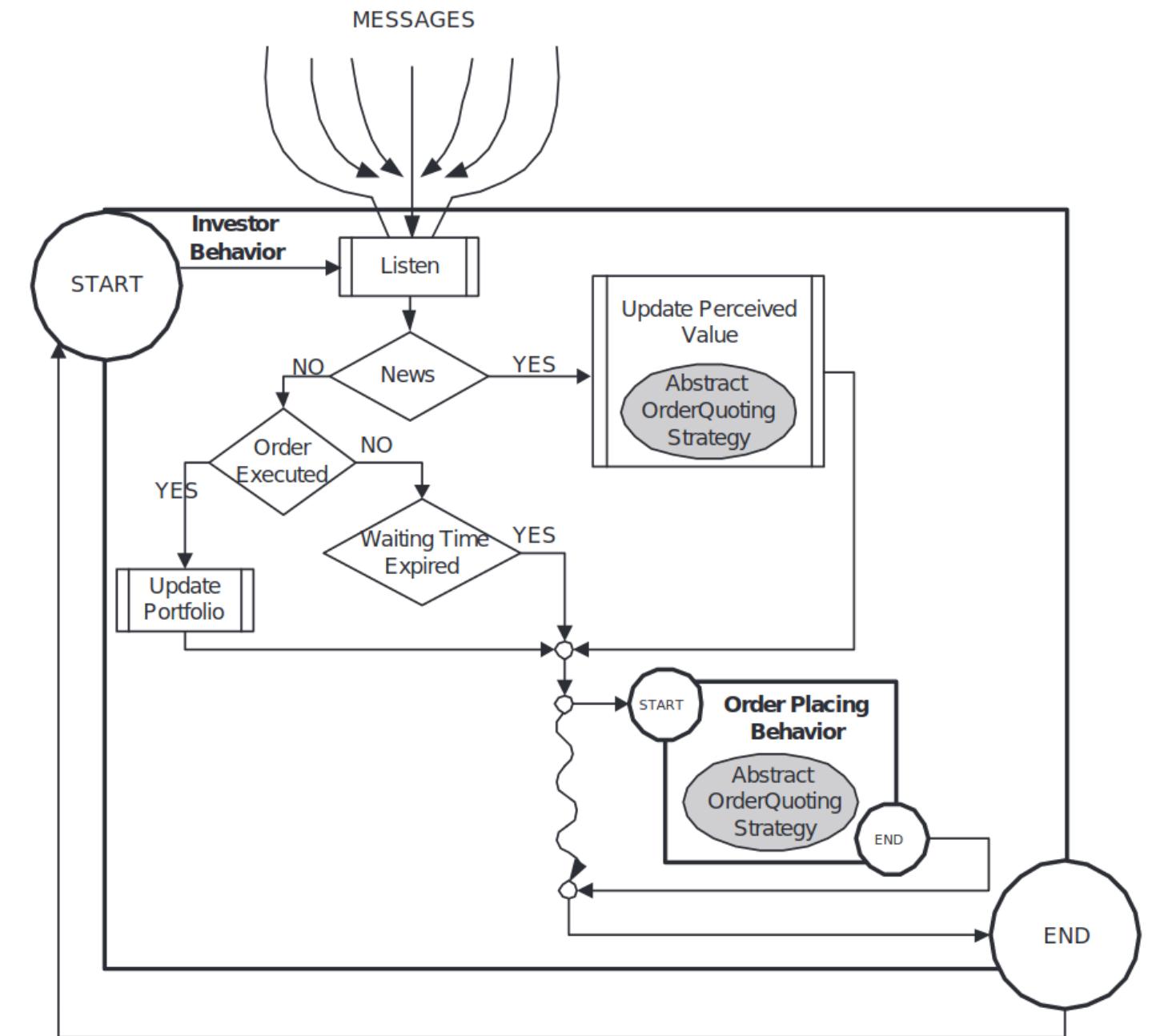
Reacts to immediate changes in stock price

CAREFUL TREND FOLLOWER

Waits a few rounds before seeing a trend

REINFORCEMENT LEARNING AGENT

$$agentValue = moneyValue + \sum_{s=firstShareName}^{lastShareName} valueOfShare(s)$$



Description of an investor agent
(Katalin Boer-Sorban, 2008)

SCENARIOS

When simulating the game we are be able to choose a scenario



Default



Recession



Inflation

FACTORS THAT INFLUENCE SHARE PRICE

Separately from their basic behaviour, share prices might fluctuate due to other factors

- Supply and Demand
- Global Events
- Competitive companies
- Complementary industries
- Random shares

Metrics



AGENT SHARE VALUE



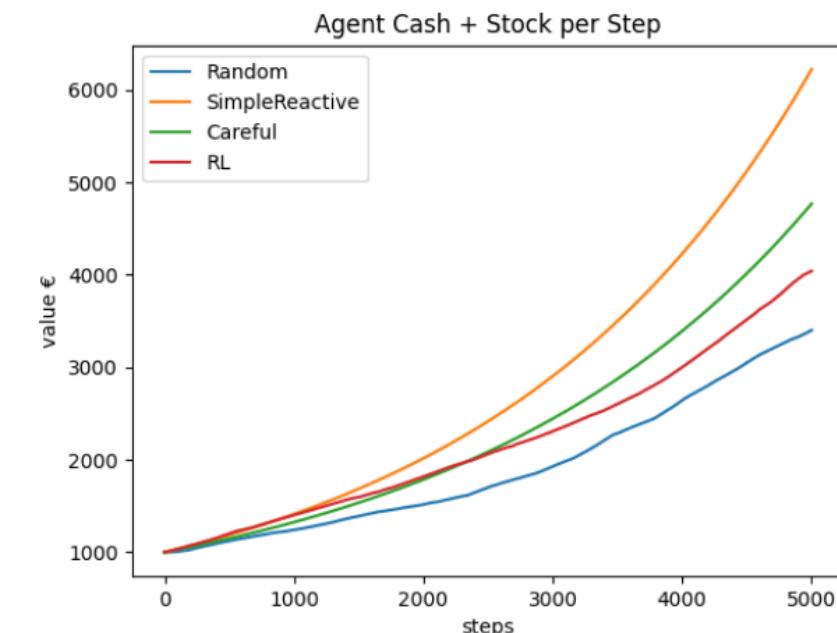
AGENT MONEY



AGENT VALUE

$$agentValue = moneyValue + \sum_{s=firstShareName}^{lastShareName} valueOfShare(s)$$

Figure 10. Average performance of Agents in Inflation Scenario (in 10 runs)



The graphs presented were the results of the average of 10 runs of the game

CONCLUSION

WHAT WE LEARNED

- The **Reactive agents** in general behave well in this type of environments (in accordance to the reviewed literature)
- The **simple reactive agents** performs better than the careful agent in Default Scenario but also loses by not seeing long term (if a certain stock is very unstable)
- The **Reinforcement Learning** agents perform better in low entropy scenarios (e.g. recession and inflation)



Table 1. Average agent value after 5000 steps in Default Scenario in 10 games

Rank	Agent	Avg. Value
#1	Simple Reactive	9914
#2	Careful	9686
#3	RL	3652
#4	Random	3481



THANK YOU!

*ALL LITERARY REFERENCES CORRESPOND TO THE REFERENCES IN OUR REPORT
IMAGES FROM CANVA*