

Report 1: Examining the impact of antifragility and networked based decision making on the stock market

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I. CURRENT STATUS

Research has been done on the topic of modeling the market as a complex network. Of the two common approaches for modeling the market, the team is taking the approach of modeling the market as a network of brokers. Papers that are being pulled from are noted in the references. Metrics such as Pearson Correlation Coefficient and mutual information rate for evaluating the relationships of stocks have been considered. Further, different methods of analyzing risk have been examined. The current thoughts are evaluating risk as a weighted combination of percentage of total investments, dividend versus value stocks, large cap and small cap ratios, and a risk reward ratio. Both the risk and the number of friends are modeled as fat tailed distributions to resemble the real world.

Further, data has been collected and formatted to be selected by start date and rate of trades. The input for the data into the simulation is being examined.

Additionally, a Broker class has been developed that includes functions for updating status every turn and evaluating the risk based on the influence factor from neighbors. This class has been added to networks and random influence weights assigned. This can be viewed in Figure 1. The edges of the graph are directed as influence of one broker on another could go either way and are weighted according to the influence this broker has. The influence factor has been decided to affect the risk tolerance for individual stocks. If the neighbors report a lower value of risk for a certain stock, the Broker lowers their assessment of the risk for that stock. Further, the number of connections per broker is determined by a power law distributions. The influence is initially set to be uniform and set to shift based on performance of agents.

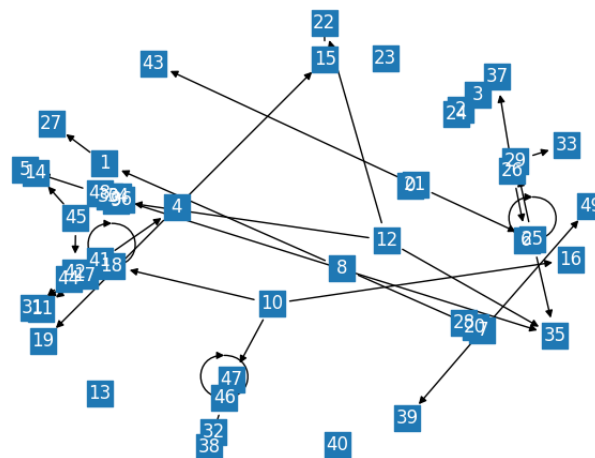


Fig. 1: Sample graph generated

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