Northwestern University

Modeling Predatory Trading in the Stock Market

Jonathan Bohrer

Motivation

Driving Question: How harmful are predatory traders for the general population and for the market itself? Should banks and firms be taking more steps to protect their investors?

Background

Predatory high frequency traders look to take advantage of latency in the market, which is caused by superior technology and closer geographic location to stock exchanges, by gaining information about large trades before they take place. With this information, predatory traders can rush ahead to purchase that stock from the market before the buyer can purchase the stock. Then, the predatory traders can either immediately turn around and sell it to the buyer at a slightly higher price, or wait a few more seconds to maybe drive the price up even more[1].

This results in the predatory traders making almost riskless profit without actually contributing anything to the market, as they will only ever own the stock for a few seconds. While this practice only skims off of the trades, making small profits each time, it still takes money away from ordinary investors, in a way that certainly seems like Wall Street insiders subtly gaming the system[2].

Implementation: Rules

Trader rules followed in a single tick:

- If I have any wealth, I consider buying stock
- Try to complete transaction with trader willing to sell
- If I am the seller, I only sell if I have already made money on the stock or lost at least 10% of value

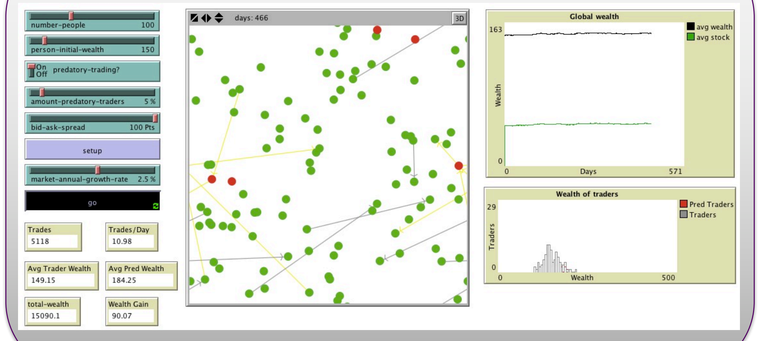
Predatory Trader rules followed in a single tick:

- If the amount of stock being traded is high enough, I will hijack the trade, gaining the spread between the bid and the ask price as profit, and allowing the trade to be completed

System rules:

- Stock appreciation, as well as bid and offer prices are calculated with random-normal values

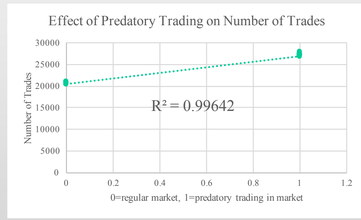
Implementation: Interface

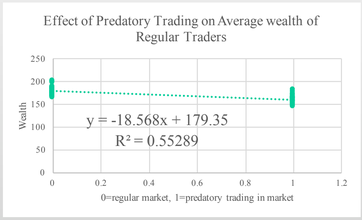


Results/Analysis

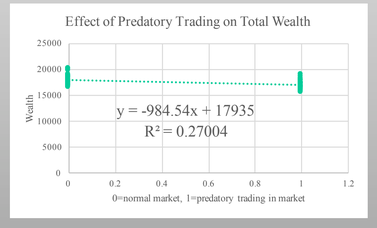
Predatory trading increases liquidity in model, as trades increase 30%.

Data suggests predatory trading decreases the wealth of ordinary traders, with the average wealth down 10%.





Data suggests a weak correlation between predatory trading and total wealth in market, although there is a negative trend.



Conclusion

In conclusion, the model not only shows that predatory trading occurs at the expense of the ordinary investor, but it also shows that predatory trading is harmful to the total wealth of the market, albeit with a weak correlation.

Overall, the results suggest that predatory trading skims off wealth from ordinary investors, many of whom have no idea that this is even happening to them.

References

1. Drum, Kevin. "In Defense of "Flash Boys"" Mother Jones. April 7, 2014.
2. Lewis, Michael. *Flash Boys*. New York: W.W. Norton & Company, 2014.
3. “Volatility S&P 500”. Yahoo! Finance, 2016.
4. Wilensky, U. (1999). NetLogo [computer software]. Evanston, IL: Center for Connected Learning and Computer-Based Modeling, Northwestern University. http://ccl.northwestern.edu/netlogo .

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