Thank you esteemed members of the House Financial Service Committee for inviting me to participate in this hearing. My name is Sal Arnuk, and I co-founded Themis Trading in 2002 with my partner Joe Saluzzi.

At Themis we trade as agents on behalf of large money managers collectively managing trillions of dollars of funds for long-term investors. The experience we have as actual boots-on-the-ground traders is something I hope you may find useful today.

We believe the most damaging elements of what has come to be called the Meme-Stock craze are playing out because of (A) extremely poor investor education and (B) conflicts of interest in the form of order routing inducements, referred to as "payment for order flow" or PFOF, and a lack of accountability for poor investor education and misaligned incentives (Exhibit A).

Investor/Trader Education.

We believe retail brokers have two very important responsibilities: ensuring suitability (which involves investor education), and best execution of their orders.

Robinhood does something very novel; they combine investing/trading tools with a social media experience targeted to young people – complete with trading addiction, and a herding effect. They have amassed a user base whose orders tend to be small; for example, Robinhood's average account size is about $5000, compared with TD Ameritrade's $110,000.

As such, they have created a unique product –small emotion-driven orders that tend to be predictable, which they can then sell to their real customers - HFT market making firms, at a premium. If you think this claim is bombastic, consider that

1) Prior to starting Robinhood the founders developed HFT platforms for "the largest financial institutions in the world."
2) They recently changed their PFOF method from one giving them a set payment per share to one giving them a percentage of the spread instead. Think about this: A Robinhood trader wants the spread in the stocks he/she is trading to be as narrow as possible. The HFT market maker buying those orders benefit most when that spread is as wide as possible. And now Robinhood benefits most when the spread is as wide as possible as well! This is an amazing misalignment of interests.
3) Robinhood turned down market-maker offers of PI for its App users, opting for a larger payment for its own bottom line instead.[1]
4) Robinhood has garnered a $13–$20 billion valuation with its largest revenue source being PFOF, which means that its founders' personal wealth is driven by more customer trading and more PFOF, even if such trading is potentially not in the best interest of its customers.

[1] https://www.sec.gov/litigation/admin/2020/33-10906.pdf

This tells you Robinhood knows full well the value of its herded and gamified product base; they knew to educate their users just enough to incentivize trading and maximize their own revenue as a result of it.   We have included Exhibits B and C as examples of options trading education from Robinhood and TD Ameritrade for you to compare. Draw your own conclusions.

The incentive that has enabled their model is none other than PFOF.

PFOF Presents an Undeniable Conflict of Interest

When investors make a trade, they incur costs both explicit and implicit. PFOF may enable zero commissions, but while that explicit cost is zero, other larger implicit costs dwarf it.

While PFOF is legal, we have long wondered how it possibly could be. How can a broker, charged with the duty of getting its clients the best available prices, possibly do so by selling that client's orders to amazingly sophisticated HFT firms, who in turn will make billions of dollars trading against these orders?

While retail brokers and market making firms, claim that price improvement (PI) accrues to retail investor orders, such price improvement is a flawed calculation:

1) It is based off of a slower price feed (the SIP),
2) It does not take into account odd-lots,
3) And the NBBO reference price it uses is largely set by the very same HFT market makers providing the "PI" in the off-exchange environment.

Regulators know all this. The SEC recently fined Citadel $22 million for mishandling retail orders.[2] They also recently fined Robinhood $65 million failing its best execution responsibilities.[3] They know that the concept of PI is flawed; they approved a huge market structure change which included odd-lots in the SIP, and protected them as a quote.[4] Yet our industry sued the SEC to block this overhaul.[5]

PFOF Increases Overall Costs in the Market – For All Investors, Including Pension Funds

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[2] https://www.sec.gov/litigation/admin/2017/33-10280.pdf

[3] https://www.sec.gov/litigation/admin/2020/33-10906.pdf

[4] https://www.sec.gov/rules/final/2020/34-90610.pdf

[5] https://www.wsj.com/articles/nasdaq-sues-sec-to-block-market-data-overhaul-11612909321

Back in 2012 we wrote a book called Broken Markets[6], in which we asserted that for true price discovery to take place, exchange limit order books need diverse players in them - such as from retail investors/traders, institutional players, index arb players, as well as HFT market makers.

When a few HFT market-makers buy up orders that account for as much as a third of the volume – orders that tend to be less-informed, uncorrelated, and benign, so that they are not represented on exchanges, *what is left on those exchanges is that much more toxic and costly to trade with.* Market impact costs are higher, and spreads are wider as well. Two studies that confirm this are the Babelfish study of transaction costs in "Meme Stocks"[7] and an additional academic study[8], that amazingly points out that when Robinhood experiences technology outages, *spreads in the general market become narrower*. Wider spreads mean that retail investors receive worse prices, even after accounting for PI, and *all other investors see their costs increase as well*.

PFOF Practice Provides a Disincentive for Displayed Limit Orders on Exchanges

These displayed orders are often stepped in front of by HFT market makers who piggy back the price set by them. Those market makers step in and are rewarded with a sale that was only made possible by the displayed order, which narrowed the spread.

Would any of you, when buying a home for example, put a sign out front of said home with the price you would pay, only to help someone else buy the house ahead of you for the same price or a dollar more? Yet that is what happens to displayed orders in the market every day.

PFOF Also Takes the Form of Maker-Taker on Exchanges

This practice creates race conditions to be first in line to get a rebate every time a quote changes in the market place. These race conditions are the goal for the exchanges; after all they sell the tools and speed needed to compete in them. The races are not so good for everyone else as they encourage high costs, games and complexity.

It should surprise no one that investor orders do not dominate these races; HFT Market makers do. Investors' orders typically find themselves further back in the queue. *As a result, investors miss opportunities at buying cheaper stock, and when they do get filled they are subject to outsized adverse selection.* Despite this, brokers representing investors still route largely to these exchanges for that rebate.

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[6] https://www.amazon.com/Broken-Markets-Frequency-Destroying-Confidence/dp/0133993507

[7] https://www.babelfishanalytics.com/news/2021/2/4/meme-stocks-inaccessible-trading-share-trading-cost-and-risk

[8] https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3776874

Regulators know this behavior is conflicted and distorted. In December 2018, the SEC adopted a Transaction Fee Pilot whose purpose was to test the effect of rebates on market quality. Sadly, the exchanges sued, and succeeded in blocking the pilot. What were the exchanges afraid that the pilot would confirm?

Finally, maker-taker on exchanges has dramatically increased fixed trading costs to trade on the exchanges. *This has resulted in less diverse public markets, which is especially undesirable from a price discovery perspective.*

Which of the following markets will have better price discovery?

A) One where the prices are determined by an oligopoly of four large HFT trading firms
B) One where the prices are determined by diverse participants: retail, institutional, arb players, as well as numerous HFT trading firms.

Conclusion

The Meme Stock phenomenon in the markets today results from the dangerous intersection of poor investor education by some brokers, and the PFOF practices that exist on and off stock exchanges. These practices create a massive incentive for such brokers to sell their clients orders to sophisticated trading firms uniquely tooled to profit off of them. This is a needless conflict that can harm retail investors, and it degrades the integrity of the market ecosystem as a whole.

PFOF is a flawed and conflict-ridden practice. Can it be banned? That's for you to look into. However, at a minimum we believe the SEC's Transaction Fee Pilot should be reinstituted, and that it should include all market centers including exchanges, ATSs and non-ATSs. This pilot would be an elegant way to test the effects of these conflicts of interests on market quality as a whole for all investors.

EXHIBIT A

Potential Conflicts from Payment for Order Flow

- In January 2021, a record 47.19% of US stock-market volume traded “off-exchange and on February 9th we hit an all-time record of 50.47%, with retail representing 1/3rd of total US ADV
- The public is realizing that regardless of which retail brokerage firm they use that their orders are going to a select group of wholesalers who have a structural and informational advantage
- Free isn’t “free”: Retail broker PFOF sometimes leads investors to pay hidden implicit costs which are more than what they’d pay in a traditional brokerage commission
- Zero commission trading is a commercial decision by a retail broker and does not absolve a broker of its duty of “best execution” to “obtain a resultant price to a customer that is as favorable as possible under the circumstances”
- PFOF isn’t necessary and is proven by zero commission retail brokers who do not take PFOF
- PFOF hurts execution quality as proven by retail brokers who do not accept PFOF
- If PFOF is banned, Wholesalers can still trade against retail investors on more highly-regulated exchange markets with more market making competition to offer better retail prices
- “The retail investor has never had it better” <> “The retail investor cannot have it any better”
- Wholesalers are also “market makers on NYSE and NASDAQ,” and appear to be adjusting the public market spreads in response to retail, thereby costing all investors more money.
- Wholesalers provide price improvement based on flawed and self-perpetuated measures
- Wholesalers use the press to falsely claim that they can provide retail investors with prices inside the public spread while exchanges can’t, but they often set the spread and its widening.
- Highly regulated exchanges can offer low cost and high-quality alternatives to lightly regulated wholesaler models
- Existing retail-oriented exchange market models may not be working simply because the industry doesn’t want them to work
- Retail brokers claim that wholesalers provide them with extra services, yet these are multi-billion-dollar corporations that choose not to provide the services themselves
- Retail segmentation away from the market increases market fragility and starves natural investor interaction
- Recent enforcement actions demonstrate that retail routing arrangements can be perilous, including front running
- A ban on PFOF should lead to more competition and better prices for retail, not less
- Wholesalers guaranteed execution only means they guarantee an execution, from somewhere
- Citadel is suing the SEC to stop an exchange from enabling market making competitors that could tighten spreads

- Speed of execution is all relative, but what can and does happen in a second can be harmful and imperceptible to a retail investor
- Wholesalers are not a charity and trade against retail when it is profitable for them
- Some retail brokers claim they don't route to where they get paid the most because wholesalers now conveniently pay them the same amount
- Wall Street's self-regulator, FINRA, and its lack of best execution enforcement is becoming an obvious conflict and burden on investors, legislators, state attorney generals, and courts
- A broker can't receive a gift valued at more than $100 per year, but a wholesaler can give that broker $1b to have first crack at profiting against investor orders
- Just because PFOF and exchange rebates are so pervasive doesn't mean it is acceptable. As the Newton v. Merrill Lynch held, "A practice can violate the standard even if it is widespread or universal. There is no safety in going with the herd."

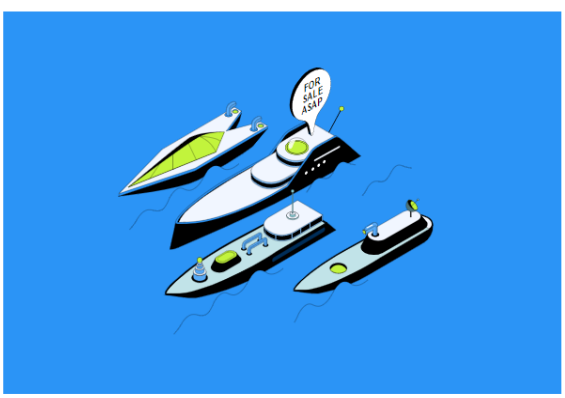
EXHIBIT B

Robinhood Examples

Updated Feb 23, 2021
Robinhood Learn

What is a Stock Option?

Stock options are like growing fruit. You hope the seeds turn into something that can be picked at harvest. If the fruit is inedible, you lose the cost of the seeds. If the fruit is ripe, you have the option to pull the fruit off the tree.



Updated Mar 11, 2021
Robinhood Learn

What is a Call Option?

Call options, are like a grocery store coupon. They give you the right to buy a specific item, for a certain price, before the coupon expires. However, if you find the same item at another grocery store for cheaper, you probably won't use the coupon.

Updated Mar 11, 2021
Robinhood Learn

What is a Put Option?

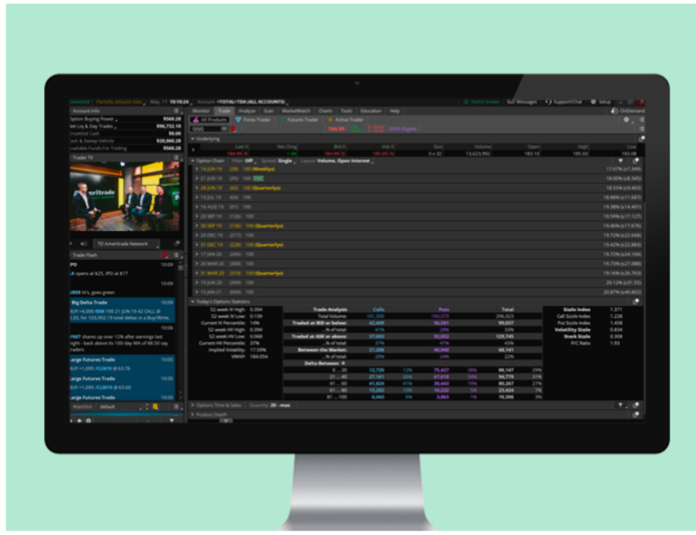
Buying a put option means that you have the right, but are not required, to sell a security at a specified price for a set time.

EXHIBIT C

TD Ameritrade Examples

Options Statistics

Refine your options strategy with our Options Statistics tool. Look at the put-call ratio to identify the potential direction of the underlying security. Assess the IV% to determine a buying or selling strategy. And use our Sizzle Index to help identify if option activity is unusually high or low.



Options Probabilities

Weigh the potential risk of your trade against the potential reward using our Option Probabilities tool built right in the option chain.

Options Trading Basics

You're in tune with the basics of trading, and you're wondering if options may be right for you. Want to learn to trade options? Start here.

Look Before You Leap into Options Contracts: Know Your Contract Specs

- What Does a Market Maker Do, Anyway? It's about Bridging the Gap 3 min read
- Weighing the Probabilities: Options Delta, Options Probability, and Other Risk Analytics 5 min read
- Flexibility and Targeted Exposure: An Intro to Weekly Stock Options 3 min read
- Small Trades: Formula for a Bite-Size Trading Strategy 7 min read
- Do the Math: Calculating Risk and Potential Profit on Vertical Spreads 3 min read