How Payment For Order Flow is impacting markets: The Robinhood and Citadel Case

Introduction

With the rise of High Frequency Trading (HFT), the market structure has evolved into a complex organism. The impact of HFT on markets in terms of altering dynamics, increasing volatility and in general, making markets fickler is indisputable. Whether this is for the better or worse for the rest of the market participants, and especially the retail traders, is a story to be examined. It is this story into which we will delve into deeper, in this article. We will evaluate one of the strategies companies, like Citadel and Virtu use, to increase their returns, possibly at the presumed cost of retail investors. A strategy, that the vast majority of retail traders know nothing about, which nevertheless influences their trading fundamentally. This article will focus on the market practice of Payment for Order Flow (PFOF), in order to explore its context in the rise of retail trading of today. After discussion of the potential conflicts of interest we will examine Robinhood's relationship with Citadel: The most prominent and noteworthy case of this market practice in today's retail trading environment and the problems it brings.

Definition of Payment for Order Flow (PFOF):

By the definition given by the SEC in December 2000, ''Payment for order flow (PFOF) is a method of transferring some of the trading profits from market making to the brokers that route customer orders to specialists for execution."

In other words, a brokerage sells access to its order flow to someone who is very good at executing it. Given the complexity of executing thousands of orders every second effectively, market making HFT firms have taken the role of that ''someone".

PFOF VS Rebate Fee Model:

At this point it is important to make a significant distinction between PFOF and the rebate system/maker-taker fees system which is often considered the same thing, even though it is not. PFOF is market makers(MM) paying for access to order flow whereas a rebate system is an exchange fee that someone is paying for you to rest an order that someone else may choose to interact with. Even though in the rebate model you still have choice as to with who you interact with, In PFOF there is no choice. A common characteristic in both market making models is that the retail broker is bifurcating their ordeflow and that both serve as equivalent monetary flows coming into a broker.

HFT firms pay for the orderflow of brokerages, get the orders before they hit the exchange and engage in market making. It is a market practice which is legal but only if the market spreads they provide are either better or at least match the exchanges. How do they offer more competitive bid-ask spreads while remaining profitable and

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paying for the order flow and what do they get in return from the access to orderflow? The answer to this question lies in the way market makers handle adverse selection risk.

PFOF: Adverse Selection Risk and Bias

A common feature of PFOF is negative/adverse selection bias which is a crucial concept in market making. This is a risk that Market Makers are exposed to because of privately informed traders. Therefore, since these companies have no opinion on market movements and their only task is to facilitate trading, they always take the other side of trades. This increases the risk that market makers fall underwater. Hence, it is in the best interest of MM to trade against noise, uninformed, and liquidity traders because they are less sophisticated in pricing products. This naturally includes most of the retail traders. It is much less probable that market makers make money by taking the other side of a trade from informed ones. Informed traders are almost always institutions like hedge funds or proprietary desks at a buy side firm and are bad for business. This is exactly why the concept of adverse selection risk is so deeply embedded in the PFOF world. Market makers pay for order flow that does not have high adverse selection risk. In other words, they buy access to the orderflow of retail brokerages, like Robinhood, that is coming from retail traders as opposed to informed ones. Hence, this allows High Frequency Trading Market Makers to be able to keep tight bid-ask spreads or, at least, match the exchange spreads. This market maker strategy seems like a win-win situation for both the HFT companies facilitating a market outside the exchange, and profiting from it, and the retail traders who can trade with tighter spreads and lower fees, increasing their profit potential. That is exactly why Citadel is in such a good position to profit from being the market maker for Robinhood.

Main Questions regarding the incentives surrounding PFOF

One of the main complaints of PFOF concerns its structural impact on exchanges. As the neutral orderflow gets sucked away from organized public markets (lit) and sent to private markets, the adverse selection bias in the lit markets gets exacerbated. The result of PFOF is that market makers using the rebate system on exchanges get more often run over due to the concentration of toxic flow (orderflow by informed traders) in exchanges, which leads to the widening out of the lit quote. The increase in rebates over time, increasing the spread with which best execution can fall into, effectively making the argument for PFOF fall apart. Instead of tightening the exchange range and giving the customer the best possible execution, the exact opposite happens. This phenomenon is evident in certain exchanges, like the CME group, where rebates are constantly increasing with some at the max cap of taker fees.

Informational Advantage is another issue that is commonly brought up in PFOF discussions. Market makers that have constant access to flow of orders can gain a very significant and advanced understanding of market dynamics over the market participants. It is obvious, however, that HFT firms that facilitate markets are strictly forbidden from engaging in any kind of trades using that information. It should also be mentioned here that there have not been any instances suggesting that this is something market makers like Citadel and Virtu have engaged in. It, nevertheless, is a weakness of the PFOF model that must be highlighted. This weakness requires constant monitoring and investigation by the regulatory authorities.

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Robinhood

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Robinhood is a financial services platform founded in 2013 by two Stanford University graduates, Baiju Bhatt and Vlad Tenev. Both of them had the vision to "democratizing finance" thereby making it more accessible to younger investors. In order to facilitate this, Robinhood adopted an approach of not charging any commissions on the trades executed on its platform. The app was first showcased at LA Hacks and then officially launched in March 2015.
With its launch Robinhood entered into a tough competition with other retail brokers such as Charles Schwab, Ameritrade and E-trade. Following a boom of clients who signed up on the Robinhood other brokers had to follow suit in cutting their fees, often down to 0$ per trade. So how does Robinhood make money?

Until 2018 Robinhood had a site on its platform "How we make money" in which it clarified to users that its revenues came from interest on money deposited in Robinhood accounts as well as from a paid service called Robinhood Gold. This disclosure has since changed, primarily cause it likely lacks truthfulness. The SEC started an investigation into Robinhood for failing to disclose to investors that it was using a Payment for Order Flow (PFOF) model as described previously. Under SEC and FINRA regulation a broker not only has to clearly disclose to clients that it uses this method to fill orders but also ensure that clients receive best execution of their orders. Both of which Robinhood allegedly failed to do. These two allegations of Robinhood's failure in execution for clients will be examined more closely.

The failure of "Best Execution"

First is the failure to check for best execution. Whenever brokers use the method of PFOF to fill their clients orders they need to ensure that the market maker the order is routed to provides the best execution for the client. Best execution does not automatically mean best price. It could also include a faster filling of the order among other variables. Therefore "best execution" is subjective in nature. Nonetheless it is necessary for brokers to perform certain checks. The investigation by FINRA relates to the time of October 2016 to November 2017. The problem with Robinhood at the time was that the majority of its PFOF was routed through Citadel Securities. Citadel Securities is a market maker whose majority owner is Ken Griffin, the founder of the hedge fund Citadel. Without checking with other market makers or directly the exchange for better execution Robinhood likely received a significant premium on its PFOF from Citadel as it allowed Citadel to profit much more of Robinhood trades than other brokers. Whether true or not it definitively violated FINRA regulation and charges were later settled in December 2019 with a fine for Robinhood of 1.25$ million.

How did Robinhoods story evolve in 2020?

In the first quarter of 2020 the number of retail investors increases drastically. This was fueled by a lack of sports-betting as a way to gamble , additional money through direct stimulus, as well as extensive advertising direct at demographics likely to suffer most from stay at home order. Retail trading increased by more than 200% from the previous year according to Bloomberg. This increased order volumes for all market makers as a graph from Piper Sandler and published by the financial times shows below.

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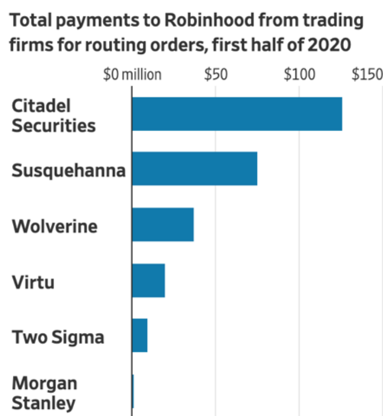
While Citadel Securities is a private firm and does not disclose financials data from Virtu shows a 267% jump in earnings compared to the previous year. Similar numbers can be concluded for Citadel Securities which is responsible for every 40 out of a 100 shares traded in America.

The "Robinhood premium"

On average firms like Citadel Securities pay Robinhood 17 cents per 100 shares. This is 19% above average for other internet brokers such as Charles Schwab or E-trade according to Bloomberg intelligence. In the first quarter of 2020 this even went up to 24cents per 100 shares presenting a 48% premium over the average order flow. This sort of premium is quiet obviously to the detriment of retail investors. However, the reason for this premium is currently still a mystery to many market analysts.



What makes Robinhoods order flow so much more valuable and attractive compared to that of, lets say, E-trade?

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Two reasons could be mentioned. The first could be the one of informed traders, as mentioned previously. Orders from traders who simply know how to value a stock better provide less money to HFT such as Citadel Securities. Since Robinhood is a trading platform aimed primarily at millennials and the average age of users being 26 significant finance experience and pricing methodologies are lacking. Politely these investors are exactly what was defined earlier as noise and liquidity traders, also called "uninformed investors" or more commonly "dumb money". The algorithms of HFT firms like Citadel Securities can chip profits more easily from these kind of order flows than from more professional/Informed investors found on other broker sites. The second reason that could be mentioned in regards to why Robinhood is payed a up to 48% premium on its order flow is the fact that most order coming from the platform are extremely small. Often below 100 shares if at all since the platform allows the buying of partial shares (e.g. half a apple stock for example). The lower the number of shares in an order the less risk there is for market makers to loose money on that order. This decrease in risk as well as a lower spread on smaller orders could explain the premium of the orders from a more market mechanism oriented point of view. It is specifically this failure to disclose to clients that their orders were sold to HFT trading firms that led the SEC to investigate Robinhood in September 2020 and will likely lead to a settlement bigger than 10$ Million although negotiations have not yet begun.

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Conclusion

All in all, while these reasons are speculation and mandatory disclosures only allow for so much analysis, if any at all, it is to some extent evident in the current premium that Citadel Securities pays for Robinhoods order flow that it must gain some type of advantage. Since there is no free lunch in finance this comes at the detriment for retail investors who might not receive the best price. As illustrated in this article PFOF has weaknesses in theory, like informational advantage, and in practice, as seen by the example from Citadel Securities and Robinhood. However, strength and weaknesses exist in any other market making model as well. The idea of scrapping the whole market structure and exploring other models, as supported by some extreme market reformists, may be far-fetched. Nevertheless, improvements, such as strengthening trade through protection, do exist.

TAGS: Robinhood, Citadel, Citadel Securities, Payment for order flow, PFOF, FINRA, SEC, Robinhood investigation, Robinhood Retail Investors, Robinhood fine, Market making,

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