REMEDYING THE NEGATIVE EFFECTS OF EQUITY MARKET ORDER FLOW DECENTRALIZATION ON RETAIL INVESTORS

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I. INTRODUCTION

Fair and efficient financial markets are the centerpiece of most modern free market economies and play a crucial role in the stability, health, and growth of those economies.[1] Until recently, financial markets were accessible only to institutions and high-net-worth individuals, but technological advancements have opened markets to anyone with an internet connection.[2] Though access has increased, numerous regulatory concerns still exist, many of which have not been adequately addressed.

Recently, the concepts of payment for order flow (PFOF) and dark pools have garnered significant media and regulatory attention for how they may

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1 *Please Explain How Financial Markets May Affect Economic Performance*, FED. RSRV. BANK OF S.F. (Jan. 2005), https://www.frbsf.org/education/publications/doctor-econ/2005/january/financial-markets-economic-performance/ [https://perma.cc/X85M-526A].

2 Katie Martin & Robin Wigglesworth, *Rise of the Retail Army: The Amateur Traders Transforming Markets*, FIN. TIMES (Mar. 9, 2021), https://www.ft.com/content/7a91e3ea-b9ec-4611-9a03-a8dd3b8bddb5 [https://perma.cc/H8Z7-FFJQ]; *see also* Kristina Zucchi, *Institutional Traders vs. Retail Traders: What's the Difference?*, INVESTOPEDIA, https://www.investopedia.com/articles/active-trading/030515/what-difference-between-institutional-traders-and-retail-traders.asp [https://perma.cc/FN4F-XSAA] (last updated Aug. 18, 2021) (noting the distinction between retail and institutional investors).

be antagonistic to retail investors.[3] This note argues that retail investors are adversely affected by the increasing decentralization of equity markets caused by PFOF and the overuse of dark pools and argues for regulations to remedy this issue. Section II first explains some foundational topics necessary to understand the proceeding sections: what retail investors are, the process of making a trade, and the concepts of price discovery and liquidity. Next, Section II explains the concepts of PFOF and dark pools, how they operate in financial markets, the entities involved, and the relevant U.S. regulations. Section III details the problems associated with these concepts, how they disadvantage retail investors, how they decentralize public markets, potential solutions to these problems, and the potential effects of these solutions. The recommended solutions seek to deter market decentralization, increase public market liquidity, increase transparency and fairness, and safeguard retail investors and market quality.

II. HISTORY AND BACKGROUND

A. *An Introduction to Retail Investors*

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[3] *See, e.g.*, Jonathan Ponciano, *SEC 'Looking Closely' at 'Dark Pools' – Here's What They Are and Why Reddit Traders Are Rallying*, FORBES (Aug. 4, 2021), https://www.forbes.com/sites/jonathanponciano/2021/08/04/sec-looking-closely-at-dark-pools-heres-what-they-are-and-why-reddit-traders-are-rallying/?sh=5b0a32722e42 [https://perma.cc/V5BG-5HUT]; *SEC Chairman Says Ban of Payment for Order Flow 'On the Table' – Barron's*, REUTERS (Aug. 30, 2021, 5:55 PM), https://www.reuters.com/legal/litigation/sec-chairman-says-ban-payment-order-flow-on-table-barrons-2021-08-30/ [https://perma.cc/93DF-CY8Q]; *see also Virtual Hearing – Game Stopped? Who Wins and Loses when Short Sellers, Social Media, and Retail Investors Collide, Part III before the H. Fin. Serv. Comm.*, 117th Cong. (2021).

As the internet has become more accessible, online trading has increased drastically.[4] Online trading gives younger, lower-income investors easier access to financial markets.[5] The COVID-19 pandemic and the increased presence of finance-focused social media have led to an influx of younger retail investors because of the increased time younger people spend at home and online.[6] There is no universally agreed upon or statutory definition of retail investors; however, retail investors are typically thought of as people, not institutions or algorithms, who buy and sell financial assets for their own account rather than for an institution or for a group of people, and have smaller account sizes than non-retail investors.[7]

Historically, younger, lower-net worth retail investors have had far less access to the financial markets due to high costs, complexity, and other barriers to entry.[8] Retail investor account sizes vary greatly by broker and platform but typically range from thousands of dollars to hundreds of

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[4] Ryan Furhmann, *How the Internet Has Changed Investing*, INVESTOPEDIA, https://www.investopedia.com/financial-edge/0212/how-the-internet-has-changed-investing.aspx [https://perma.cc/FL49-ZWC7] (last updated Oct. 20, 2021).
[5] *Id*.
[6] Daire Ferguson, *How Online Trading Changed in 2020 and What's in Store for 2021*, FINEXTRA (Feb. 17, 2021), https://www.finextra.com/blogposting/19897/how-online-trading-changed-in-2020-and-whats-in-store-for-2021 [https://perma.cc/FL49-ZWC7].
[7] Larry Harris, *Structure of the Investment Industry*, CFA INST. 11, https://www.cfainstitute.org/-/media/documents/support/programs/investment-foundations/13-structure-of-the-investment-industry.ashx [https://perma.cc/46DH-HE9N] (last visited Feb. 14, 2022); Phil Mackintosh, *Who Counts as a Retail Investor?*, NASDAQ (Dec. 17, 2020), https://www.nasdaq.com/articles/who-counts-as-a-retail-investor-2020-12-17 [https://perma.cc/ZRN2-Z2EB].
[8] Mackintosh, *supra* note 7.

thousands of dollars.[9] For example, the average Robinhood account has $3,500, while other brokers like Charles Schwab and TD Ameritrade have average account sizes over ten times that of Robinhood.[10] Retail investors typically buy simple financial assets like stocks, options, and bonds, and rarely trade more complex over-the-counter derivatives.[11] Retail investors make up fifteen to twenty-five percent of equity markets with some being very sophisticated and others being novices.[12] The most common brokerages retail investors use are TD Ameritrade, E*TRADE, Fidelity, and Charles Schwab; however, Robinhood is rapidly gaining market share especially among younger retail investors.[13] Brokers earn money from retail investors

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[9] *See* John McCrank, *Factbox: The U.S. Retail Trading Frenzy in Numbers*, REUTERS (Jan. 29, 2021, 1:57 PM), https://www.reuters.com/article/us-retail-trading-numbers/factbox-the-u-s-retail-trading-frenzy-in-numbers-idUSKBN29Y2PW [https://perma.cc/G7CQ-7R67] (discussing variations in account size by brokerage); *see also Retail Investors Statistics,* MARKETPLACE FAIRNESS (July 15, 2020), https://www.marketplacefairness.org/blog/retail-investors-statistics/ [https://perma.cc/4X5J-7YMX]; *Schwab Report: Year-End 2020 Self-Directed 401(k) Balances up 13% Year-Over-Year Despite Ongoing Volatility and Q1 Market Lows*, BUS. WIRE (Mar. 2, 2021, 9:00 AM), https://www.businesswire.com/news/home/20210302005037/en/Schwab-Report-Year-End-2020-Self-Directed-401-k-Balances-Up-13-Year-Over-Year-Despite-Ongoing-Volatility-and-Q1-Market-Lows [https://perma.cc/JR7E-A9X4]; Lee Barney, *Average Self-Directed Brokerage Account Jumped 8.7% in Q119*, PLANADVISER (May 21, 2019), https://www.planadviser.com/average-self-directed-brokerage-account-jumped-8-7-q119/ [https://perma.cc/93M2-BHJC]; Mackintosh, *supra* note 7; Liz Knueven, *How Much the Typical American Has Invested Outside of Retirement Accounts at Every Age*, BUS. INSIDER (Apr. 3, 2020, 10:05 AM), https://www.businessinsider.com/personal-finance/investments-by-age-americans-non-retirement-2020-3 [https://perma.cc/GS39-L82Z].

[10] Dmytro Spilka, *How Robinhood and its Band of Merry Retail Investors Emerged to Thrive on Wall Street*, NASDAQ (Aug. 12, 2021, 11:59 AM), https://www.nasdaq.com/articles/how-robinhood-and-its-band-of-merry-retail-investors-emerged-to-thrive-on-wall-street-2021 [https://perma.cc/86E6-BURY].

[11] Mackintosh, *supra* note 7.

[12] *Id.*

[13] Sean Ross, *The Biggest Stock Brokerage Firms in the US*, INVESTOPEDIA, https://www.investopedia.com/articles/professionals/110415/biggest-stock-

by charging small commission fees on trades, routing orders to third parties, or widening and profiting from a security's bid-ask spread.[14]

Retail investors are notoriously skeptical and distrusting of financial markets. Over half of retail investors say they believe the stock market is "rigged against them."[15] Much of this lack of trust stems from the complexity and secrecy of financial markets, prominent financial crimes, media narratives calling markets "rigged," and general feelings that institutions and high-net-worth individuals always "win" at the expense of retail investors.[16] The modern practices of PFOF and increased dark pool order execution highlight reasons for this distrust and are discussed below.

B. *The Life of a Trade: From Order to Settlement*

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brokerage-firms-us.asp [https://perma.cc/5YBF-5EA8] (last updated Oct. 24, 2021) (discussing the "big four brokerages"); Nathaniel Popper, *Robinhood Has Lured Young Traders, Sometimes with Devastating Results*, N.Y. TIMES (Sept. 25, 2021), https://www.nytimes.com/2020/07/08/technology/robinhood-risky-trading.html [https://perma.cc/E5KY-TSQY].

[14] Sunil Wahal, *Entry, Exit, Market Makers, and the Bid-Ask Spread*, 10 REV. OF FIN. STUD. 871, 872–73 (1997) (the Bid-ask spread refers to the difference in price between what buyers are willing to pay and what sellers are willing to pay); Barclay Palmer, *What Determines a Stock's Bid-Ask Spread?*, INVESTOPEDIA, https://www.investopedia.com/ask/answers/06/bidaskspread.asp [https://perma.cc/R9K4-JN23] (last updated Jan. 4, 2021).

[15] Sarah O'Brien, *More Than Half of Individual Investors Think the Stock Market Is Rigged Against Them, Survey Finds*, CNBC (Mar. 25, 2021, 11:18 AM), https://www.cnbc.com/2021/03/25/more-than-half-of-retail-investors-say-market-is-rigged-against-them.html [https://perma.cc/GWZ4-72ZW].

[16] *Id.*; Constantine Von Hoffman, *Study: Most Americans Don't Trust the Stock Market*, CBS NEWS (Apr. 21, 2014, 12:37 PM), https://www.cbsnews.com/news/study-most-americans-dont-trust-stock-market/ [https://perma.cc/34ZB-KEPJ]; *OECD Business and Financial Outlook 2019: Strengthening Trust in Business*, OECD (2019), https://www.oecd-ilibrary.org/sites/4d7c9b81-en/index.html?itemId=/content/component/4d7c9b81-en [https://perma.cc/7TG9-TES3]; *see generally Restoring Trust in Financial Markets*, OECD, https://www.oecd.org/daf/fin/financial-markets/18961363.pdf [https://perma.cc/837S-8433] (last visited Feb. 14, 2022).

The stages of a trade are order, routing, execution, clearing, and settlement.[17] The order, routing, and execution processes are highly automated and often instantaneous to the point where most investors are not aware of these processes at all.[18]

1. *Order*

The process of placing a trade is simple: a retail investor clicks the "buy" button on his or her brokerage platform, and the order is sent to the broker for completion.[19] Next, the broker must find a counterparty buyer or seller to take the other side of the trade through the routing and execution processes.[20]

2. *Routing and Execution*

Once the order is placed, it must be routed and executed.[21] Routing is the process of sending an order to another entity/party to be completed (here, the broker acts as the intermediary by connecting a buyer to a seller through the routing process).[22] Execution is the acceptance and completion of the order between the buyer and seller.[23] The broker has many options in routing a trade for execution. The broker may route the trade to a public stock

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[17] *Trade Life Cycle/Securities Trade Life Cycle*, TECHNICALSTACK, https://technicalstack.com/trade-life-cyclesecurities-trade-life-cycle/ [https://perma.cc/PK4F-WE6A] (last visited Feb. 14, 2022); Jim Swartwout, *The Life of a Trade*, ROBINHOOD (Mar. 26, 2021), https://robinhood.engineering/the-life-of-a-trade-c5c5babbe4b5 [https://perma.cc/PK4F-WE6A].
[18] *See, e.g.*, *Schwab's Order Routing Process*, CHARLES SCHWAB, https://www.schwab.com/execution-quality/order-routing-process [https://perma.cc/XW2P-ZQZL] (last visited Feb. 14, 2022).
[19] *Id.*; Swartwout, *supra* note 17.
[20] *Schwab's Order Routing Process*, *supra* note 18.
[21] Swartwout, *supra* note 17.
[22] *Schwab's Order Routing Process*, *supra* note 18.
[23] Swartwout, *supra* note 17.

exchange like the NYSE or NASDAQ to be executed,[24] route the order to an off-exchange third-party market maker for execution,[25] fill the order with the shares in the brokers' own inventory (internalization),[26] fill the order by obtaining shares in an over-the-counter market transaction,[27] or match buyers and sellers through an electronic communication network (ECN).[28] Since each strategy involves different costs, different parties, and different regulations, brokers' use of these strategies vary greatly according to the circumstances of each order.[29] Most trades are executed through orders to public exchanges, but an increasing percentage of retail orders are being routed and executed off-exchange.[30]

3. *Clearing and Settlement*

Finally, the clearing and settlement processes are where the cash is officially transferred and settled between the parties and the assets are officially delivered.[31] Clearing and settlement take several days to complete, require going through several large, quasi-governmental institutions, are

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[24] *Trade Execution*, CORP. FIN. INST., https://corporatefinanceinstitute.com/resources/knowledge/trading-investing/trade-execution/ [https://perma.cc/A8LN-E969] (last visited Feb. 17, 2022); *Understanding Order Execution*, INVESTOPEDIA, https://www.investopedia.com/articles/01/022801.asp [https://perma.cc/7TMF-W5AR] (last updated Jan. 21, 2021).
[25] *Understanding Order Execution*, *supra* note 24.
[26] *Id.*
[27] *Id.*
[28] *Id.*
[29] *Id.*
[30] Gary Gensler, Chairman, Prepared Remarks at the Global Exchange and FinTech Conference, SEC (June 9, 2021), https://www.sec.gov/news/speech/gensler-global-exchange-fintech-2021-06-09 [https://perma.cc/2FKP-47D2].
[31] William C. Spaulding, *Execution, Clearing, and Settlement*, THISMATTER, https://thismatter.com/money/stocks/settlement-and-clearing.htm [https://perma.cc/4RH2-RJKA] (last visited Feb. 14, 2022).

extremely complex, are heavily regulated by the SEC, and operate outside of the knowledge of most retail investors.[32] This note does not focus on clearing and settlement and instead focuses on routing and execution because PFOF and dark pools operate most significantly in these processes.

C. *Liquidity and Price Discovery*

Before discussing PFOF and dark pools, the concepts of liquidity and price discovery must be explained because they are two of the most important features of financial markets and have significant effects on asset prices.[33] Price discovery is the continuous process of determining the value of an asset.[34] This happens as supply and demand forces are expressed through the buying and selling of an asset.[35] As information such as earnings, company news, market conditions, etc. changes, the price of a security adjusts (due to buying and selling pressures) to reflect the market's valuation of the asset

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[32] *Id.*; *see, e.g.*, *Key Points About Regulation SHO*, SEC, https://www.sec.gov/investor/pubs/regsho.htm [https://perma.cc/WGZ9-RRRV] (last visited Feb. 17, 2022) (discussing the clearing and settlement processes in *Rule 204*); DIVISION OF TRADING AND MARKETS OFFICE OF COMPLIANCE INSPECTIONS AND EXAMINATIONS, SEC, STAFF REPORT ON THE REGULATION OF CLEARING AGENCIES (Oct. 1, 2020).

[33] Adam Hayes, *Liquidity*, INVESTOPEDIA, https://www.investopedia.com/terms/l/liquidity.asp [https://perma.cc/64ZT-YUUL] (last updated Aug. 29, 2021); *What Is Price Discovery and How Does it Work?*, IG GROUP, https://www.ig.com/us/trading-strategies/what-is-price-discovery-and-how-does-it-work--190605 [https://perma.cc/943N-QZS8] (last visited Feb. 14, 2022).

[34] *What Is Price Discovery and How Does it Work?, supra* note 33; Simon Constable, *What Is 'Price Discovery' and Why Does it Matter?*, WALL ST. J. (Jan. 8, 2017), https://www.wsj.com/articles/what-is-price-discovery-and-why-does-it-matter-1483930860 [https://perma.cc/J8HF-TDDY]; James Chen, *Price Discovery,* INVESTOPEDIA, https://www.investopedia.com/terms/p/pricediscovery.asp [https://perma.cc/R3CH-28QD] (last updated Dec. 12, 2020).

[35] *What Is Price Discovery and How Does it Work?, supra* note 33; Chen, *supra* note 34.

given the new information at that specific point in time—this is price discovery at work.[36] Effective price discovery is paramount because it ensures that the prices of financial assets are efficiently and accurately reflective of the asset's value given the information available to the market.[37]

Liquidity is the presence and abundance of market participants willing to immediately buy or sell an asset.[38] For example, a house is illiquid compared to a stock because a stock can be bought and sold millions of times in a single day, while it is almost impossible for a single house to be bought or sold more than once in a day. Liquidity constantly fluctuates.[39] A stock might become more liquid before or after its earnings call because more people are buying and selling it.[40] Liquidity also varies between stocks because smaller companies are usually less liquid than much larger, well-known companies.[41] High liquidity is of the utmost importance to financial assets because it typically means that the price discovery process is more efficient and that the spread between the bid and ask price is narrower due to increased order competition.[42]

D. *Order Routing and an Introduction to Payment for Order Flow*

PFOF is an order routing arrangement where, instead of routing an order to an exchange to be executed in the public market (usually by an exchange

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[36] Chen, *supra* note 34.
[37] *Id.*
[38] Hayes, *supra* note 33.
[39] *Id.*; *Liquidity*, BANKRATE, https://www.bankrate.com/glossary/l/liquidity/ [https://perma.cc/4TET-KQUZ] (last visited Feb. 15, 2022).
[40] *Liquidity*, *supra* note 39; Hayes, *supra* note 33.
[41] Hayes, *supra* note 33.
[42] *Id.*

market maker), a broker routes an order to an off-exchange market maker to be executed (in the context of retail investors and PFOF, these are referred to as "wholesalers").[43] The broker profits a very small amount either as a percentage of the bid-ask spread or a fixed price per unit, which is where it makes its revenue in place of commissions (in a PFOF arrangement, the broker gets rebates from the payers for order flow rather than commissions from clients).[44] Wholesaler market makers are the entities that pay for the order flow of retail investors.[45] The vast majority of PFOF arrangements occur with retail brokerages since retail orders are relatively simple and are considered "dumb money," so there is less of an adverse selection risk in taking the other side of their trades.[46]

1. *Entities Involved: Market Makers and Brokers*

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[43] *The Ultimate Guide to Payment for Order Flow*, CENTERPOINT SEC., https://centerpointsecurities.com/payment-for-order-flow-guide/ [https://perma.cc/NSL8-4RNH] (last visited Feb. 15, 2022); *Payment for Order Flow: What It Is and Why It Matters*, NORTHERN TRUST (June 24, 2021), https://www.northerntrust.com/united-states/insights-research/2021/wealth-management/payment-order-flow [https://perma.cc/EQ2M-S2T5]; Annie Massa, *Payment for Order Flow*, BLOOMBERG (Mar. 9, 2017, 4:49PM EST), https://www.bloomberg.com/quicktake/payment-for-order-flow [https://perma.cc/J5FG-4HBN]; *Broker-Dealers and Payment for Order Flow*, CONGRESSIONAL RSCH. SERV. (Apr. 2, 2021), https://crsreports.congress.gov/product/pdf/IF/IF11800 [https://perma.cc/AZ5Y-J3DT] (explaining "wholesalers" and PFOF).

[44] *The Ultimate Guide to Payment for Order Flow*, *supra* note 43; *Payment for Order Flow: What It Is and Why It Matters*, *supra* note 43; Massa, *supra* note 43.

[45] *Market Centers: Buying and Selling Stock*, SEC, https://www.sec.gov/fast-answers/answersmarkethtm.html [https://perma.cc/6E3S-XR95] (last visited Feb. 16, 2022).

[46] John McCrank, *U.S. Online Brokers Still Profiting from 'Dumb Money'*, REUTERS (Oct. 8, 2019), https://www.reuters.com/article/us-usa-brokers-fees/u-s-online-brokers-still-profiting-from-dumb-money-idUSKBN1WN1UD [https://perma.cc/6EEC-XYWY] (explaining that the trades of retail investors are seen as uninformed, so market makers feel particularly comfortable taking the opposite side of their trades).

Market makers and brokers are the two main entities involved in PFOF arrangements. Market makers are liquidity providers—they readily transact on the opposite side of an order as either the buyer or the seller because they own large volumes of the security.[47] Because market makers transact on the buy or sell side, they make small profits from the difference between the bid and ask price (the bid-ask spread).[48] Since market makers make small profits per order, PFOF is advantageous to them because the increased volume of orders being routed to them allows them to profit more (similar to how brokers profited from higher volumes of trades when commission-based models were popular).[49] Market makers are an extremely important part of financial markets because they provide liquidity for markets so there is always someone to buy from or sell to, which narrows spreads and makes price discovery more efficient.[50] Different market makers provide liquidity for different types of market participants: there are market makers for large institutions, public exchanges, retail orders (wholesalers), and many other segments of the market.[51]

The second entity, brokers, are the intermediaries between retail investors and market makers. Previously, online brokers made money by charging commissions to clients for each trade, however, since PFOF has

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[47] *Id.*; Andrew Bloomenthal, *Market Maker*, INVESTOPEDIA, https://www.investopedia.com/terms/m/marketmaker.asp [https://perma.cc/RZ4H-8AFC] (last updated Aug. 31, 2021).
[48] Bloomenthal, *supra* note 47; McCrank, *supra* note 46.
[49] McCrank, *supra* note 46; Bloomenthal, *supra* note 47.
[50] Bloomenthal, *supra* note 47; McCrank, *supra* note 46.
[51] Gensler, *supra* note 30.

been popularized, these brokers no longer have to charge commissions to clients since they make money from the wholesalers who pay them for retail order flow.[52] This commission-free trading model allows investors with very small accounts to trade more frequently and start with very small amounts of money as commissions no longer decrease profits.[53] Robinhood popularized commission-free trading in 2013, which created a new commission-free standard for retail brokers and now represents billions of dollars in broker revenue.[54] This new standard attracted many younger, inexperienced traders who otherwise would not have engaged with financial markets.[55] Though most retail-oriented brokerages utilize PFOF, some still utilize the commission-based model.[56] The controversy surrounding PFOF is that it presents a conflict of interest with a broker's duty of best execution to its client (explained below), may negatively affect execution prices (thus

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[52] *The Ultimate Guide to Payment for Order Flow*, *supra* note 43.

[53] Annie Massa, *The Four Biggest Ways That Robinhood Changed Investing,* BLOOMBERG BUSINESSWEEK (July 29, 2021), https://www.bloomberg.com/news/articles/2021-07-29/robinhood-hood-ipo-four-ways-the-broker-changed-investing [https://perma.cc/VC3N-TRTX]; Theresa W. Carey, *Payment for Order Flow (PFOF)*, INVESTOPEDIA, https://www.investopedia.com/terms/p/paymentoforderflow.asp [https://perma.cc/PX6G-8KKP] (last updated Oct. 20, 2021); *Payment for Order Flow*, CFA INST., https://www.cfainstitute.org/-/media/documents/issue-brief/payment-for-order-flow.ashx [https://perma.cc/X2RW-DLPF] (last visited Feb. 14, 2022).

[54] Bloomenthal, *supra* note 47; *The Ultimate Guide to Payment for Order Flow*, *supra* note 43.

[55] *The Ultimate Guide to Payment for Order Flow*, *supra* note 43; McCrank, *supra* note 9; *Retail Investors Statistics*, *supra* note 9.

[56] *Payment for Order Flow: What It Is and Why It Matters*, *supra* note 43.

offsetting any savings retail investors would have made from zero commissions), and may have an adverse impact on market quality.[57]

2. *Payment for Order Flow Regulations*

Regulations on PFOF are mostly disclosure-based with very few laws being specifically tailored to regulate the practice and process of PFOF itself. All brokers are subject to the client disclosure laws of the Securities Act of 1934, and brokers who use PFOF are subject to additional disclosure requirements under Regulation National Market System (NMS).[58] Under Regulation NMS, brokers must disclose the use of PFOF to clients in account statements, order confirmations, and account creation pages.[59] Regulation NMS also requires brokers in PFOF arrangements to post a quarterly routing report specifying the percentage of total orders routed to other parties, the top ten routing venues, any venue accounting for more than five percent of routing, the amount of payments received (including those from profit sharing relationships), and a description of the broker's relationship and agreement with the payer for order flow.[60]

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[57] *Guidance on the Practice of 'Payment for Order Flow',* FIN. SERV. AUTH. 1–2 (May 2012), https://www.fca.org.uk/publication/finalised-guidance/fg12-13.pdf [https://perma.cc/C7YZ-2U8J] (Noting that "PFOF arrangements create a clear conflict of interest between the clients of the firm and the firm itself. Therefore, it is unlikely to be compatible with our inducements rule and risks compromising compliance with best execution rules.").

[58] 17 C.F.R. § 240.10b–10(a) (2014).

[59] 17 C.F.R. §§ 240.606–.607 (2019).

[60] *Notice to Members 85-32: Payment for Order Flow*, FINRA, https://www.finra.org/rules-guidance/notices/85-32 [https://perma.cc/GB84-N7F9] (last visited Feb. 16, 2022) (reminding member firms of the disclosure requirements in Rule 10b of the Securities Act of 1934); 17 C.F.R. §§ 242.606–.607; *see generally* 17 C.F.R. §§ 242.600–.612.

Best execution laws come from a variety of sources. Under the common law, a client-broker relationship is considered a principal-agent relationship that imposes a duty of best execution on the broker.[61] Brokers are obligated to get their clients the best possible execution price for their trade orders using reasonable diligence.[62] The Financial Industry Regulation Authority (FINRA), a self-regulatory body for large U.S. financial institutions, also regulates the duty of best execution.[63] Under FINRA Rule 5310, firms must "use reasonable diligence to ascertain the best market" for customers and provide them with a price that is "as favorable as possible under prevailing market conditions" or face penalties.[64] This means executing a trade at the National Best Bid and Offer (NBBO) quoted price as required under Regulation NMS.[65] FINRA recently released a clarification on their PFOF rules stating that simply following disclosure rules alone does not constitute following the duty of best execution.[66]

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[61] Kenneth D. Garbade & William L. Silber, *Best Execution in Securities Markets: An Application of Signaling and Agency Theory*, J. OF FIN. 493 (May 1982), https://www.jstor.org/stable/2327354 [https://perma.cc/9PTA-7QQ7].
[62] *Id.*; *FINRA Clarifies Guidance on Best Execution and Payment for Order Flow,* KATTEN (July 28, 2021), https://katten.com/finra-clarifies-guidance-on-best-execution-and-payment-for-order-flow [https://perma.cc/Q5C5-U9H5].
[63] *About FINRA*, FINRA, https://www.finra.org/about [https://perma.cc/Y7JK-JLRF] (last visited Feb. 17, 2022).
[64] *FINRA Clarifies Guidance on Best Execution and Payment for Order Flow*, *supra* note 62.
[65] The National Best Bid and Offer is a quote that shows the best available price for a security. *See* Adam Hayes, *National Best Bid and Offer (NBBO)*, INVESTOPEDIA, https://www.investopedia.com/terms/n/nbbo.asp [https://perma.cc/8GCL-58P7] (last updated June 17, 2021); 17 C.F.R. § 242.600(b) (2021).
[66] *Regulatory Notice 21-23: FINRA Reminds Member Firms of Requirements Concerning Best Execution and Payment for Order Flow*, FINRA, https://www.finra.org/rules-guidance/notices/21-23 [https://perma.cc/D49C-K6QS] (last visited Feb. 15, 2022).

E. *Order Execution and an Introduction to Dark Pools*

The use of dark pools has drastically increased in recent years, and their overuse threatens to increase costs and decrease efficiency in public markets. Stocks may be traded on public exchanges like the NYSE but can also be traded privately on other exchanges.[67] Public exchanges are referred to as "lit exchanges", while non-public exchanges (off-exchange) are referred to as "alternative trading systems" (ATS).[68] Dark pools are a subset of off-exchange ATSs, have been around since the 1980s, and are run and used by large institutions and almost never by retail investors because of their complexity and high barriers to entry.[69] Dark pools hide the identity of the buyer and seller and hide the amount of the security a participant wants to buy or sell, which is why they are referred to as *dark* pools of liquidity.[70] Though PFOF arrangements and dark pools function independently, because

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[67] Yuxin Sun, Gbenga Ibikunle, & Davide Mare, *Light Versus Dark: Commonality in Lit and Dark Liquidity*, EUROPEAN FIN. MGMT ASS'N 2 (Aug. 2017), https://www.efmaefm.org/0efmameetings/efma%20annual%20meetings/2018-Milan/papers/EFMA2018_0262_fullpaper.pdf.

[68] *See generally id.*; Luis A. Aguilar, *Shedding Light on Dark Pools*, SEC (Nov. 18, 2015), https://www.sec.gov/news/statement/shedding-light-on-dark-pools.html [https://perma.cc/M8NT-KR9T].

[69] Elvis Picardo, *An Introduction to Dark Pools*, INVESTOPEDIA, https://www.investopedia.com/articles/markets/050614/introduction-dark-pools.asp [https://perma.cc/R4XP-JHT8] (last updated June 28, 2021).

[70] *Id.;* Aguilar, *supra* note 68; Elvis Picardo, *Pros and Cons of Dark Pools of Liquidity*, INVESTOPEDIA, https://www.investopedia.com/articles/investing/060915/pros-and-cons-dark-pools-liquidity.asp [https://perma.cc/NH8X-UA74] (last updated Apr. 10, 2021); *see also Dark Pool Trading System & Regulation*, CFA INST., https://www.cfainstitute.org/en/advocacy/issues/dark-pools#sort=%40pubbrowsedate%20descending [https://perma.cc/R579-Y9D2] (last visited Feb. 18, 2022); Kaitlyn Kiernan, *Can You Swim in a Dark Pool?*, FINRA (Jan. 27, 2016), https://www.finra.org/investors/insights/can-you-swim-dark-pool [https://perma.cc/3HGP-ELUV].

PFOF routes orders off-exchange, the orders are often executed in dark pools, thus interconnecting these issues.[71]

1. *The Necessity of Dark Pools and Their Propensity to be Misused*

The evidence explained below shows that dark pools, when *not* overused, have increased market liquidity and price discovery because they make the order execution process far more efficient as they provide additional vehicles for execution.[72] Dark pools serve an extremely important purpose to financial institutions.[73] Institutional traders use the anonymity that dark pools provide as a matter of privacy and strategy, allowing them to structure large trades without creating volatile movements in the market, avoid slippage,[74] and benefit from better pricing.[75] Recently, dark pool trading has increased dramatically. Trades executed off-exchange increased from sixteen percent

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[71] *Payment for Order Flow: How Wall Street Costs Main Street Investors Billions of Dollars Through Kickbacks and Preferential Routing of Customer Orders*, BETTER MKTS. 1–2 (Feb. 16, 2021), https://www.bettermarkets.org/sites/default/files/documents/Better_Markets_Payment_for_Order_Flow_Long_02-21-2021.pdf [hereinafter *Payment for Order Flow*].
[72] Haoziang Zhu, *Do Dark Pools Harm Price Discovery?*, MIT SLOAN SCH. OF MGMT. 7, 36 (Dec. 18, 2013), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1712173 [https://perma.cc/6ZCU-WSRH] (explaining that dark pools aid in liquidity and market efficiency using models and empirical data).
[73] *Id.*
[74] Slippage is when a market participant places a large trade order at a certain price but cannot get every share of the order executed at that price due to supply and demand imbalances. *See* Adam Hayes, *Slippage*, INVESTOPEDIA, https://www.investopedia.com/terms/s/slippage.asp [https://perma.cc/7UKB-24Z7] (last updated May 10, 2021). This happens because the participant's order is so large that it fills all of the supply for an asset at the desired price, so the rest of the order must be filled at a higher price where there is more supply, thus, making the order more expensive than desired. *Id.*
[75] Aguilar, *supra* note 68; Picardo, *supra* note 70.

in 2010 to forty percent in 2017.[76] There are currently fifty-nine registered dark pools compared to thirteen registered public stock exchanges.[77] While recognizing the importance and necessity of dark pools in financial markets, this note will focus on the problems associated with dark pools when they are *overused*. Though dark pools are an integral and beneficial part of markets, the overuse of dark pools can decrease and disrupt two primary market functions: liquidity and price discovery, which can have devastating consequences for market quality and retail investors especially.[78]

If overused, dark pools can siphon liquidity from public exchanges because orders that would otherwise be executed on public exchanges are instead executed in dark pools.[79] The overuse of dark pools can widen the bid-ask spread of stocks on public exchanges because the decreased liquidity reduces the total number of competitive bid and ask prices, which makes trading much more expensive for market participants, especially the clients of PFOF arrangements—retail investors.[80] To conceptualize this, think of public markets as buying goods at grocery stores and dark pools as neighbors buying and selling goods to each other. Though both exist simultaneously, if the buying and selling of goods shifts too much to neighbors, grocery stores

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[76] *Dark Pool Trading System & Regulation*, *supra* note 70.
[77] Picardo, *supra* note 69.
[78] Picardo, *supra* note 70; Luis A. Aguilar, *U.S. Equity Market Structure: Making Our Markets Work Better for Investors*, SEC (May 11, 2015), https://www.sec.gov/news/statement/us-equity-market-structure.html#_edn65 [https://perma.cc/G7K7-Y486].
[79] Picardo, *supra* note 69; Picardo, *supra* note 70; Aguilar, *supra* note 78.
[80] Picardo, *supra* note 70; Picardo, *supra* note 69; Robert H. Battalio & Tim Loughran, *Does Payment for Order Flow to Your Broker Help or Hurt You?*, J. BUS. ETHICS 37 (2008), https://www.jstor.org/stable/41219189.

are forced to increase prices since their market share decreases, and because fewer transactions take place at their venue, demand for goods is less clear thus making prices less efficient.[81]

Additionally, the execution of trades in dark pools can distort demand, which creates a severe information asymmetry between retail and institutional traders.[82] This does a disservice to financial markets since retail investors, unlike institutional investors, typically do not have the resources to analyze both lit and dark pool activity making the price discovery process less efficient.[83] Dark pools recently came into the spotlight due to an abnormally large number of retail orders being executed in dark pools during the Reddit-driven "meme stock" short squeezes of early 2021.[84]

2. *Dark Pool Regulations*

The creation of dark pools is subject to a strict regulatory process.[85] However, dark pools are not subject to much oversight after their creation especially regarding the anonymity of participants during trading.[86] Under Regulation ATS, the main regulation concerning dark pools, the ATS must

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[81] Batallio & Loughran, *supra* note 80, at 39; Picardo, *supra* note 70.
[82] Picardo, *supra* note 70; Aguilar, *supra* note 78.
[83] Aguilar, *supra* note 78; Picardo, *supra* note 70.
[84] In January 2021, a large, unorganized group of traders on Reddit simultaneously bought millions of shares and options of low-priced stocks with poor fundamentals ("meme stocks"), such as GameStop and AMC Entertainment, causing the price to increase over 100 times from 2020 lows. Tatum Sornborger, *The Big Short (Squeeze) A Look at the Reddit Rebellion Through a Legal Lens*, FORDHAM J. CORP. & FIN. L. (Feb. 22, 2021), https://news.law.fordham.edu/jcfl/2021/02/22/the-big-short-squeeze-a-look-at-the-reddit-rebellion-through-a-legal-lens/ [https://perma.cc/YTE3-48VS]. This caused a "short squeeze." *Id.* A short squeeze is where institutions who bet against a stock are "squeezed" (forced to exit) out of their short position due to the stock's value appreciating significantly. *Id.*
[85] 17 C.F.R. § 242.301 (2018).
[86] *Id.*

register as a broker-dealer, file an initial operation report that is updated as changes occur, permit and cooperate with examinations of systems and records by regulators, and implement standards to protect anonymity.[87] ATSs that process five percent or more of the average daily volume of a stock for four of the preceding six months must provide prices and sizes of orders for inclusion in quotation data and must establish fair access standards.[88]

Though participants are anonymous during trading, the SEC still has the authority to view dark pool trades, and institutions still must disclose trades after purchase as they would if they bought on public exchanges.[89] Thus, the anonymity in dark pools is not meant to be a cloak that facilitates market manipulation and illegality, instead, the anonymity allows the market participants to be anonymous from other participants for the purpose of more efficiently executing an order and decreasing the market impact of large trades.[90] Dark pool trading records are very accessible to the public, which shows that dark pools only make trades anonymous as they are being ordered and executed, they do not make the record of the trade anonymous.[91] However, as stated above, though dark pools are a very necessary part of markets, their overuse can have very severe consequences, which are discussed in Section III.

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[87] *Id*. at (b)(1)–(10).
[88] *Id.* at (b)(3)–(5).
[89] *Id.* at (b)(1)–(10); Aguilar, *supra* note 68.
[90] Picardo, *supra* note 69; Picardo, *supra* note 70.
[91] George Smaragdis & Nancy Condon, *FINRA Makes Dark Pool Data Available Free to the Investing Public*, FINRA (June 2, 2014), https://www.finra.org/media-center/news-releases/2014/finra-makes-dark-pool-data-available-free-investing-public [https://perma.cc/Q9BB-TDRE].

III. BETTER REGULATING MARKET DECENTRALIZATION TO PROTECT RETAIL INVESTORS

A. *Overview*

This section is composed of four parts detailing PFOF, dark pools, market decentralization, and the broader effects of the solutions presented. The first two parts give an overview of PFOF and dark pools, discuss how each issue is regulated in other countries, analyze statements from prominent financial professionals, present empirical evidence on these issues, and offer increased regulations aimed at bringing liquidity back to public markets. The third part discusses how PFOF and the overuse of dark pools have a decentralizing effect on public markets that harms price discovery and liquidity and offers an alternate solution aimed at directly addressing decentralization rather than PFOF and dark pools individually. The fourth section details the effect the solutions offered could have on retail investors and the broader market.

B. *The Negative Impacts of Payment for Order Flow Arrangements on Markets*

The debate surrounding PFOF centers on whether or not it presents a conflict of interest with the duty of best execution, encourages competition for best execution, gives retail investors price improvement, promotes market efficiency, and would pass costs on to retail investors if it was banned.[92] This

[92] *The Ultimate Guide to Payment for Order Flow*, *supra* note 43; Massa, *supra* note 43; *Broker-Dealers and Payment for Order Flow*, *supra* note 43.

section argues that the SEC should impose a strong regulatory framework on PFOF because the conflict of interest and anti-competitiveness inherent in PFOF are undeniable, and that although the other arguments surrounding the PFOF debate have not been definitively settled, the costs of PFOF far outweigh any purported benefits. This section demonstrates that PFOF deteriorates trade execution quality and public exchange liquidity, encourages overtrading, and is banned in many other developed countries with robust financial markets and regulation systems.[93] In creating a regulatory framework, the SEC should implement one of the following: a complete ban of PFOF, a ban on PFOF as a percentage of the spread only (a partial ban), or a rule requiring that brokers give clients the option to opt-out of PFOF.

1. *The Clear Conflict of Interest in PFOF Arrangements*

Brokers are required to execute their clients' trade orders at the best possible execution price using reasonable diligence.[94] PFOF represents a conflict of interest because a broker may be more inclined to route an order to an entity offering the broker a better rebate but a worse execution price for the client.[95] This conflict of interest has been well documented by prominent finance figures, especially recently.

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[93] *The Ultimate Guide to Payment for Order Flow*, *supra* note 43; *see generally Payment for Order Flow*, *supra* note 71.
[94] *FINRA Clarifies Guidance on Best Execution and Payment for Order Flow*, *supra* note 62.
[95] *Guidance on the Practice of 'Payment for Order Flow'*, *supra* note 57.

In the wake of the early 2021 Reddit meme stock short squeezes,[96] the U.S. House Committee on Financial Services held a three-part hearing called *Game Stopped? Who Wins and Loses When Short Sellers, Social Media, and Retail Investors Collide.*[97] During this hearing, the committee heard from various institutions, experts, and financial market professionals on the issues of PFOF, dark pools, short selling, and retail investors.[98] Though no legislation was drafted or enacted in response to the hearing, it prompted a significant public outcry about PFOF and how it adversely affects retail investors.[99]

Since the hearing, numerous prominent financial professionals have spoken about the conflict of interest and other problems inherent in PFOF. Sal Arnuk, founder of the brokerage firm Themis Trading, testified before the House Committee on Financial Services in the *Game Stopped?* hearing and said:

> While payment for order flow 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

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[96] The short squeezes made national headlines because of their unprecedented size in terms of price appreciation, and because it was one of the first times that retail investors made significant gains at the expense of large institutions. Sornborger, *supra* note 84.

[97] *Virtual Hearing – Game Stopped? Who Wins and Loses When Short Sellers, Social Media, and Retail Investors Collide, Part III Before the H. Fin. Serv. Comm.*, *supra* note 3.

[98] *Id.*

[99] Chris Andrysiak, *Market Impact, Dark Pools, Payment for Order Flow, and You*, SENSIBLE FIN. PLAN. (Feb. 25, 2021), https://www.sensiblefinancial.com/market-impact-dark-pools-payment-for-order-flow-and-you/ [https://perma.cc/WE34-UKWB].

> orders to amazingly sophisticated high-frequency trading firms, who in turn will make billions of dollars trading against these orders?[100]

Arnuk also noted that "Robinhood benefits most when the spread is as wide as possible."[101] A wide spread means that there is a significant difference between the bid price and the ask price of a security, which makes the security significantly more expensive for retail investors to buy and sell but more profitable for brokers and market makers.[102] Since the *Game Stopped?* hearing, SEC chairman Gary Gensler has repeatedly commented on the problems of PFOF.[103] Gensler recently said that an outright ban of PFOF is "on the table"[104] due to the conflict of interest.

Additionally, in 2004, Citadel Securities LLC, which is currently one of the largest payers for the order flow of retail investors, commented on an SEC PFOF regulation proposal saying, "the practice of payment for order flow creates serious conflicts of interest and should be banned"[105] and called the practice anti-competitive and bad for price discovery.[106] Ken Griffin, the founder of the company, recently said that he would be "quite fine" if the practice was banned as he considers it a significant cost despite his firm being

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[100] Shanny Basar, *Payment for Order Flow Is 'Undeniable Conflict of Interest'*, TRADERS MAG. (Mar. 18, 2021), https://www.tradersmagazine.com/xtra/payment-for-order-flow-is-undeniable-conflict-of-interest/ [https://perma.cc/9U83-VWEF].
[101] *Id.*
[102] Palmer, *supra* note 14.
[103] Thomas Franck, *SEC Chief Gensler Says Regulator Assessing Future of Payment for Order Flow*, CNBC (Oct. 19, 2021), https://www.cnbc.com/2021/10/19/sec-chief-gensler-says-regulator-assessing-payment-for-order-flow.html [https://perma.cc/L8UY-4HZJ].
[104] *SEC Chairman Says Ban of Payment for Order Flow 'On the Table' – Barron's*, *supra* note 3.
[105] Competitive Developments in the Options Markets, Exchange Act Release No. 34-49175, File No. S7-07-04 (Apr. 13, 2004).
[106] *Id.*

one of the largest payers for order flow.[107] The statements of these prominent financial professionals and the statements of many others on the problems of PFOF show that a clear conflict of interest exists with a broker's duty of best execution.[108]

The argument that brokers do not act on this conflict of interest is demonstrably false when analyzing fines brought against the institutions involved in the PFOF process. Citadel Securities, Virtu Financial, and other major PFOF players have been fined millions of dollars by regulators for mishandling retail investor orders in recent years.[109] Robinhood has been

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[107] Madison Darbyshire, *Citadel Securities Founder 'Quite Fine' with Ending Payment for Order Flow*, FIN. TIMES (Oct. 4, 2021), https://www.ft.com/content/3c9b5189-0b0e-4b83-a2e7-533f3ac85733 [https://perma.cc/79UE-R784].

[108] Matthew Fox, *Legendary VC Investor Bill Gurley Wants to Ban the Order Flow Practice at the Heart of the Robinhood Saga – And One Platform Is Already Abandoning It*, BUS. INSIDER (Feb. 1, 2021, 11:10 AM), https://markets.businessinsider.com/news/stocks/payment-for-order-flow-robinhood-bill-gurley-trading-app-public-2021-2 [https://perma.cc/VWY3-AVKP]; Press Release, *Reps. Foster, Axne Press Robinhood for Increased Transparency to Prevent Conflicts of Interest*, CONGRESSMAN BILL FOSTER (Mar. 3, 2021), https://foster.house.gov/media/press-releases/reps-foster-axne-press-robinhood-for-increased-transparency-to-prevent [https://perma.cc/B2E2-HNDF] (discussing the lack of transparency and conflicts of interest inherent in PFOF); Huw Jones, *French Watchdog Chief Calls for Ban on 'Payment for Order Flow' in EU Stock Market*, REUTERS (Oct. 7, 2021, 4:36 PM), https://www.reuters.com/world/europe/french-watchdog-chief-calls-ban-payment-order-flow-eu-stock-market-2021-10-07/ [https://perma.cc/82EM-M7ZN] (discussing French securities regulator, Robert Ophele, saying that he is "strongly inclined to favour the clarity of a ban for payment for order flow").

[109] *Citadel Securities Paying $22 Million for Misleading Clients About Pricing Trades*, SEC (Jan. 13, 2017), https://www.sec.gov/news/pressrelease/2017-11.html [https://perma.cc/PLC6-NEV4]; *see generally, 2016 Year in Review: Select SEC and FINRA Developments and Enforcement Cases,* MORGAN LEWIS (2016), https://www.morganlewis.com/~/media/files/publication/morgan%20lewis%20title/white%20paper/2017/lpg_2016-year-in-review_feb2017.ashx?la=en [https://perma.cc/ZZT7-HSQZ] (documenting many of the fines levied to financial institutions for mishandling customer orders); *e.g.*, *Financial Industry Regulatory Authority Letter of Acceptance, Waiver and Consent No. 2016049752801*, FINRA,

fined several times by regulators totaling over seventy million dollars, including the largest-ever fine by FINRA, for violations of PFOF and best execution practices.[110] Most notably, in the SEC's 2020 action against Robinhood's PFOF practices, the SEC noted that Robinhood made a "Best Execution Committee" to monitor trade execution quality and "observed that Robinhood was not obtaining much price improvement on its customer orders in equity securities" yet took no action to address the issue for over three years.[111] The SEC noted that "Robinhood explicitly offered to accept

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https://www.finra.org/sites/default/files/fda_documents/2016049752801%20Virtu%20Americas%20LLC%20%28f%20k%20a%20KCG%20Americas%20LLC%29%20CRD%20149823%20AWC%20jlg.pdf (documenting a $175,000 fine to Virtu Financial for best execution violations); *e.g.*, *Financial Industry Regulatory Authority Letter of Acceptance, Waiver and Consent No. 2415045441001*, FINRA (Feb. 4, 2020), https://www.finra.org/sites/default/files/fda_documents/2015045441001%20Virtu%20Americas%20LLC%20%28fka%20KCG%20Americas%20LLC%29%20CRD%20149823%20AWC%20va.pdf (documenting a $250,000 fine against Virtu Financial for failure to report and mishandling orders); *e.g.*, *Financial Industry Regulatory Authority Letter of Acceptance, Waiver and Consent No.2014041859401*, FINRA (July 16, 2020), https://www.finra.org/sites/default/files/fda_documents/2014041859401%20Citadel%20Securities%20LLC%20CRD%20116797%20AWC%20sl.pdf (documenting a $700,000 fine against Citadel Securities for misusing and trading ahead of customer orders).

[110] *See Financial Industry Regulatory Authority Letter of Acceptance, Waiver and Consent No. 2020066971201,* FINRA (June 30, 2021), https://www.finra.org/sites/default/files/2021-06/robinhood-financial-awc-063021.pdf (documenting a $70 million action against Robinhood for misleading customers and mishandling customer orders); *see also FINRA Fines Robinhood Financial, LLC $ 1.25 Million for Best Execution Violations*, FINRA (Dec. 19, 2019), https://www.finra.org/media-center/newsreleases/2019/finra-fines-robinhood-financial-llc-125-million-best-execution [https://perma.cc/UZ4F-TYUP]; *see also FINRA Orders Record Financial Penalties Against Robinhood Financial LLC,* FINRA (June 30, 2021), https://www.finra.org/media-center/newsreleases/2021/finra-orders-record-financial-penalties-against-robinhood-financial [https://perma.cc/AA27-BS4C].

[111] *In re* Robinhood Financial, LLC, Securities Act Release No. 1906, Exchange Act Release No. 90694, (SEC Dec. 17, 2020), https://www.sec.gov/litigation/admin/2020/33-10906.pdf.

less price improvement for its customers"[112] in its PFOF arrangements. These fines and statements discredit the argument that brokers do not act on the conflict of interest, show that PFOF can lead to worse execution prices, and show that the current PFOF regulations are ineffective as fines have become a cost of business.

2. *Lack of Price Improvement, Worse Execution Prices, and Over-Trading*

Though the conflict of interests of PFOF have been well-documented, proponents of the practice dismiss these arguments by claiming that PFOF leads to better prices for retail investors, thus outweighing any conflicts of interest.[113] There is research on both sides as to whether PFOF improves or worsens execution prices, however, when considering the decentralizing effect PFOF has on markets, the broader costs outweigh the debated benefits.[114] Proponents of PFOF argue that the practice increases competition for retail orders among market makers (thus improving prices), PFOF

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[112] *Id.* at 6.

[113] Nir Kaissar, *Banning Payment for Order Flow Would Be a Huge Mistake*, BLOOMBERG (Oct. 9, 2021, 8:30 AM), https://www.bloomberg.com/opinion/articles/2021-09-13/personal-finance-banning-payment-for-order-flow-would-be-a-mistake [https://perma.cc/ZR7A-UUPV]; Natasha Dailey, *Ending Payment for Order Flow Would Be a 'Disservice' to Retail Traders, Says Former TD Ameritrade Chief*, BUS. INSIDER (Nov. 10, 2021, 4:27 PM), https://markets.businessinsider.com/news/stocks/payment-for-order-flow-robinhood-retail-traders-td-ameritrade-chief-2021-11 [https://perma.cc/UT7T-ZEEQ] (arguing that banning PFOF would increase costs for retail investors); Hal Scott, *Why US Regulators Should Allow Payment for Order Flow to Continue,* FIN. TIMES (Sept. 20, 2021), https://www.ft.com/content/983bc6c2-7894-4f25-b040-c03832808b1a [https://perma.cc/8VXB-MVVB] (arguing that conflicts of interest are not acted on and that the net cost savings outweigh and potential conflicts).

[114] Kaissar, *supra* note 113; *The Ultimate Guide to Payment for Order Flow*, *supra* note 43.

increases liquidity and makes price discovery more efficient, and PFOF allows brokers not to charge commissions, which leads to net positive improvements on prices for retail investors in trade execution.[115] However, when analyzing empirical data, SEC actions, and market structure, the validity of these arguments comes into question.

According to SEC Chairman Gensler, public exchange market makers "must compete with each other on an order-by-order basis to offer the best price," which is extremely competitive and leads to better execution prices.[116] On the other hand, off-exchange wholesalers compete with very few entities and only have to measure their price improvement against the NBBO, "which is a much less competitive benchmark," in setting their execution price, whereas exchange market makers have to compete with each other by often offering better prices than the NBBO.[117] Thus, because wholesalers can make more profits from this less competitive execution benchmark, they can offer brokerages higher rebates to persuade them to route the order to the wholesaler and have it executed for a worse price than it would have been executed on a public exchange.[118] In addition to creating worse execution prices for retail investors, when more orders are routed off-exchange, public exchange bid and ask prices become less competitive due to decreased

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[115] *The Ultimate Guide to Payment for Order Flow*, *supra* note 43; Kaissar, *supra* note 113; Dailey, *supra* note 113.
[116] Gensler, *supra* note 30.
[117] *Id.*
[118] *Id.*

liquidity and execution competition.[119] The anti-competitiveness inherent in PFOF arrangements is evident by the fact that there are only seven major wholesalers in the PFOF sector of the market despite the fact that it comprises over thirty-eight percent of trading activity (presenting a potential "too big to fail" problem as well).[120]

Studies have yielded mixed results as to whether PFOF offers any price improvement. The CFA Institute of the U.K. reviewed retail trades two years before and two years after U.K. regulators banned PFOF and found that retail trades executed at best quoted prices increased from sixty-five percent to ninety percent after the ban.[121] The authors attribute PFOF's anti-competitiveness and siphoning of liquidity from public markets as the reasons for the significant change.[122] On the other hand, a recent U.S. study that modeled retail trades routed off-exchange against exchange-executed trades found that off-exchange executions, including those with PFOF arrangements, lead to tighter spreads than public exchanges.[123] This discrepancy is likely due to the differences in U.S. and U.K. market structure.

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119 *Id.*; Gary Gensler, *Prepared Remarks at London City Week*, SEC (June 23, 2021), https://www.sec.gov/news/speech/gensler-speech-london-city-week-062321 [https://perma.cc/M477-GHPR].
120 Gensler, *supra* note 119; Gensler, *supra* note 30; *see generally Payment for Order Flow*, *supra* note 71.
121 Sviatosloav Rosov, *Payment for Order Flow in the United Kingdom*, CFA INST. 1 (Jun. 23, 2016), https://www.cfainstitute.org/en/advocacy/policy-positions/payment-for-order-flow-in-the-united-kingdom [https://perma.cc/3SNZ-EU8W].
122 *Id.*
123 Samuel Adams, Connor Kasten, & Eric K. Kelly, *Do Investors Save when Market Makers Pay? Retail Execution Costs Under Payment for Order Flow Models*, UNIV. OF TENN., KNOXVILLE (Dec. 1, 2021), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3975667 [https://perma.cc/BD5E-PNNU].

As previously discussed, unlike U.K. markets, U.S. off-exchange wholesalers benchmark price improvement to the NBBO, which they also degrade by siphoning liquidity from public markets, thus allowing wholesalers to claim price improvement even though exchange prices are likely better (explained further in Section IV).[124] Thus, PFOF's siphoning of liquidity to off-exchange venues decentralizes markets and likely increases costs for retail investors.[125]

Additionally, retail investors are increasingly becoming the victims of over-trading due to gamification in investing apps and free trades made possible by PFOF. In a recent report examining the Reddit short squeezes of 2021, the SEC found that "payment for order flow and the incentives it creates may cause broker-dealers to find novel ways to increase customer trading."[126] This over-trading is not in the best interest of retail investors since it usually leads to worse returns, but it is in the interest of brokerages and wholesalers since they profit from the volume of client trades, not the returns of client trades.[127] Finally, FINRA and the SEC's current framework

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[124] Battalio & Loughran, *supra* note 80, at 39; *Payment for Order Flow*, *supra* note 71, at 8–9.

[125] *Payment for Order Flow*, *supra* note 71, at 8–9.

[126] *Staff Report on Equity and Options Market Structure Conditions in Early 2021*, SEC 44 (Oct. 14, 2021), https://www.sec.gov/files/staff-report-equity-options-market-struction-conditions-early-2021.pdf.

[127] James Fallows Tierney, *Gamification in Securities Regulation*, 72 DUKE L.J. 5, 31 (forthcoming 2022–2023), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3916407 [https://perma.cc/JH3N-VNME]; *see also* Brad M. Barber, Xing Huang, Terrance Odean, & Chistopher Schwarz, *Attention Induced Trading and Returns: Evidence from Robinhood Users*, J. OF FIN. 19– 20 (Oct. 12, 2021), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3715077 [https://perma.cc/6LNV-W85A] (explaining that retail investors consistently perform worse when over-trading occurs).

of PFOF, or lack thereof, is extremely difficult to police because of the large volume of orders traded daily, the lack of enforcement mechanisms in place to catch best execution violators, and the presence of high-frequency trading algorithms capable of executing millions of trades per second.[128] Thus, the debated price improvement of PFOF is far outweighed by its cost to market structure, market quality, and retail investors.

3. *PFOF Regulations in Other Countries*

Many countries with robust financial markets and regulatory frameworks have banned the practice of PFOF for many of the reasons outlined above.[129] In 2012, the Financial Services Authority of the U.K. (now the *Financial Conduct Authority*) banned PFOF due to its anti-competitiveness and the conflict of interest it presented with the U.K.'s best execution laws (which are similar to those of the U.S.).[130] In 2017, The Australian Securities & Investments Commission (ASIC) prohibited order incentives, which are substantially similar to PFOF, between market participants in Part 5.4B of the ASIC Market Integrity Rules.[131] Australia is currently considering even stricter regulations on PFOF as the current regulations have a loophole for

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[128] *Payment for Order Flow*, *supra* note 71, at 4–5, 7–8 (explaining how the speed and volume of high frequency trading algorithms in PFOF arrangements is detrimental to retail investors).
[129] Mark Kolakowski, *SEC Considers Banning Payment for Order Flow,* INVESTOPEDIA, https://www.investopedia.com/sec-considers-banning-payment-for-order-flow-5199447 [https://perma.cc/F2PN-GUUN] (last updated Oct. 22, 2021).
[130] *Guidance on the Practice of 'Payment for Order Flow'*, *supra* note 57.
[131] *ASIC Market Integrity Rules (Securities Markets),* AUSTRALIAN SEC. & INV. COMM'N 96–97 (2017), https://www.legislation.gov.au/Details/F2018C00334/Html/Text#_Toc513191226 [https://perma.cc/8LL5-N2ND].

non-market participants.[132] PFOF has been banned by the EU under regulation Markets in Financial Instruments Directive II (MiFID II) and by Indian and Dutch authorities as well.[133] Finally, though Japan, Singapore, and Hong Kong allow PFOF, they have much stricter regulations than the U.S. as they have created control structures to specifically address conflicts of interest in PFOF (to the point where PFOF, though legal, is "non-viable" in Hong Kong).[134] The bans on PFOF in these countries are based on the same set of concerns: conflicts of interest with brokers' duty of best execution, a lack of price improvement, and market decentralization, thus showing that the U.S. must go beyond its simplistic, disclosure-based regime of policing this practice.[135]

4. *Regulating PFOF: A Complete Ban, a Partial Ban, or Client Choice*

Because of the problems inherent in PFOF outlined above, the SEC must create a regulatory framework to protect retail investors and market quality. The SEC should either completely ban PFOF as a practice, ban PFOF as a

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[132] *21-224MR ASIC Consults on Payment for Order Flow Rule Amendments,* AUSTRALIAN SEC. & INV. COMM'N (Aug. 25, 2021), https://asic.gov.au/about-asic/news-centre/find-a-media-release/2021-releases/21-224mr-asic-consults-on-payment-for-order-flow-rule-amendments/ [https://perma.cc/U4MG-ER4A].
[133] INT'L ORG. OF SEC. COMM'N, CR07/2016, REPORT ON ORDER ROUTING INCENTIVES (Dec. 2016), https://www.iosco.org/library/pubdocs/pdf/IOSCOPD551.pdf.
[134] *Id.*; *A Consultation Paper on the Regulation of On-Line Trading of Securities and Futures*, SEC. & FUTURES COMM'N 13 (Dec. 2000), https://apps.sfc.hk/edistributionWeb/api/consultation/openFile?lang=EN&refNo=00CP6.
[135] Australian Sec. & Investments Comm'n, *supra* note 132; *Guidance on the Practice of 'Payment for Order Flow'*, *supra* note 57.

percentage of the spread only, or require brokers to give clients the option to opt-out of PFOF.[136] An outright ban of PFOF is preferable because lesser regulations would not completely solve the problems. If the SEC intends to keep PFOF, it should, at the very least, ban PFOF as a percentage of the spread (a partial ban) since this presents the most blatant conflict of interest. As stated by Sal Arnuk above, PFOF as a percentage of the spread means that brokers profit more when spreads are wider and trades are executed at worse prices.[137] Instead, if the SEC is intent on keeping PFOF, it should only allow PFOF where brokers receive payments per trade, not as a percentage of the spread. Though this would not solve the conflict of interest, it would remedy the most substantial conflict of interest.

Finally, if the SEC refuses to ban PFOF in any respect, it should still adopt stricter regulations to protect retail investors. First, the SEC should require brokers to allow clients to opt-out of PFOF (similar to other financial laws giving clients the right to opt-out of information sharing practices).[138] Though this would not solve the problem, it may be seen by retail investors as a sign of transparency in what would hopefully be a step in the direction

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[136] Divya Seth, *Payment-for-Order-Flow Implications for Robinhood Users*, UNIV. OF WASH. 4 (Mar. 13, 2020), https://papers.ssrn.com/sol3/papers.cfm?abstractid=3779648 [https://perma.cc/73RK-VSQP].

[137] Basar, *supra* note 100.

[138] Seth, *supra* note 136; Julia Kagan, *Opt Out Right*, INVESTOPEDIA, https://www.investopedia.com/terms/o/opt-out-right.asp [https://perma.cc/4KNZ-N83K] (last updated Feb. 13, 2021) (discussing consumer protection opt-out laws where, in certain cases, consumers have the right to opt-out of their financial information/data being shared by their financial institution).

of alleviating retail investors' views that markets are rigged.[139] However, this solution may not be effective since most retail investors do not understand PFOF and would probably not want to pay commissions if given the option.[140] Second, the SEC could implement a "strike" system where brokers and wholesalers who repeatedly violate best execution laws are restricted or banned from participating in PFOF as they accumulate a certain number of strikes over a given period of time. This measure would better encourage adherence to best execution laws as the fines levied against institutions are not effective.[141]

Overall, PFOF's conflicts of interest, its lack of price improvement, and regulations in other countries show that the SEC cannot take the path of inaction, it must create a regulatory framework.[142] Though an outright ban of PFOF is preferable, the SEC has several regulatory options that it can implement to begin remedying this issue. Continuing to allow this practice will continue to disadvantage retail investors, deteriorate price quality for market participants, and erode trust and transparency in financial markets.

C. *The Overuse of Dark Pools and Demand Distortion*

As previously discussed, dark pools are a very beneficial, necessary part of financial markets but can be very detrimental when overused. Dark pools are used by institutions when executing large trades to avoid drastically

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[139] O'Brien, *supra* note 15.
[140] Seth, *supra* note 136; Scott, *supra* note 113.
[141] *See generally 2016 a Year in Review: Select SEC and FINRA Developments and Enforcement Cases*, *supra* note 109.
[142] Seth, *supra* note 136.

moving the market (decreasing market impact), to avoid slippage, and for anonymity purposes.[143] There is strong evidence that the use of dark pools has increased market efficiency and liquidity by providing more avenues for execution thus allowing large orders to not drastically increase market volatility.[144] However, because of their lack of transparency and potentially distortive effects on lit market price discovery, dark pools have the potential to be misused, and there is strong evidence that they are being misused in practice.[145] This section discusses how the overuse of dark pools disadvantages retail investors and is detrimental to the broader market by analyzing empirical studies, statements from financial regulators, and regulations in other countries. Finally, solutions that incentivize more trading on lit exchanges rather than dark pools and penalties for overusing dark pools are presented.

1. *When Dark Pool Use Becomes a Problem*

Dark pools and retail investors are not normally discussed in the same sentence because of the opaqueness and complexity of dark pools.[146] This changed recently when institutions routed and executed over 50% of heavily

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[143] Rhodri Preece & Sviatoslav Rosov, *Dark Trading and Equity Market Quality*, FIN. ANALYSTS J. 33, 34 (Nov./Dec. 2014), https://www.jstor.org/stable/24586289 [https://perma.cc/BUB9-WEBC].
[144] *Id.*
[145] *See, e.*g. Emily Chasan, *Dark Pools May Obscure Market Prices*, REUTERS (Apr. 21, 2008, 8:18 AM), https://www.reuters.com/article/us-darkpools-markets/dark-pools-may-obscure-market-prices-idUSN0748076220080421 [https://perma.cc/2VJW-U89P]; Aguilar, *supra* note 68.
[146] *See generally* Nathaniel Popper, *As Market Heats Up, Trading Slips into Shadows*, N.Y. TIMES (Apr. 1, 2013), https://www.nytimes.com/2013/04/01/business/as-market-heats-up-trading-slips-into-shadows.html [https://perma.cc/DDQ6-WEMJ].

retail-traded meme stocks in dark pools during high volume, high price appreciation trading sessions.[147] This instance highlights the problems of the overuse of dark pools in financial markets. One of the original purposes of dark pools was to allow large trades to be executed without drastically moving the market and to avoid slippage.[148] However, because dark pools do not show the quantity and bid-ask prices of an order and do not occur on lit exchanges, when trades are executed in dark pools rather than public exchanges, the price displayed on the public exchange does not reflect demand from dark pools.[149] In other words, when retail investors see the prices displayed on public exchanges, those prices may not reflect true supply and demand interactions because sometimes more than forty percent of trading happens off-exchange, which is not reflected in exchange prices.[150] This poses a disadvantage to retail investors because it means they are making investment decisions without a large portion of the relevant price data.[151]

Off-exchange trading is not a problem when it constitutes a non-excessive percentage of trades, in fact, essentially all stocks have at least

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[147] Tyler Bundy, *What Are They Hiding? Institutions Are Trading a Ton of AMC Entertainment Stock on the Dark Pool*, BENZINGA (Sept. 20, 2021, 5:16 PM), https://www.benzinga.com/trading-ideas/long-ideas/21/09/23019781/what-are-they-hiding-institutions-are-trading-a-ton-of-amc-entertainment-stock-on-the-da [https://perma.cc/B2TA-QQ5C]; *see generally* Sornborger, *supra* note 84.
[148] Aguilar, *supra* note 68; Picardo, *supra* note 69.
[149] Chasan, *supra* note 145; Aguilar, *supra* note 78.
[150] Aguilar, *supra* note 78; Bundy, *supra* note 147.
[151] Aguilar, *supra* note 78.

some of their daily volume executed in dark pools;[152] however, when more than forty percent of all orders are executed in dark pools, it can distort demand and price discovery.[153] This becomes the most disadvantageous for retail investors with meme stocks because they are heavily traded by retail investors but heavily executed in dark pools thus creating an information asymmetry that disproportionately affects retail investors.[154] Indeed, the average order size of dark pools has drastically decreased in recent years to around 200 shares, which is comparable to public exchange averages, thus showing that dark pools have strayed away from their intended purpose of facilitating large institutional trades.[155]

Additionally, because dark pools inherently decentralize markets by taking liquidity away from public exchanges, their overuse has the potential to cause price inefficiencies as economist Daniel Weaver says "if long-term investors are being siphoned off and sent away from the exchanges, there will

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[152] Dan Kessous, *The Risk and Reward of More Dark Pool Trading*, NASDAQ (Dec. 1, 2021, 9:20 AM), https://www.nasdaq.com/articles/the-risk-and-reward-of-more-dark-pool-trading [https://perma.cc/QH6P-2CPC]; Aguilar, *supra* note 68.
[153] Rhodri Preece, *Dark Pools, Internalization, and Equity Market Quality*, CFA INST. 58 (2012), https://www.cfainstitute.org/-/media/documents/article/position-paper/dark-pools-internalization-equity-market-quality.ashx [https://perma.cc/7FQX-3667] (finding that 46.7% of trades being executed in dark pools may be the tipping point for price deterioration).
[154] John Mccrank, *'Meme' Stock Prices May not Properly Reflect Demand -NYSE President*, REUTERS (June 17, 2021, 3:10 PM), https://www.reuters.com/business/meme-stock-prices-may-not-properly-reflect-demand-nyse-president-2021-06-16/ [https://perma.cc/FU9H-YKBK]; *see generally* Sornborger, *supra* note 84.
[155] John McCrank, *Dark Markets May Be More Harmful Than High-Frequency Trading*, REUTERS (Apr. 7, 2014, 12:49 AM), https://www.reuters.com/article/us-markets-darkpools-analysis/dark-markets-may-be-more-harmful-than-high-frequency-trading-idUSBREA3605M20140407 [https://perma.cc/P92T-5ZRW]; Picardo, *supra* note 69.

be less competition and prices will get worse."[156] Prices will get worse because there will be less competition for better bids and asks, so the spread will widen, which increases the costs for every market participant.[157] Weaver conducted an extensive literature review and study on how dark pools affect quoted, effective, and realized spreads and found that when overused as an internalization method, dark pools generally lead to wider spreads and have a negative impact on market quality.[158] Weaver noted higher levels of volatility, worse spreads, and less efficient price discovery when dark pool internalization is high due to inefficiency and demand distortions.[159] Similarly, the SEC has noted studies hypothesizing that when over 40% of trades are executed outside of lit exchanges, price quality may be disrupted due to widening spreads and an inaccurate reflection of supply and demand.[160] On the other hand, proponents of the current state of dark pool use in markets argue that limiting dark pools will make execution less efficient and deteriorate market quality because market participants would have fewer execution venues.[161]

2. *Concern from Regulators Over the Impacts of Dark Pools*

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[156] Popper, *supra* note 146.
[157] Rosov, *supra* note 121.
[158] Daniel G. Weaver, *The Trade-At Rule, Internalization, and Market Quality*, RUTGERS BUS. SCH. 7–10, 27 (Apr. 17, 2014), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1846470 [https://perma.cc/B57S-QGBL].
[159] *Id.*
[160] Aguilar, *supra* note 78 (noting that 46.7% "could be the tipping point" for when dark pool execution degrades market quality).
[161] Zhu, *supra* note 72, at 6–7.

Regulators and prominent market figures have also expressed concerns about excessive dark pool use. After the abnormally large dark pool trading volume of retail investor meme stocks, SEC Chair Gensler said that he is "looking very closely" at dark pool activity.[162] Stacey Cunningham, former NYSE President, said that "[i]n some of the meme stocks that we've seen, or stocks that have a high level of retail participation, the vast majority of order flow can trade off of exchanges, which is problematic."[163] She further noted that "price formation is not really reflective of what supply and demand is."[164] Catherine Kinney, former NYSE President, and Elisse Walter, former SEC Chair, both stated that every time a share is executed in a dark pool, it does not assist in the price discovery process, which can have negative consequences.[165]

The European Commission similarly said that "[a]n increased use of dark pools does however raise regulatory concerns as it may ultimately affect the quality of the price discovery mechanism on the 'lit' markets."[166] Finally, finance professor Craig Pirrong, said, "[o]n one hand [dark pools] provide

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[162] Ponciano, *supra* note 3.
[163] Mccrank, *supra* note 154.
[164] *Id.*
[165] Anuj Gangahar, *Banks Begin to Dip into 'Dark Pools',* FIN. TIMES (Oct. 18, 2006), https://www.ft.com/content/511e0a94-5ede-11db-afac-0000779e2340 [https://perma.cc/X9JJ-XFAA]; *see also* Chasan, *supra* note 145; *Examining the Dark Pools, Flash Orders, High-Frequency Trading, and Other Market Structure Issues: Hearing before the S. Subcomm. on Sec., Ins., and Inv. of the Comm. on Banking, Hous., and Urb. Aff.*, 111th Cong. 9–10 (2009) (statement of Elisse Walter, former President, NYSE).
[166] *Public Consultation: Review of the Markets in Financial Instruments Directive (MiFID)*, EUROPEAN COMM'N, 22 (Dec. 8, 2010), https://ec.europa.eu/finance/consultations/2010/mifid/docs/consultation_paper_en.pdf.

competition (for exchanges), on the other they probably reduce the quality of price discovery marketplaces like the New York Stock Exchange."[167] These statements demonstrate that the overuse of dark pools negatively affects price discovery, distorts demand, and is particularly detrimental to retail investors.

3. *Dark Pool Regulations in Other Countries*

In other countries with robust financial markets and regulations, dark pools are much more heavily regulated because of the problems mentioned above. Both Canada and Australia have implemented "trade-at" dark pool regulations, which force participants trading in dark pools to trade at a slight premium to the NBBO (unless they are a broker getting a better price for clients), and Australia has even implemented Minimum Executable Quantity (MEQ) requirements for dark pools.[168] Canada's regulation saw off-exchange trading decrease by almost fifty percent.[169] Researchers found that Canada's law had no effect on price efficiency and did not increase market volatility, so the goal was achieved with few, if any, negative side effects to the market because it brought liquidity back to public markets.[170] The EU's

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[167] Chasan, *supra* note 145.
[168] *Changing Business Models of Stock Exchanges and Stock Markets*, OECD 137 (2016), https://www.oecd.org/daf/ca/BFO-2016-Ch4-Stock-Exchanges.pdf; *Dark Pools in Equity Trading: Policy Concerns and Recent Developments*, CONGRESSIONAL RSCH. SERV., https://crsreports.congress.gov/product/pdf/R/R43739 [https://perma.cc/2WLE-EZEL] (last updated Sept. 26, 2014); *Report 452: Review of High-Frequency Trading and Dark Liquidity*, ASIC (Oct. 2015), https://download.asic.gov.au/media/3444836/rep452-published-26-october-2015.pdf.
[169] Carole Comerton-Forde, Katya Malinova & Andreas Park, *The Impact of the Dark Trading Rules*, INV. INDUS. REG. ORG. OF CANADA 10 (Feb. 19, 2015), https://docs.iiroc.ca/DisplayDocument.aspx?DocumentID=0BBCAC3E670E4B2AA297E7CC5F1C0B11&Language=en [https://perma.cc/T42W-SCEF].
[170] *Id.*

MiFID II was enacted to regulate dark pools after significant increases in dark pool activity.[171] Under this regulation, a single dark pool venue may only account for four percent of a security's total volume and total dark pool volume for a security may not exceed eight percent.[172] Finally, recognizing the immense regulatory and market structure concerns with dark pools, Hong Kong's Securities and Futures Commission has banned dark pool operators from accepting retail orders.[173]

4. *Limiting Excessive Dark Pool Use and Implementing Order Size Minimums*

With the above in mind, the overuse of dark pools must be addressed in U.S. financial markets; however, it is equally important to restate the necessity of dark pools and that they must *not* be banned or overregulated because they serve very important market functions—their *overuse* is what must be regulated.[174] Thus, the SEC must balance allowing dark pools to be used to execute large trades with preventing them from being overused and antagonistic to lit exchanges. To effectively balance these competing interests, a two-pronged solution is necessary.

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[171] Monica Petrescu & Michael Wedow, *Dark Pools in European Equity Markets: Emergence, Competition and Implications*, EUROPEAN CENT. BANK 4 (July 2017), https://www.ecb.europa.eu/pub/pdf/scpops/ecb.op193.en.pdf.
[172] *Id.*
[173] Reuters Staff, *Hong Kong Securities Regulator to Ban Retail Investors From 'Dark Pools'*, REUTERS (May 15, 2015, 6:42 AM), https://www.reuters.com/article/hongkong-stocks-dark/hong-kong-securities-regulator-to-ban-retail-investors-from-dark-pools-idUSKBN0O00ZW20150515 [https://perma.cc/V9YS-932H].
[174] Preece, *supra* note 153.

First, the SEC should create a "threshold list"[175] of securities whose trading volume exceeds a certain percentage for a certain period of time and implement a trade-at rule to force off-exchange participants to trade at a premium to the NBBO.[176] Rather than targeting individual venues, like Regulation ATS does, this proposal would target all off-exchange trading.[177] The SEC should exempt large block orders from this rule, which would encourage dark pools to be used for their original, useful purpose and would discourage or eliminate the overuse of dark pools.[178] Second, the SEC should implement a minimum trade size rule for off-exchange trades similar to Australia's MEQ law.[179] This would discourage overusing dark pools for retail orders but would still allow large institutional orders to be efficiently executed. BlackRock has similarly encouraged regulators to examine if exchanges should have a "minimum volume threshold" to "retain 'exchange status'" for the sake of cost and market efficiency.[180] Conversely, proponents of the current state of dark pools will argue that limiting dark pools in these

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[175] The SEC has implemented a "threshold list" of securities that see excessive failures to deliver per Regulation SHO, which has been effective since 2005. *See generally* 17 C.F.R. § 242.203 (2008) (noting restrictions on securities that meet certain "threshold" levels under the regulation).
[176] Comerton-Forde, Malinova & Park, *supra* note 169; Weaver, *supra* note 158.
[177] 17 C.F.R. § 242.301 (b)(3)–(5).
[178] Picardo, *supra* note 70; *Examining the Dark Pools, Flash Orders, High-Frequency Trading, and Other Market Structure Issues, supra* note 165 (noting a proposal to exempt block trades from trade minimum requirements and "trade-at" rules).
[179] *Report 452: Review of High-Frequency Trading and Dark Liquidity*, *supra* note 168.
[180] Barbara Novick, Richie Prager, Hubert de Jesus, Supurna VedBrat & Joanne Medero, *US Equity Market Structure: An Investor Perspective*, BLACKROCK 2 (Apr. 2014), https://www.blackrock.com/corporate/literature/whitepaper/viewpoint-us-equity-market-structure-april-2014.pdf.

circumstances could lead to increased volatility and worse executions due to there being fewer venues for execution, however, since these proposals are targeted at overuse, rather than general use, they are unlikely to have a broad negative impact, and even if so, the damaging effects to price discovery, demand distortions, and information asymmetries outweigh those consequences.[181]

D. *Market Decentralization: The Broader Effect of PFOF and Dark Pool Overuse*

The problems of PFOF and the overuse of dark pools demonstrate that the SEC's lack of regulations has allowed too much liquidity to flow off-exchange thus decentralizing markets at the cost of market quality, which disproportionately affects retail investors since their trades are "executed in ways that benefit the intermediary and not the client."[182] This section explains this decentralizing effect and presents an alternative solution: rather than regulating PFOF and dark pools directly, the SEC could regulate market decentralization, the effect of PFOF and dark pool overuse, directly at the exchange level.[183]

SEC Chair Gensler has been particularly vocal about market decentralization, PFOF, and dark pools. First, in an interview with Jim Cramer, Gensler spoke extensively about how both PFOF and dark pools

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[181] Zhu, *supra* note 72.
[182] Jonathan Macey & David Swensen, *The Cure for Stock-Market Fragmentation: More Exchanges*, WALL ST. J. (May 31, 2015), https://www.wsj.com/articles/the-cure-for-stock-market-fragmentation-more-exchanges-1433109068 [https://perma.cc/8T35-YRJN].
[183] *Id.*

have decentralized markets to the detriment of retail investors and market quality.[184] Gensler stated:

> [W]e have something in America where nearly half of the trading is going to dark pools and to the wholesalers … that dominate and concentrate the market, and even that which is on the so-called lit markets, the New York Stock Exchange and NASDAQ, many of the trades there are not being fully displayed. So this concept of price improvement is against a measuring stick, which is a measuring stick that's not fully reflective of the market, our consolidated tape, our national best bid, best offer so to speak, does not reflect the half and the dark markets. It doesn't even reflect a lot that's on the exchanges. So if you or I make a trade, a market order retail trade, where does it go? 90 plus percent chance it goes to a handful of wholesalers.[185]

This statement demonstrates that both dark pools and PFOF arrangements with wholesalers are siphoning retail liquidity from lit markets, thus decentralizing them, and are making markets much less competitive to the point where there are spillover effects on lit exchanges and the NBBO.[186]

Second, Gensler recently discussed how PFOF and dark pool overuse have "segmented" and "concentrated" U.S. markets.[187] According to Gensler, markets have become segmented because of a drastic increase in off-exchange trading; Gensler states that forty-seven percent of orders are executed off-exchange (nine percent from dark pools and thirty-eight percent from wholesalers).[188] Markets have become concentrated because there are

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[184] *CNBC Exclusive: CNBC Transcript: SEC Chair Gary Gensler Speaks with CNBC's "Squawk on the Street" Today*, CNBC (Sept. 15, 2021, 12:36 PM), https://www.cnbc.com/2021/09/15/cnbc-exclusive-cnbc-transcript-sec-chair-gary-gensler-speaks-with-cnbcs-squawk-on-the-street-today.html [https://perma.cc/U7NW-DAY9].
[185] *Id.*
[186] *Id.*
[187] Gensler, *supra* note 30.
[188] *Id.*

only seven wholesalers who account for the “vast majority” of the thirty-eight percent figure referenced above.[189] Compared to the numerous market makers on lit exchanges, these seven wholesalers have far less competition and incentives to offer the lowest competitive price for securities.[190] Thus, the proliferation of off-exchange trading (due to PFOF and dark pools) has decentralized order routing and execution in U.S. markets into distinct segments based on the experience of the investor making the order, which leads to inefficiencies and demand distortions in the market that broker-dealers profit from at the expense of market participants.[191]

The concentration and segmentation of the market has created a feedback loop that allows off-exchange wholesalers and dark pool overuse to exist at the expense of retail investors.[192] Since forty-seven percent of trades are executed off-exchange, “dumb money” retail trades are selectively routed and executed off-exchange, while “smart money” trades are executed on-exchange or in non-wholesaler dark pools (causing the aforementioned demand distortions).[193] This becomes a problem since market makers adjust their spreads based on demand and how risky taking the other side of a trade is, so when most orders on a public exchange are smart money rather than a mix of dumb and smart money, and demand is distorted, market makers have to widen their spreads because taking the other side of the trade is riskier

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[189] *Id.*
[190] *Id.*
[191] *Payment for Order Flow*, *supra* note 71, at 2.
[192] Gensler, *supra* note 30.
[193] Battalio & Loughran, *supra* note 80; *Payment for Order Flow*, *supra* note 71, at 11.

because the investor is likely more sophisticated.[194] A wider bid-ask spread means the NBBO will be less competitive.[195] A less competitive NBBO allows the wholesalers to execute trades at a lower price than exchanges, which is why PFOF is so profitable and pervasive and why some research finds that it leads to lower costs than public exchanges.[196] However, because there are so few players in this wholesaler group, they do not need to compete for the lowest price as fiercely as lit exchange market makers do.[197]

In other words, wholesalers created a problem and are profiting from it—by siphoning liquidity off-exchange, wholesalers have made public exchanges riskier for market makers, which degrades the NBBO and gives wholesalers an execution advantage over on-exchange market makers thus increasing prices for all participants except the wholesalers who profit from this increased price.[198] The vast regulations on PFOF and dark pool overuse in other countries highlighted in Section III are probably why Gensler described this issue as an *American* problem rather than a global problem in his statement above.[199]

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[194] *Payment for Order Flow*, *supra* note 71, at 4–5, 10; Hitesh Mittal & Kathryn Berkow, *The Good, the Bad & the Ugly of Payment for Order Flow*, BESTEX RSCH. 11–13 (May 3, 2021), https://f.hubspotusercontent10.net/hubfs/4982966/BestEx%20Research%20PFOF%2020210503.pdf.

[195] Palmer, *supra* note 14.

[196] Mittal & Berkow, *supra* note 194, at 8–14; Battalio & Loughran, *supra* note 80, at 39–40; Gensler, *supra* note 119; *CNBC Exclusive*, *supra* note 184; *Payment for Order Flow, supra* note 71, at 8–9.

[197] Gensler, *supra* note 30.

[198] Mittal & Berkow, *supra* note 194, at 8–14; Battalio & Loughran, *supra* note 80, at 39–40; Gensler, *supra* note 119; *Payment for Order Flow*, *supra* note 71, at 8–9.

[199] *CNBC Exclusive*, *supra* note 184.

If the SEC does not want to address PFOF and dark pool problems directly but wants to address the market decentralization that they have created, it should adopt the solutions offered by Jonathan Macey, a prominent corporate and securities law professor.[200] Macey explains that fragmentation, due to the decentralized order routing and execution processes explained above, "degrades market quality as trades are scattered across multiple venues and investors lose opportunities to interact directly with one another."[201] To remedy the decentralization of equity markets, the solution is not to consolidate markets to a few exchanges because that would create an anti-competition problem.[202] Rather, Macey advocates for *more* exchanges but limiting the trading of a particular security to a single exchange, which would shift competition for lower transaction costs to exchanges rather than intermediaries.[203] Macey further advocates for a shareholder primacy solution that would allow shareholders to vote on which exchange their stock is listed on, thus increasing the pressure on exchanges to be competitive.[204] Macey argues that this "would increase market depth and liquidity, eliminate deadweight loss from arbitrage by HFTs, increase transparency and return competition to secondary market trading in equities" thus solving the decentralization problem without creating a consolidation problem.[205]

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[200] Macey & Swensen, *supra* note 182.
[201] *Id.*
[202] *Id.*
[203] *Id.*
[204] *Id.*
[205] *Id.*

Therefore, the SEC has several options to address the problems articulated in this note: it can either address PFOF and dark pools directly, or it can address the decentralization caused by those practices directly. Either way, the solutions suggested are necessary to bring siphoned liquidity from off-exchange venues back to public markets for the protection of retail investors and market quality.

E. *Broader Effects of the Solutions Presented*

Beyond the direct effects of the solutions presented above, broader effects on market participants are likely. Specifically, the solutions may increase market transparency and public perceptions of financial markets, which could strengthen the public's low trust in financial markets.[206] A lack of trust in financial markets is one of the leading reasons why people choose not to participate in financial markets.[207] Participation in financial markets is important for retirement security and creating generational wealth, and higher rates of participation may have positive, stabilizing effects on the economy and markets.[208] The success of Robinhood highlights reasons why

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[206] *Id.*; O'Brien, *supra* note 15.
[207] Luigi Guiso, Paola Sapienza & Luigi Zingales, *Trusting the Stock Market*, 63 J. OF FIN. No. 6 2557, 2559 (Dec. 2008), https://www.kellogg.northwestern.edu/faculty/sapienza/htm/trusting_stock.pdf; Jill E. Fisch & Jason S. Seligman, *Trust, Financial Literacy, and Financial Market Participation*, J. OF PENSION ECON. & FIN. 1, 1 (Apr. 1, 2021), https://www.cambridge.org/core/journals/journal-of-pension-economics-and-finance/article/abs/trust-financial-literacy-and-financial-market-participation/03A77810B7E4AD1BCF1E5DC7E6DAF0C8 [https://perma.cc/LC2X-4KPX].
[208] Fisch & Seligman, *supra* note 207; Juan M. Morelli, *Limited Participation in Equity Markets and Business Cycles*, Finance and Economics Discussion Series 2021-026, BD. OF GOVERNORS OF THE FED. RSRV. SYS. (Apr. 2021)

these solutions may increase the public's trust in financial markets. Robinhood was able to become a prominent name in the financial world in only a few years exclusively through retail clients through its mission to "democratize finance for all."[209] Robinhood's easy-to-use platform, low barriers to entry, and advertisements claiming it was designed for retail investors demonstrate that fairness, transparency, and low barriers to entry are extraordinarily important to retail investors.[210] Therefore, if the SEC implements the above solutions, the public may see this as a step to increase the transparency and fairness of financial markets and may react positively.

Moreover, it is in the SEC's interest to implement these solutions since they directly address several prongs of the SEC's mission statement. The SEC's mission is to "protect investors; maintain fair, orderly, and efficient markets; and facilitate capital formation" and the SEC "strives to promote a market environment that is worthy of the public's trust."[211] Regulating dark pools and PFOF would protect retail investors, increase market fairness, increase market efficiency, and give the public more reasons to trust financial markets. Finally, courts have repeatedly ruled that the SEC's role as a

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https://www.federalreserve.gov/econres/feds/files/2021026pap.pdf; Arash Aloosh, Hyung-Eun Choi & Samuel Ouzan, *The Tail Wagging the Dog: How Do Meme Stocks Affect Market Efficiency?*, 3, 9 (Mar. 22, 2022), https://papers.ssrn.com/sol3/papers.cfm?abstractid=3839832 [https://perma.cc/997F-ZQPR].

[209] Spilka, *supra* note 10; *Our Mission*, ROBINHOOD, https://robinhood.com/us/en/support/articles/our-mission/ [https://perma.cc/A4MH-PBNP] (last visited Feb. 16, 2022).

[210] Spilka, *supra* note 10.

[211] *About the SEC*, SEC, https://www.sec.gov/about.shtml [https://perma.cc/SN88-B3UN] (last visited Feb. 18, 2022).

"competition regulator" is one of its most important functions, so the concentration and segmentation caused by PFOF and dark pool overuse are particularly relevant and in need of SEC action.[212]

IV. CONCLUSION

Though the United States has the most robust, liquid financial markets in the world, the pervasive problems associated with increased decentralization show that much more regulation is still needed.[213] As stated by former Citadel trader Dave Lauer, "[t]his is not the market structure you would design if you were starting from scratch."[214] The unnecessary complexity and decentralization of the current market structure due to PFOF and the overuse of dark pools is both degrading market quality and degrading public trust in markets.[215] With retail investor presence in the market and anti-Wall Street sentiment increasing,[216] it is paramount for the SEC to adequately address the decentralizing effects of PFOF and dark pool overuse on financial markets. The United States government has a track record of

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[212] *See generally* J.W. Verret, *Robinhood's Threat to Sue the SEC Over Broker-Inducement Regulation Unlikely to Succeed*, GEO. MASON U.L. & ECON. RSCH. PAPER SERIES 21 (Nov. 30, 2021), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3974960 [https://perma.cc/R7YA-R4HW]; *see, e.g.*, Susquehanna Int'l Grp., LLP v. SEC, 866 F.3d 442 (D.C. Cir. 2017); *see, e.g.*, Credit Suisse Sec. (USA) LLC v. Billing, 551 U.S. 264 (2007).

[213] *Financial Services Spotlight: The Financial Services Industry in the United States*, SELECTUSA, https://www.selectusa.gov/financial-services-industry-united-states#:~:text=Overview,of%20U.S.%20gross%20domestic%20product [https://perma.cc/RA88-9JRT] (last visited Feb. 18, 2022).

[214] Melissa Lee, *'The Market Is Broken,' Says Former Citadel Trader*, CNBC (June 17, 2021, 6:06 PM), https://www.cnbc.com/video/2021/06/17/the-market-is-broken-says-former-citadel-trader.html [https://perma.cc/ARL4-5RT2].

[215] Novick, Prager, de Jesus, VedBrat, & Medero, *supra* note 180; Macey & Swensen, *supra* note 182.

[216] Von Hoffman, *supra* note 16.

being reactive rather than proactive to financial regulation by only imposing regulations after a crisis happens.[217] Instead of taking the reactive approach, the U.S. should be proactive in safeguarding the quality of its financial markets for all participants by implementing the solutions presented in this note.

[217] The Securities Acts of 1933 and 1934, Sarbanes-Oxley Act, and Dodd-Frank Act, four of the most influential, authoritative financial laws in the U.S. were all passed in response to financial crises rather than proactively to prevent financial crises. *See generally* Legal Information Institute, *Securities Law History*, CORNELL L. SCH. LEGAL INFO. INST., https://www.law.cornell.edu/wex/securities_law_history [https://perma.cc/3NZ8-5CCK] (last visited Feb. 19, 2022).