Post-Crisis Financialization Through Product Innovation: Assessing Complexity, Growth & Design In Exchange Traded Funds

Doctoral Dissertation

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Abstract

This dissertation examines emerging risks and regulatory concerns in exchange traded funds (ETFs). It makes four core arguments through four published or accepted (and forthcoming) law review articles, alongside two published blog posts, all of which were written and previously submitted to the SJD Committee during the author’s dissertation research period. These articles are organized herein as dissertation chapters together with a contextual introduction and a summary conclusion which frames the dissertation within the scholarly literature on economic “financialization,” and emerging challenges associated with the growth of large interconnected asset managers.

The four core arguments in this dissertation are as follows. First, ETFs are operationally reliant on the discretionary behaviors of independent financial market intermediaries with instabilities that resemble prior financial products including auction rate securities, portfolio insurance and money market mutual funds. Second, there is growing support that index products (including ETFs, other exchange traded products, and index mutual funds) are contributing to market inefficiency and the formation of collective investor behaviors. Third, ETFs, and their sponsors, are creating deep and complex interconnections between numerous market participants and service providers, down to retail and institutional investors, affecting corporate behaviors and decision making. These connections generate new direct and indirect systemic risk transmission pathways, with unique factors not found in other managed asset products. Fourth, ETFs are incredibly difficult, and in some cases impossible, to accurately compare side-by-side. Product and performance comparisons would be materially improved with standardized website formats and layouts, uniform calculation methodologies, the imposition of an ETF naming convention, standards for sustainable investment products, and a systematized and structured electronic reporting system of key variables to a centrally-hosted data repository.

The dissertation provides extensive support, and a diverse variety of applied case studies, in favor of each of the four core arguments. It also includes a unique (and timely) contextual analysis of the events of March 2020 and the resulting impact on ETFs due to the coronavirus pandemic - including the historically unprecedented intervention in the credit ETF market by the Federal Reserve. Given these four core emerging risks and regulatory concerns, the dissertation provides three recommendations. First, greater regulatory scrutiny and safeguards for giant interconnected asset managers. Second, enhanced controls over credit ETF origination, liquidity transformation, and “cash-like” tradeable investment products. Third, additional investor-focused disclosure reforms to ease ETF product comparisons.
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Introduction

The diversity, depth, and complexity of tradeable investment products has grown tremendously in the U.S. over the last fifty years. As a result, a tradable financial instrument represents nearly every real economic interest, and the number of assets under professional management, the amount of money in the “market”, the variety and supply of available financial products, the depth of “credit intermediation” for both businesses and households, and the breadth of “shadow banking” continues to expand. Financial product innovation did not disappear as a result of the 2008 global financial crisis (“GFC”). Rather, nascent financial product innovation has flourished post-GFC in the exchange traded product (ETP) market - led by the most successful ETP of all, the exchange traded fund (ETF).

This dissertation assesses emerging risks and regulatory concerns in ETP innovation, with a specific focus on ETFs - materially the largest product segment. As a cumulative submission it is perhaps the most comprehensive single product on emerging ETF instabilities to date in the academic literature. It answers four broad, but related, investigative questions. First, do ETFs have design similarities that resemble financial product instabilities from the past? Second, are ETPs, ETFs, and other index products contributing to less efficient


2 See Servaas Storm, Financial Markets Have Taken Over The Economy. To Prevent Another Crisis, They Must Be Brought To Heel, INSTITUTE FOR NEW ECONOMIC THINKING (February 13, 2018), https://www.inedconomics.org/perspectives/blog/financial-markets-have-taken-over-the-economy-to-stop-the-next-crisis-they-must-be-brought-to-heel.

3 See Zoltan Pozsar, Tobias Adrian, Adam Ashcraft & Haley Boesky, Shadow Banking, FEDERAL RESERVE BANK OF NEW YORK STAFF REPORT 458, 458 (2010) (defining shadow banking as “financial intermediaries that conduct maturity, credit, and liquidity transformation without explicit access to central bank liquidity or public sector credit guarantees.”); see Mark Vandevelde & Sujeet Indap, Apollo: how a private equity giant is navigating the crisis, FINANCIAL TIMES (April 28, 2020), https://www.ft.com/content/6fcee9808-84ab-11ea-b555-37a289098206 (discussing the rise of shadow banking in the private equity industry).


markets? Third, do ETFs create new systemic risks, and (relatedly) could the largest asset managers that sponsor ETFs become systemically important to the financial system? Fourth, what challenges do investors face when they attempt to compare ETFs and their performance side by side?

These four questions are answered in the dissertation as follows. First, ETFs are operationally reliant on the discretionary behaviors of independent financial market intermediaries, and thus resemble instabilities in prior financial products including auction rate securities, portfolio insurance and money market mutual funds. These product instabilities were revealed during the coronavirus pandemic. Second, index products (including ETFs, ETPs, and index mutual funds) are contributing to market inefficiency and the formation of collective investor behaviors. Third, ETFs, and their sponsors, are creating deep and complex interconnections between numerous market participants and service providers, retail and institutional investors, and corporations, with new direct and indirect systemic risk transmission pathways and unique factors not found in other managed asset products. Fourth, ETFs are incredibly difficult (in some cases impossible) to accurately compare side-by-side. Product and performance comparisons would be materially improved with standardized website formats and layouts, uniform calculation methodologies, the imposition of ETF naming conventions, and a systematized and structured electronic reporting system of key variables to a centrally hosted data repository.

The dissertation is formatted and presented with this introduction, five substantive chapters, a concluding section, and a full bibliography. Each chapter is an article (and in the case of Chapter Two, two separate media articles) that have either been independently published as a full law review article during the course of the dissertation writing period, or have been accepted as forthcoming to be published. Links to independent publication sources are provided in the respective Chapter headings. The cumulative product of this dissertation includes four separate and independent full law review articles and two media articles. Also, the author has discussed his work in various media, conference presentations, webinars, and podcasts, all of which the SJD Committee has been previously advised.

Further, the dissertation provides three core recommendations for the ETF sector (also applicable to other ETPs). First, a call for greater scrutiny and safeguards for giant interconnected asset managers (who are also the world’s largest ETF sponsors). Second, enhanced regulatory controls over credit ETF origination, liquidity transformation, and the proliferation of “cash-like”
tradeable investment products. Third, additional investor-focused disclosure reforms to ease ETF product comparisons.

ETPs – with a concentrated focus on ETFs – were chosen as the subject matter of this doctoral dissertation for several reasons. First, they have experienced remarkable post-GFC growth. Recent estimates suggest that the number of available ETFs have more than quadrupled since 2008, with almost nine times market capitalization growth.\(^6\) Further, there are a myriad of additional reasons, which will become evident throughout this dissertation, that support academic interest in ETFs. This includes, among others: the way these products experience viral replication, create new systemic risks and economic concentration, contribute to market inefficiency, utilize synthetics, leverage and derivatives, exhibit similarities to instabilities in prior financial products, obscure investor comparisons, align with emerging studies on economic “financialization,” and give rise to a host of regulatory considerations.

The four investigative questions allow for both a micro-level analysis on the unique risks of the products themselves, and the challenges investors face in understanding these risks and conducting product comparisons; and a macro-level analysis on how these products, and the firms that sponsor them, are contributing to systemic risk and general market instabilities. Each investigative channel navigates applicable regulations, presents numerous specific case studies to illustrate concerns, advocates for areas of needed regulatory reform, and points to additional investigation worthy of future study. The four specific investigative questions, and how they are answered in the dissertation, are as follows.

The first investigative question asks whether ETFs have design similarities that resemble financial product instabilities from the past? Particularly, it investigates the extent that ETFs rely on financial intermediaries (who operate with discretionary incentives) for their smooth operation; and whether they offer the promise of perpetual liquidity which could prove illusive in a crisis. This question is answered in Chapter One (a reproduction of an article published in Volume 20 (January 2020) of the *Houston Business and Tax Law*

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\(^6\) *ETFGI Global* reports that from 2008 to 2019 the number of ETFs worldwide grew from 1617 to 6940, while the value of assets held in ETF products, during the same period also grew from $716 billion to over $6 trillion. See *ETFGI, ETFGI report assets in the global ETFs and ETPs industry which will turn 30 years old in March started the new decade with a record 6.35 trillion US dollars* (January 16, 2020), https://etfgi.com/news/press-releases/2020/01/etfgi-reports-assets-global-etfs-and-etps-industry-which-will-turn-30.
ETFs exhibit similarities to portfolio insurance in the lead up to the October 19, 1987 “Black Monday” stock market crash, and auction rate securities (ARS) which failed during the GFC. Both products contributed to market instabilities during periods of financial panic. The events of March 2020 and the coronavirus pandemic (which are noted in the introduction below, and prominently discussed in Chapters Two, Four and Five) provide additional support to an affirmative answer to this first investigative question. The coronavirus pandemic, and the Federal Reserve’s historically unprecedented support for ETFs in an effort to stabilize credit markets (an event which is discussed extensively below and in Chapters Two, Four and Five), also provide support that cash-like ETFs resemble fragilities in Money Market Mutual Funds (MMMFs).

The operational reliance on independent discretionary actors in ETFs creates a unique risk that intermediaries can stop providing liquidity, or performing arbitrage, if it suits them to do so, during periods of market instability. This risk doesn’t exist, to the same extent, in other index products (like index mutual funds), but it was exhibited in both ARS and portfolio insurance. Chapters Two and Five highlight how this risk manifested during the March 2020 market sell-off associated with the coronavirus pandemic, resulting in unprecedented instability and ETF trading price dislocations from their net

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11 See infra, Chapters Two, Four & Five.
asset value (NAV), and intervention by the Federal Reserve. Given this instability, and the growing importance of ETFs in financial markets these various Chapters advocate for heightened regulatory safeguards and academic attention in the ETF market.

The second investigative question asks whether ETPs, ETFs and other index products are contributing to less efficient markets? Here two sub-channels are investigated. First, what role do index products play in coordinating destructive and volatile collective behaviors like information cascades, investor herds, and financial contagion? Second, to what extent are ETFs, along with other index-tracking products, distorting the informational value of underlying asset and securities prices, and disincentivizing active price discovery, in a way that masks market risk? This second investigative question is largely answered in Chapter Three, an article that is accepted to be published in the Spring 2021 edition of the Houston Business and Tax Law Journal,\(^{12}\) with related discussions in Chapters Two, Four and Five (in relation to the events associated with the coronavirus pandemic and the Fed’s unprecedented intervention to ward off further systemic impacts). These Chapters build on the theoretical underpinnings of Chapter One by showing that despite their popularity, index products (including ETPs and ETFs) may also be making the financial system less stable and decreasing market efficiency.

In answering (in the affirmative) this second investigative question, Chapter Three also posits that ETPs and ETFs may be introducing two “interaction risks” into financial markets due to their complex (and opaque) operational and trading ecosystem. First, ETFs could be contributing to information cascades, facilitating investor herding, and increasing the potential for financial contagion and feedback selling between ETF and underlying asset markets. Second, ETFs, ETPs and other index-based products (including index mutual funds), could be distorting the informational responsiveness and efficiency of underlying asset and securities prices, and disincentivizing active price discovery, in a way that masks market risk.

The third investigative question asks whether ETFs create any new systemic risks, and (relatedly) could the largest asset managers that sponsor these products become systemically important to the financial system? This question is answered in Chapter Four - a reproduction of an article published in Volume 22, Issue 4 (August 2020) of the University of Pennsylvania Journal of Business

Law.\textsuperscript{13} It argues that ETF’s success could be making some asset managers “too interconnected to fail.” It illustrates how ETFs, and their sponsors, are creating deep and complex interconnections between numerous market participants and service providers, down to retail and institutional investors, and affecting corporate behaviors and decision making.

Chapter Four also shows how these connections generate new direct and indirect systemic risk transmission pathways, with unique factors not found in other managed asset products. It then shows how the effective monitoring of ETF systemic risk requires a cross-market analysis to assess the collective behaviors of numerous participants in a complex and interconnected operating ecosystem, and how both activity and entity-level oversight is prudent. It suggests that despite ETF firms being distinct from banks and insurance companies, there’s merit in imposing heightened regulatory parameters given their centrality in a highly interconnected ecosystem, the way they disseminate “cash like” ETFs, and the way the government intervened in, and supported the ETF market during the COVID-19 crisis.\textsuperscript{14} Details of the Fed’s intervention, and how ETFs add to the transmission of systemic risk and instability during a crisis is also illustrated in Chapters Two and Five.\textsuperscript{15}

The fourth investigative question asks what challenges investors face when they attempt to compare ETFs and their performance side by side? This question is answered in Chapter Five (an article that is accepted and forthcoming to be published in the Virginia Law & Business Review).\textsuperscript{16} This Chapter reveals that, despite their central use in modern capital markets, ETFs are incredibly difficult to accurately compare side-by-side. Investors face concurrent challenges of product choice overload, opaque index construction methodology, and a wide array of discretionary operational, management, marketing, and financial practices of ETF sponsors that undermine simple product and performance comparisons.\textsuperscript{17} The challenge in comparing ETFs is compounded by disclosure effectiveness limitations given investor cognitive tendencies and behavioral inclinations.\textsuperscript{18}

\begin{itemize}
\item[\textsuperscript{14}] See infra, Chapter Two, Four & Five.
\item[\textsuperscript{15}] See infra, Chapter Two & Five.
\item[\textsuperscript{16}] See Clements, supra note 10.
\item[\textsuperscript{17}] See infra, Chapter Five.
\item[\textsuperscript{18}] Id.
\end{itemize}
Chapter Five also advocates for continued investor-focused reform in ETFs, building off encouraging actions recently taken by the *U.S. Securities & Exchange Commission* in its 2019 “Rule 6c-11” under the Investment Company Act of 1940.\textsuperscript{19} This chapter makes several recommendations to improve ETF product comparisons including standardizing website formats and layouts for information presentation, uniform calculation methodologies of key ETF variables, an ETF naming convention, and standard terms for sustainable investment products. ETF investors would also greatly benefit from a systematized and structured electronic reporting mechanism where standardized data could be provided by ETF sponsors to a centrally controlled public repository.\textsuperscript{20}

In answering these four questions the dissertation extensively illuminates the history, demand factors, institutional and cultural back-story of ETPs and ETFs. It provides descriptive statistics of the market size, product variety, and uses by both retail and institutional investors. It identifies the various parties (and incentives) that exist in a complex and opaque operational ecosystem, reliant on a novel but discretionary “arbitrage” mechanism. It also establishes parallels between ETP and ETF innovation, intermediary incentives, product structure and design, and the use of leverage and derivatives, with financial products from the past. It shows how ETFs, and the increasingly centralized firms who control their dissemination, are generating new systemic risks through interconnectivity; and how current regulatory structures in the U.S. are insufficient to adequately curtail such risks. Finally, it reveals how industry discretion and disclosure inefficiencies are undermining investor efforts to perform simple “side-by-side” ETF product comparisons.

The cumulative product of this work fits squarely within a growing body of scholarship on the externalities associated with economic “financialization” and financial product innovation – topics which will be discussed in the dissertation’s conclusion.\textsuperscript{21} It also relates to the work of Hyman Minsky and his “*Money Manager Capitalism Hypothesis*” (MMCH).\textsuperscript{22} Minsky’s “financial

\textsuperscript{20} See infra, Chapter Five.
\textsuperscript{21} See infra, Conclusion.
instability hypothesis” (which has grown in prominence since the GFC) theorized a cyclical pattern whereby banks and other financial intermediaries endogenously destabilize the financial system by introducing increasingly risky credit and financial products while searching for profits during periods of economic tranquility.23

Yet in lesser known, but equally prescient scholarship, Minsky cautioned against the disruptive impact that large asset managers might have on the financial and economic system.24 The MMCH posits that financial markets evolve due to the profit seeking activities of financial firms themselves, not just those businesses undertaking traditional or “productive” enterprises, and that this makes the financial system more fragile, while increasing the size and power of the largest financial intermediaries.25 This dissertation, including its intra-chapter discussions of the ETF market during the coronavirus pandemic, compliments the MMCH as it shows how the financial system is becoming more interconnected, more volatile, and less stable because of the proliferation of ETFs, while the firms that propagate these products are becoming increasingly powerful and influential, not just within the economic system but also to governments themselves.26

An unprecedented market event (the coronavirus pandemic), that occurred during the writing of this dissertation, facilitated a live observational environment to test the author’s investigations relating to ETF product instability, and the systemic influence of the largest ETF issuers. As such, extensive commentary relating to ETF behavior and fallout during the coronavirus pandemic is featured prominently in Chapters Two, Four and Five.27 A brief overview of these events, and the resulting regulatory and scholarly ramifications is provided here as follows.

24 See Wray supra note 22.
25 See H.P Minsky, Schumpeter and finance, in Salvatore Biasco, Alessandro Roncaglia, and Michele Salvati (eds), MARKET AND INSTITUTIONS IN ECONOMIC DEVELOPMENT: ESSAYS IN HONOUR OF PAULO SYLOS LABINI (1993).
26 See infra, Chapters One, Two, Three & Five.
27 See infra, Chapter Two, Four, Five.
In March 2020, as the market grasped the potential impact of the pandemic, historic price discounts from net asset value (NAV) emerged in the secondary market trading prices of a wide variety of ETFs. Corporate credit (particularly high-yield and “junk bond” varieties) and emerging market ETFs were the most severely impacted, and these products exhibited unprecedented trading price discounts from NAV. Trading discounts from NAV were also witnessed, however, in normally “ultra-stable” short-maturity bond ETFs.

The trading price discounts from NAV in bond ETFs occurred because critical financial market intermediaries in the ETF ecosystem (authorized participants or “APs” – prominent market players who will be featured throughout this dissertation) and other market makers stopped performing arbitrage in credit ETFs as liquidity and trading volume in underlying bond markets disappeared. Bond markets became opaque, volatile and expensive (manifest through increasingly widened bid-ask spreads), and APs, who were also managing their own risks during this period of increasing uncertainty, backed away from performing the critical arbitrage function that’s necessary to align ETF trading prices with their underlying NAV.

Chapter One of this dissertation contends that ETFs rely on financial intermediaries (these APs who create and redeem ETFs directly with ETF


31 See infra, Chapter One, Four & Five.


33 See id.

34 See Aramonte & Avalos, supra note 29 at 1-4.
sponsors, as well as market makers who assist in arbitrage and price to NAV coupling through secondary market selling operations). These intermediaries operate with discretionary incentives, not legal obligations, and ETFs rely on them for their smooth operation and stability. Chapter One analogizes ETFs to both auction rate securities (ARS) in 2008, and portfolio insurance in 1987 given a similar reliance on intermediaries with discretionary incentives. The events that materialized in the ETF market during the initial coronavirus pandemic sell-off strengthens the comparison to both products.

The ARS market needed financial intermediaries to provide liquidity support to ARS product auctions (despite being under no legal obligation to do so), and the ARS market failed when dealers withdrew from the market as their internal risk profile changed due to losses from the 2008 crisis. In the ETF market during the March 2020 sell-off bond dealers stopped supporting fixed income markets, and this uncertainty materially impaired the arbitrage function leading to historic price discounts from NAV. Also, the breakdown of arbitrage performance in ETFs by APs and market makers during the worst of the March 2020 sell-off strengthens the comparisons to the events of October 19, 1987 ("Black Monday") when index futures and cash prices decoupled because arbitrageurs couldn’t accurately assess prices in the midst of the panic, and thus retreated undermining market stability and exacerbating the sell-off.

Dramatic price dislocations persisted in credit ETFs until the Federal Reserve intervened (for the first time ever in the ETF market) with its Secondary Market Corporate Credit Facility (SMCCF), and only after that point did ETF prices realign with their underlying NAV. Prior to the SMCCF the Federal

35 See infra, Chapter One.
37 Id. at 45-51.
38 Id.
Reserve had never purchased credit ETFs; yet they felt such an unprecedented move was necessary to stabilize markets, bank exposure to risk, and prevent further runs on underlying bonds and other fixed income products (like fixed income mutual funds).

The Fed’s move to purchase ETFs is controversial since BlackRock (the world’s largest ETF sponsor – another entity which will be prominently featured throughout this dissertation) was given a no-bid contract to oversee ETF purchases, and a mandate to even purchase its own funds. As this dissertation will show, conflict fears have materialized as a significant number of the Fed financed ETFs have been BlackRock products.

The coronavirus pandemic crisis is also significant because it lends support to contentions in Chapters Four and Five that ETFs are being used as cash substitutes, and thus should be subject to enhanced prudential regulation. It also provides comparative support that certain types of ETFs (short-duration credit products) are analogous to money market mutual funds ( MMMFs), which were also used as cash substitutes in the lead up to the 2008 crisis and also needed government support after investing in risky asset-backed commercial paper.

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47 See infra, Chapter Four.


The Fed’s support of short-duration credit ETFs in the coronavirus pandemic, and these product’s act of “liquidity transformation” in turning illiquid bonds into cash substitutes (a concept that will be discussed extensively throughout the dissertation, particularly in Chapters Four and Five), has similarities to the MMMF market in 2008. Given these similarities Chapters Four and Five advocate for additional investigation into whether MMMF safeguards, such as prophylactic mechanisms, stress tests, additional disclosures, and primary market creation and redemption safeguards could also be applicable to ETFs.

In conclusion, there are three core recommendations that emerge from the cumulative product of this dissertation. First, there is a need for greater regulatory scrutiny and enhanced safeguards for the largest interconnected asset managers (the “mega” ETF sponsors). As this dissertation (particularly Chapter Four, but also Chapters Two and Five) will reveal, some ETF sponsors may becoming “too interconnected to fail” resulting in growing levels of economic (and market) concentration, complex layers of operational interconnectivity, the introduction of new systemic risks, model risks (such as Aladdin), and government influence (primarily BlackRock). Enhanced safeguards are warranted given their central interconnection in a complex financial ecosystem, as well as the unprecedented Federal Reserve support for ETF markets during the coronavirus pandemic, their interconnection and relationship to credit markets, and the way BlackRock and other major ETF sponsors have benefited from governmental intervention.


50 See infra, Chapters Four & Five.  

51 See Clements, supra note 13 at 70; see infra, Chapters Four & Five.  


53 See infra, Chapter Four & Five.  

54 See id.
like” investment products from asset managers. These are the fastest growing ETF market segments. As noted in Chapters Two and Five, credit and “cash like” ETFs exhibited historic secondary market price dislocations from net asset value during the early stages of the coronavirus pandemic while performing “liquidity transformation” on underlying bonds. These products revealed arbitrage fragility and financial intermediary “step-away” risk (as identified in Chapter One) and investor herd risk (as identified in Chapter Three), strengthening comparisons throughout this dissertation to ARS, portfolio insurance, and MMMFs. Further, this new “implicit backstop” of the Federal Reserve to the ETF market reveals the extent of credit ETF “interconnection” to the real economy, and the potential for contagion and feedback selling to underlying bond market and mutual funds, while industry trends also flag new credit moral hazard and “originate to distribute” risks.

The third recommendation from this dissertation is that the ETF industry would greatly benefit from additional “investor-focused” reforms to ease the plight of investors who attempt to assess products side-by-side. As will become evident from Chapter Five, it is extremely difficult (if not impossible in some cases) to accurately compare ETFs against each other. Given the variety of ETF specific risks, the opacity of the ETF operational ecosystem, and the documented performance instabilities in this sector, further investor-focused reforms are a worthwhile regulatory undertaking. As detailed in Chapter Five, there is a strong impetus for standardized website formats, uniform calculation methodologies, the imposition of ETF naming conventions, and a systematized and structured electronic reporting of key variables to central repository.

55 See infra, Chapter Two & Five.
56 See infra, Chapter One.
57 See infra, Chapter Three.
58 See infra, Chapter Four & Five.
59 See infra, Chapter Five.
60 Id.
Chapter I: Exchange Traded Funds & “Liquidity Illusions”

The following chapter was published in January 2020 at 20 Hou. Bus. & Tax L. J. 15 (2020) as “New Funds, Familiar Fears: Do Exchange Traded Funds Make Markets Less Stable? Part I, Liquidity Illusions” and is available online here:

i. Abstract

Since the 2008 global financial crisis, Exchange Traded Funds (ETFs) have exploded in popularity. An ETF is an investment product that tracks an underlying index or basket of assets, such as securities, bonds, or commodities. However, unlike other types of popular investment products—like mutual funds—ETFs trade like stocks. Thus, many view ETFs as superior to mutual funds because they give average investors instant, low-cost diversification in a product that can be bought or sold throughout the trading day on a national exchange.

ETFs will likely house a sizeable share of American retirement savings in the future as they become the preferred investment vehicle for institutions, high frequency traders, and wealth managers. This shift, however, could also present a worrisome risk. While ETFs appear to offer the benefits of lower transaction costs and the ability to buy or sell quickly, this near-perfect liquidity could prove illusory when it matters most: during a market crash or a full-blown financial crisis. This two-part study investigates interaction risks in the ETF market. This Article shows how ETFs can create liquidity risk by operating in a complex ecosystem that is dependent on the discretionary behaviors of financial institutions. Case studies on portfolio insurance in the 1980’s and the auction rate securities market failure in 2008 also illustrate how reliance on discretionary actors to provide liquidity and perform arbitrage in a crisis can be illusory and fragile.

It is impossible to predict exactly how or when a new crisis will arrive. Yet, the popularity of ETFs as an asset class, the increased connection between Main Street and Wall Street, the potential liquidity risks, and the long-term uncertainty about the effects of passive investment practices on the economy make ETFs a prime candidate for heightened consumer financial protection, regulatory action, and academic attention.
ii. Introduction

The 2008 global financial crisis (GFC) made Americans “deeply distrustful” of Wall Street. Most citizens have very little in common with a Wall Street firm. Yet since the GFC, a relatively new financial product—the Exchange Traded Fund (ETF)—has created a common bond between main street, institutional investors and major Wall Street firms. ETFs are investment products that trade on exchanges (like stocks) but “track an underlying index” or basket of assets (like securities, bonds or commodities). They give average investors low-cost instant diversification, in a single click of a mouse, with a product that can be bought or sold throughout the day on a national stock exchange like the NYSE. While mutual funds—perhaps the most important investment vehicle in the history of U.S. markets—also provide passive index and diversified asset exposure, ETFs are seen by many as superior since they offer secondary market, intra-day, trading at lower fees and tax advantages.

Given their numerous benefits, the post-GFC ETF market has experienced remarkable growth. Recent estimates peg the U.S. market at $3.4 trillion, up from pre-GFC levels of just over $500 billion. The menu of available ETFs have surged worldwide from 1622 in 2008 to 6478 in 2018.

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65 Id.
67 See infra Section II(iii).
and these products are expected to house a sizeable share of American retirement savings in the foreseeable future. 71 Also, ETFs are a preferred habitat for institutional investors, high-frequency trading programs (HF trading) and algorithmic wealth managers (robo-advisers). 72 And yet, ETFs present a potentially worrisome 73 paradox, and have polarized market participants. 74 On the one hand, they create the appearance of nearly perfect liquidity – the ability to buy or sell instantly with very low transaction costs. Yet, as this article will show, this liquidity could prove both illusory and fragile when it matters most, like during a stock market crash or a full-blown financial crisis, because it relies on the discretionary behaviors of intermediating financial institutions in a complex operational ecosystem. 75

In the U.S., ETFs lack a unified regulatory framework and naming convention (they’re often conflated with more complex 76 Exchange Traded Products (ETP)). 77 They’ve also stimulated a host of concerns about complexity,

71 See Su, supra note 69.
73 See Noah Smith, It’s Smart To Worry About ETFs, BLOOMBERG OPINION (June 5, 2017), https://www.bloomberg.com/opinion/articles/2017-06-05/it-s-smart-to-worry-about-etfs.
77 The discretionary, exemption-based, regulatory framework for ETFs has recently been described by Professors Henry T.C. Hu and John D. Morley as exhibiting a “cubbyhole problem.” See Henry T.C. Hu & John Morley, A Regulatory Framework, supra note 75 at 889 (the authors propose the first “unified” ETF regulatory framework for products that exhibit an “arbitrage mechanism” between a secondary and primary market). See also Hu & Morley, A Welcome Invitation, supra note 75 at 1159. The U.S. Securities & Exchange Commission has also recently provided for a simplified approval process for certain classifications of new ETFs.
opacity and contagion risk,\textsuperscript{78} counterparty and collateral risk for synthetic ETFs,\textsuperscript{79} and price and information inefficiency for underlying assets.\textsuperscript{80} They may also increase systemic risk since they extend the “financial intermediation chain”\textsuperscript{81} and behaved peculiarly during periods of market volatility in 2010, 2015, and 2018.\textsuperscript{82}

Another concern is “concentration risk” since three ETF sponsors - Blackrock, Vanguard and State Street - account for over 83% of the U.S. ETF market and these firms could become systemically important in the future.\textsuperscript{83} Equally concerning is the “shift to passive investing from active management” which has reduced a market “stabilizer”- active arbitragers who will mitigate a crisis by buying under-valued assets during a selloff.\textsuperscript{84} Evidencing this trend, passive investment vehicle ownership of U.S. equities will soon cross the 50 percent threshold\textsuperscript{85} and ETFs, as a growing significant portion of the passive index universe, could be facilitating more speculative market trading activity.\textsuperscript{86}

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Concerns have also been cited about potential conflicts of interest in ETF’s use of collateral, and leverage. An in-depth analysis of every ETF concern is beyond the scope of this article; however, they are worthy of individual academic consideration.

Ironically, one of the more important people in the creation of the ETF also became a strong critic -Vanguard’s late founder John Bogle. Prior to his death, Bogle worried about ETFs (and passive investing at large) creating a “tragedy of the commons” problem since what’s rational for individual investors (diversification, low fee investing) could weaken the market as a whole. Bogle also saw increased volatility and impaired price discovery through the decline of active investing (with less people wanting to “beat” the market, and more wanting to just “own” it) and noted the “momentum” effects of a market dominated by “trend traders” such as “algorithmic or programmatic trading systems” who could move in coordinated herds within the ETF ecosystem.

The Depository Trust & Clearing Corporation (America’s largest post-trade infrastructure provider) recently described growth, and liquidity uncertainties, in the ETF market as “two of the most significant post-crisis evolutions that could be potential sources of systemic market-related risks.” Yet the ETF market is understudied, and in a recent article proposing the U.S.’s first “unified” regulation framework for ETFs, Professors Henry T.C. Hu and

would have if they had invested directly in the underlying assets. Low transaction costs and their continuous trading may make ETFs (i) more liquid than the reference securities and (ii) more attractive than other types of CIS. ETFs can therefore attract short-term investors and high-frequency traders (HFTs) to a greater extent.”)

87 See Crisostomo & Medina, supra note 86 at 77-78.
88 Id. at 79.
90 David Thomas, A Warning From The Late John Bogle, FORBES (February 12, 2019), https://www.forbes.com/sites/greatspeculations/2019/02/12/a-warning-from-the-late-john-bogle/?bclid=IwAR2nJ2IQar12gi7zP5xLX3oALr5CwctcoR21ccSj7tgAMzrd46mRy5m9pQ#53d8f022b99. (“As with any tragedy of the commons, indexing is the sensible thing for each individual to do, but each individual should remember that many sensible ideas, especially in investing, make less sense as more people put them into practice. When the stock market turns down again, index fund owners will have to become their own active manager and make sure they’re well diversified, with limited exposure to risk, chaos, and catastrophe.”)
91 Id.
92 Id.
94 See DTCC supra note 75 at 13-14.
John D. Morley called the market a “regulatory and academic backwater”\(^{95}\) and noted “ETF regulation has also suffered from academic neglect.”\(^{96}\) As such there is very little legal writing directly in this area, \(^{97}\) and only a few articles tangentially address ETFs as part of larger concerns.\(^{98}\)

This two-part study investigates “interaction risks” in the ETF market. The first article (Part I) evaluates the potential for ETF “liquidity illusions” in a crisis. Part II will investigate other “interaction risks” as they manifest in investor herding and information inefficiencies. ETF liquidity in a sustained crisis is uncertain; however, the ETF industry maintains that these products (and their operating ecosystem) are stable,\(^{99}\) yet many commentators offer a contrary opinion.\(^{100}\) Liquidity in ETFs is dependent on the behavior of discretionary actors, which, in a crisis, can prove fragile, unpredictable and illusory.\(^{101}\) This

\(^{95}\) See Hu & Morley, A Regulatory Framework, supra note 75 at 844.

\(^{96}\) Id. at 847-848.


\(^{99}\) See infra Section IV(f).

\(^{100}\) See infra Section IV(a) – (e).

\(^{101}\) One of the most famous pronouncements of the fickle promise of liquidity was made by economist John Maynard Keynes when he remarked “of the maxims of orthodox finance, none, surely is more antisocial than the fetish of liquidity….It forgets that there is no such thing as liquidity of investment for the community as a whole.” (original source JOHN M. KEYNES, THE
The article will also use case studies on portfolio insurance in the 1980s, and the auction rate securities market in 2008, to show that in a crisis, arbitrageurs can be absent when they’re needed most, and that discretionary liquidity can also fail. The case studies highlight how Wall Street has a habit of creating investment products that, like ETFs, either promise perpetual liquidity, or combine leverage, complexity, and structural opacity to decrease financial stability. The question that lingers is whether ETFs are another iteration of this trend? It is impossible to predict how (or when) a new crisis will materialize, yet the popularity of ETFs as an asset class, how they increase the connection between main street and Wall Street, their potential risks, and the long-term economic uncertainty that passive investing is creating make ETFs a segment of consumer finance and financial regulation worthy of heightened attention.

The article will proceed by recounting the industry’s history; identifying ETF ecosystem’s operational mechanics and key participants. It introduces the concept of “liquidity illusions” and builds on prior analysis (like that of Professor Hu and Morley) that ETF liquidity is contingent on the discretionary actions of intermediaries, that such liquidity could prove fragile in a crisis. The liquidity illusion debate is polarizing - each side relying on assumptions about the behaviors of intermediaries under stress. Yet how these “ETF ecosystem” participants will act in a true sustained crisis is unknown.

The article provides a robust summary of the incentives and fragilities of participants in the ETF ecosystem, and a curated menu of contemporary empirical research and theoretical viewpoints on the liquidity illusion debate. It also documents the by-products of market complexity including the possibility...
of financial intermediary “rent-seeking” and other non-productive economic behaviors by market participants. This compliments previous work investigating the risks and impacts of economic “financialization.” Finally, it evaluates “supply-side” financial product innovation (new products that originate from financial intermediaries) against the idea that financial product innovation is driven by investor demand for more “complete markets,” and the allocation of financial risk to those most capable of bearing it.

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109 To highlight the debate of “supply” and “demand” side financial innovation compare and contrast Saule T. Omarova, New Tech v. New Deal: Fintech As A Systemic Phenomenon, 36(2) YALE JOURNAL ON REGULATION (2019, forthcoming) at 27, available https://ssrn.com/abstract=3224393 (for a discussion of supply side innovation) against Judge,
iii. The Exchange Traded Fund Ecosystem and the Value of Liquidity

This section introduces the liquidity illusion debate by describing how an ETF works; the intermediaries, their roles and incentives in the ETF ecosystem; and the history, and post-GFC demand drivers of ETF market growth. It also briefly introduces the concept of “liquidity” and describes why it’s so important in financial products.

a. Exchange Traded Funds: A Brief History

Although closed-end funds, and pooled investing, have their origins as far back as Dutch merchants in the late eighteenth century, the modern ETF first began trading on the Toronto Stock Exchange in 1990. The original American counterpart was launched by State Street Global Investors in 1993 under the ticker “SPDR” (popularly called the “spider”) and it tracked the S&P 500. The idea of index investing (the foundation of ETFs) emerged two decades earlier when index mutual funds were launched by Wells Fargo and the American National Bank and Vanguard founder John Bogle created the First Index Investment Trust (which like the SPDR also tracked the S&P 500). Also, in 1989, the American Stock Exchange and the Philadelphia Stock Exchange began trading Index Participation Shares (IPS) which were synthetic investment products (similar to futures contracts) that replicated the S&P 500 performance.
ETFs generally take one of two forms: a replication of a “physical” benchmark, or a “synthetic replication” using a derivative. 115 Physical replication is the most common structure in the U.S. 116 A physical replication can both “fully” represent an index or benchmark (by holding the exact same underlying securities), or provide a “sampling” (common for more illiquid underlying holdings). 117 A simple ETF (a “plain vanilla” physical replication structure) is created when an “authorized participant” (AP) 118 - a financial institution or market specialist - transfers, in kind, a basket of securities to an ETF plan sponsor (like BlackRock or Vanguard). 119 In exchange, the AP receives new ETF shares (called “creation units” - usually in blocks of 50,000 or more). 120 The ETF share basket is published daily by the ETF sponsor. 121 This is the “primary market”, where the total number of ETF shares is flexible, and retail investors do not transact. 122

Once in possession of new ETF shares, APs sell them to market makers (MM) and into exchanges (the “secondary market”) where they are traded by retail and institutional investors throughout the day. 123 It’s been estimated that 90 percent of daily trading activity in ETFs takes places in the secondary market. 124 Because ETFs trade on secondary markets (like stocks) they can be

115 See Deutsche Bundesbank ETF Report, supra note 104 at 83.
116 Id. at 84
117 Id. at 83.
119 See Rochelle Antoniewicz & Jane Heinrichs, The Role and Activities of Authorized Participants of Exchange Traded Funds, INVESTMENT COMPANY INSTITUTE REPORT (March 2015), 1, available at https://www.ici.org/pdf/ppr_15_aps_etfs.pdf (“In addition, APs are U.S. registered self-clearing broker-dealers that can process all required trade submission, clearance, and settlement transactions on their own account, as well as full participating members of the National Securities Clearing Corporation and Depository Trust Company.”)
120 See Su, supra note 69 at 4-5.
121 Id. at 5.
122 Id.
123 Id.
124 Blackrock, A Primer, supra note 118 at 7.
purchased through commissioned brokers, and also traded long or short, purchased with margin, and executed using a variety of order methods including limit, stop and market.\textsuperscript{125} Institutional clients can also trade them in \textit{alternative trading systems} and \textit{dark pools}, and they have become a preferred vehicle of HF trading and algorithmic trading programs.\textsuperscript{126}

Supply and demand for new ETF creations (or redemptions) originates in the secondary market, based on buy/sell order “imbalances.”\textsuperscript{127} APs are incentivized to transact with fund sponsors through arbitrage opportunities (explained below).\textsuperscript{128} APs may create ETF shares directly for institutional clients (for example in large ETF share blocks for an investor, like a pension fund, who delivers cash or securities, or a combination, directly to the AP to facilitate the creation).\textsuperscript{129}

ETF redemptions occur in a reverse process. ETF shares are purchased by APs from investors or MMs and then transferred to ETF plan sponsors in exchange for the basket of securities, or cash, if the ETF is cash redeemable.\textsuperscript{130} APs exclusively interact with the fund (the only participants in the ETF ecosystem to do so).\textsuperscript{131} This right is granted when an AP enters into an \textit{authorized participant agreement} (APA) with a fund sponsor, which endows a right (but not an obligation) for the AP to create or redeem shares in the primary market.\textsuperscript{132} The APA will either be “overarching” (allowing for primary market activity for any fund the sponsor offers) or limited to a particular fund series or trust.\textsuperscript{133} In this regard, APs have been described as a “provider of technology” in the ETF share creation and redemption process.\textsuperscript{134}

ETFs are different from mutual funds because of the “arbitrage mechanism” that exists between the primary and secondary market.\textsuperscript{135} Professors Henry T. C. Hu and John D. Morley (who have described the

\begin{footnotesize}
\begin{enumerate}
\item See BIS ETF Study, \textit{supra} note 75 at 2.
\item Blackrock, A Primer, \textit{supra} note 118 at 2; see also Hu & Morley, \textit{A Regulatory Framework, supra} note 75 at 852.
\item Blackrock, A Primer, \textit{supra} note 118 at 2
\item Id. at 3.
\item Id.; see also Hu & Morley, \textit{A Regulatory Framework, supra} note 75 at 852.
\item See Antoniewicz & Heinrichs, \textit{supra} note 119 at 1.
\item Id.; see also Hu & Morley, \textit{A Welcome Invitation, supra} note 75 at 1196-1197.
\item Antoniewicz & Heinrichs, \textit{supra} note 119 at 2.
\item See Blackrock, A Primer, \textit{supra} note 118 at 2.
\item See Hu & Morley, \textit{A Regulatory Framework, supra} note 75 at 843; see also Su, \textit{supra}, note 69 at 6;
\end{enumerate}
\end{footnotesize}
“arbitrage mechanism” in detail, and also recently proposed the first “comprehensive” regulatory framework for the U.S. ETF market) have called this dynamic a “novel, theory driven device” and also the “defining characteristic” of the ETF since “it is absent from the market microstructure of all other traded securities and from the ETF’s closest cousins, the mutual fund and the closed end fund.” The “arbitrage mechanism” is a way to ensure that ETF prices in the secondary market align with the net asset value (NAV) of the underlying basket of securities held by the fund sponsor. For example, if an ETF’s shares are trading in the secondary market, at a discount to its NAV then APs have an incentive to redeem the ETF shares for the more valuable basket of securities. Effective arbitrage (which relies on the voluntary actions of APs) is a fundamental regulatory consideration in the SEC’s ETF approval process.

c. Post-Crisis Growth in the ETF Market Size and Expanding Product Variety

Demand for ETFs, and the variety and complexity of available products, has grown dramatically over the past decade. An expanding number of institutional investors now hold ETFs. The limits of ETF product variety seem unbounded, and new products cover nearly every sector, with firms looking to replicate profit opportunities frequently copying new ideas. Recently ETFs have been created that follow (and track) newly financialized sectors, ideas, or strategies - for example there are ETFs on “women in leadership.” Product variety seems limited only by one’s imagination and extends beyond indices to

136 Hu & Morley, A Regulatory Framework, supra note 75 at 843-845.
137 See id. at 851. The NAV of an ETF is “generated at the end of the trading day.” See also Deutsche Bundesbank ETF Report, supra note 104 at 82; see also Hu & Morley, A Welcome Invitation, supra note 75 at 1158-1159
138 Hu & Morley, A Regulatory Framework, supra note 75 at 852.
140 See Vanguard, supra note 110.
142 See Hu & Morley, A Welcome Invitation, supra note 75 at 1157-1158.
144 See ETF DATABASE, Barclays Women In Leadership Total Return Index, http://etfdb.com/index/barclays-women-in-leadership-total-return-index/ (last visited June 1, 2019).
novel concepts like video-gaming and e-sports,\textsuperscript{145} consumer discretionary products,\textsuperscript{146} and commodity factoring.\textsuperscript{147} It also includes trading or operational strategies like leveraged products,\textsuperscript{148} synthetics,\textsuperscript{149} directional (inverse funds).\textsuperscript{150} As such, the number of available products have grown exponentially.\textsuperscript{151}

Some believe that “all new fund launches in 15 years” will be ETFs, thus effectively eliminating the mutual fund structure.\textsuperscript{152} A recent estimate suggests 61-times worldwide growth in ETPs (of which ETFs comprise the vast majority) since 2000.\textsuperscript{153} Bloomberg recently reported that the worldwide ETF market is worth over $5.3 trillion (up from $700 billion pre-GFC) with the U.S. accounting for nearly 70 percent of its size.\textsuperscript{154} The German Central Bank notes that as of mid-2018, the total capitalization of all worldwide investment funds was over $37 trillion (including mutual and other “open-end” fund structures, which

\textsuperscript{145} See Emily Zulz, VanEck Launches ETF Focused on Video Gaming, Esports: Portfolio Products, THINKADVISOR (October 22, 2018), https://www.thinkadvisor.com/2018/10/22/vaneck-launches-etal-focused-on-video-gaming-esport/.
\textsuperscript{151} Id.; see also U.S. SECURITIES AND EXCHANGE COMMISSION, REQUEST FOR COMMENT ON EXCHANGE-TRADED PRODUCTS, RELEASE NO.34-75165, FILE NO. 27-11-15 (November 27, 2015), 3 (“From 2006 to 2013, the total number of ETPs listed and traded as of year-end rose by an average of 160 per year, with a net increase of more than 200 in both 2007 and 2011. By comparison, from 1993 to 2005, the total number of ETPs listed and traded as of year end rose by an average of just 17 per year, with a net increase of 60 in 2000.”)
\textsuperscript{152} Yoosof Farah, Just How Dominant Will ETFs Be In 15 Years, CITYWIRE (Sept. 26, 2018), https://citywire.co.uk/wealth-manager/news/just-how-dominant-will-etfs-be-in-15-years/a1158758.
\textsuperscript{153} Su supra note 69 at 1.
\textsuperscript{154} See Evans & Wilson, supra note 63.
comprise the largest share). Given their popularity, and post-GFC rapid growth, ETFs are an important market segment for closer scrutiny.

The fuel for ETF growth is diverse. They have lower fees, secondary market intra-day trading, the potential for short and margin trades (with enhanced liquidity over mutual funds), instant diversification, “operational simplicity” and tax advantages. Thus they are largely an upgrade from mutual funds. Perhaps most compelling is that net of fees, and over a ten-year time period, passive funds routinely outperform actively managed funds.

It’s been suggested that post-GFC regulatory requirements for banks to “shed large inventories to bolster their balance sheets” has contributed to market growth, as well as the ability to execute (with low costs) hedge or speculative trades - including exposure to illiquid underlying assets. Also contributing to growth is the “viral” replication potential for profitable structures. ETFs can also act as an “alternative to futures” while generating similar benefits, and provide low-cost access to otherwise thin, or illiquid, markets such as commodities.

155 See Deutsche Bundesbank ETF Report, supra note 104 at 80.
156 See id (“However, its growth momentum has been particularly pronounced in recent years. For instance, ETFs accounted for a mere US$0.7 trillion (5.4%) of the assets managed by all types of investment funds back in early 2009. Since then, its share of all fund products has increased significantly, which is attributable to considerably higher growth rates for ETFs compared to those for open-end investment funds (and other investment funds) over the past few years.”)
158 See Judge, Investor-Driven, supra note 37 at 328.
160 Id. at 5.
164 See Evans & Wilson, supra note 63.
precious metals and higher-yield fixed income products, as well as inverse and leveraged exposure.\textsuperscript{167}

d. Why Liquidity Matters in Investment Products

Liquidity costs are often both “underestimated” \textsuperscript{168} and “under-appreciated.” \textsuperscript{169} Liquidity captures the “ease” at which an asset can be “converted” into cash and thereby facilitate a “consumption” activity. \textsuperscript{170} Importantly, liquidity measures the extent that a security can be traded without affecting its price. \textsuperscript{171}

Liquidity in ETFs is relevant at the secondary market level (often called “displayed liquidity”), MM inventory level (non-displayed secondary market liquidity), the ETF primary market (APs transacting with ETF sponsors through redemptions and creations) and liquidity in the actual underlying assets. \textsuperscript{172} The “bid-ask spread” has been described as a “simple measure of market liquidity.” \textsuperscript{173} Recent empirical studies undertaken by the Central Bank of Germany have noted tighter bid-asks for ETFs (over their underlying securities) for certain market segments (like widely held equities) – suggesting that ETFs are “more liquid” than their underlying holdings. \textsuperscript{174} This was not the case, however, for ETFs holding certain fixed income products and bonds. \textsuperscript{175}

As witnessed in the GFC, liquidity shortages can be devastating. \textsuperscript{176} The “riskiness” of an ETF is not just the economic risk associated with the underlying assets, but also liquidity risk from the interactions of intermediaries within the

\textsuperscript{167} See id. at 112-114.  
\textsuperscript{168} See Dean Stewart, The value of liquidity, implications for global debt instruments, MACQUARIE INVESTMENT PERSPECTIVES (August 2014) 2, see also at 5 (“Because liquidity is highly skewed, liquidity costs at any point in time other than during a crisis are likely to be lower than long term averages. This will bias investors to underestimate liquidity costs.”)  
\textsuperscript{169} Id. at 6 (“Investors usually carefully analyze the credit quality of their portfolio, but usually pay less attention to the liquidity of their portfolio, or the liquidity management credentials of their managers. If anything, it should be the other way around.”)  
\textsuperscript{170} Aleksander Berentsen, Samuel Huber & Alessandro Marchesiani, Free-riding on Liquidity, UNIVERSITY OF ZURICH WORKING PAPER NO. 32 (September 2011), 2.  
\textsuperscript{171} See INVESTOPEDIA, Liquidity, https://www.investopedia.com/terms/l/liquidity.asp (last June 14, 2019).  
\textsuperscript{172} See Su, supra note 69 at 4-5.  
\textsuperscript{173} See Deutsche Bundesbank ETF Report, supra note 104 at 89-91.  
\textsuperscript{174} Id.  
\textsuperscript{175} Id. at 90.  
\textsuperscript{176} See Su, supra note 69 at 4-5.
ETF trading ecosystem. It is impossible to predict the next crisis, but liquidity shortages in the ETF market could magnify a crisis fallout. Liquidity is also important for investors who don’t have the resources to otherwise “absorb sudden shocks” in the context of flash crashes or investor herds.

**iv. Do ETFs Create Liquidity Illusions?**

This section will introduce the notion of ETF “liquidity illusions.” It will illustrate how a breakdown in ETF arbitrage could create a scenario where liquidity in the ETF market proves to be illusory (or at least very costly) when it’s needed most during a crisis. It will also show how fears of liquidity illusions are primarily, but not exclusively, in fixed-income ETFs. The section also identifies the industry-advocated pro-liquidity counter arguments to round out the debate. Finally, it canvasses the impact of algorithmic trading programs and HF trading on liquidity illusions.

**a. Liquidity Illusions and the ETF Arbitrage Function**

The foundational fear behind the liquidity “illusion” concern is that ETF shares aren’t as liquid as they are purported to be. In a crisis scenario, a lack of liquidity in ETFs could foster “pro-cyclical” developments like investor herding, cascades and contagion selling in ETF’s underlying securities and across other asset classes. These concerns have been identified recently in a variety of reports including by the International Monetary Fund (IMF), the Financial Stability Board (FSB), and the Central Bank of Germany (Deutsche Bundesbank).

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177 Id.
180 See Deutsche Bundesbank ETF Report, supra note 104 at 93-97.
183 See Deutsche Bundesbank ETF Report, supra note 104.
Liquidity illusion concerns emanate from uncertainties about how ETF ecosystem participants – particularly APs and MMs – will act in a crisis.\(^{184}\) There is also a “spill over” worry that liquidity shortages in ETFs could lead to panicked selling in other asset classes, as investors who can’t sell their ETF shares (or can only sell them at steep discounts) will spread the “liquidity pressure” in a cascading selloff of other investments.\(^{185}\) This could generate what’s been described as a “feedback loop” as coordinated selling drives prices downward in both the ETF secondary and underlying asset markets.\(^{186}\)

These concerns are based on a belief that the ETF arbitrage function wasn’t “designed for a large market sell-off.”\(^{187}\) It’s been reported that some hedge funds have been “borrowing shares and stockpiling bearish options” under a theory that ETFs (especially fixed income) are a “ticking time bomb.”\(^{188}\) The theory is that APs in an underlying asset sell-off won’t want to redeem ETF shares and receive, in-kind, illiquid (and quickly devaluing) securities, so they will simply withdraw from the primary market redemption process altogether – thus creating an ETF “death spiral” since healthy portions of the fund will be liquidated and only “distressed and illiquid notes” remain.\(^{189}\) Such a scenario could also lead to a liquidity shortage and a corresponding ETF share fire sale in the secondary market.\(^{190}\)

Some fear that this could also generate a “self-fulfilling prophesy” if enough investors believed an AP withdraw was inevitable and collectively shorted the ETFs.\(^{191}\) Also MMs and APs may widen their bid-ask spreads as


\(^{185}\) Id.

\(^{186}\) See Ian Foucher & Kyle Gray, *Exchange-Traded Funds: Evolution of Benefits, Vulnerabilities and Risks*, BANK OF CANADA FINANCIAL SYSTEM REVIEW (December 2014), 42 (“APs can also transmit liquidity shocks from the ETF to the underlying assets (and vice versa). As ETFs and the underlying market become more interconnected, a small liquidity shock originating in either the ETF or the underlying securities could be amplified through a feedback loop (via APs). This could result in a large liquidity shock and a reduction in price informativeness for both the ETF and the underlying market.”)


\(^{188}\) Id.

\(^{189}\) Id.

\(^{190}\) Id.

compensation for the enhanced volatility “pricing error.” In anticipation of liquidity shortages other fund managers have started devising option strategies to profit from flash crashes.

If APs completely withdraw from the market, ETFs would trade like closed-end funds, and the spread between ETF share prices and their NAV would widen. Secondary market liquidity providers (like high frequency traders (HF traders)) could back out of the market, leaving ETF investors with illiquid securities. HF Traders and other short-term ETF sellers would likely be the largest (and fastest) participants to liquidate their initial positions, leaving less sophisticated investors exposed to significant losses.

This is the essence of the “illusion” of liquidity when ETFs are comprised of illiquid underlying securities. Liquidity in a ETF that holds illiquid assets is contingent on an “intervening mechanism that allows participants to arb away disconnects.” The problem is that the arbitrage function for ETFs could be fragile since it is discretionary, driven by market incentives, and as Part V will show discretionary liquidity, and reliance on arbitrageurs, can prove fragile in a crisis.

b. Fixed Income ETFs: The Center of The Liquidity Illusion Controversy

199 See Infra, Section IV.
These warning calls resound most loudly in the fixed income and loan ETF markets (although the issue of liquidity “mismatch” has also been cited as a concern by the Bank for International Settlements in “emerging market equities” as well). 200 Fixed income ETFs have experienced significant post-crisis growth driven by yield-seeking investors wanting exposure to otherwise illiquid, and over-the-counter traded, loans and fixed income products, and institutions who use these products as cash substitutes. 201 The market could grow even larger as BlackRock has signaled that mortgage backed securities (MBS) are “ripe for transformation” into an ETF structure. 202 Recent reports estimate that the value of the bond ETF market is “on track” to surpass $1 trillion by the end of 2019. 203

The main ETFs of concern for liquidity illusions are corporate and high yield bond funds 204 given the increasing size, institutional exposure, the “challenges in trading, liquidity and security sourcing” of individual bonds, and the fact that fixed income ETFs are seen as a “frictionless” substitute for otherwise illiquid fixed income products. 205 A sustained low interest rate environment has facilitated a “surge” in post-GFC corporate debt with recent reports estimating the market at over $9 trillion (64 percent higher than 2009). 206 Correspondingly, the fixed income ETF market has exploded with over $97

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200 See BIS ETF Study, supra note 75 at 1.
203 See Bailey McCann, Bond ETFs are On Track To Reach $1 Trillion Mark By End of the Year, THE WALL STREET JOURNAL (May 1, 2019), https://www.wsj.com/articles/bond-etrfs-are-on-track-to-reach-1-trillion-mark-by-the-end-of-the-year-11556726577/.
206 See Jeff Cox, Gundlach’s warning on ‘ocean of debt’ adds to worries over corporate bonds, CNBC (January 14, 2019), https://www.cnbc.com/2019/01/14/gundlachs-warning-on-ocean-of-debt-adds-to-worries-over-corporate-bonds.html.
billion in new assets in 2018. This concern has also been recently noted for ETFs that invest in leveraged loans and mortgages.

Fixed income ETFs allow for instant access to a market that is otherwise difficult to obtain exposure. They are “attractive to retail investors” because of the secondary market liquidity for a generally illiquid underlying asset class. It also triggers a risk of a “negative feedback loop” as previously described. The idea of transforming something that’s fundamentally “illiquid” (like a mortgage) into something “liquid” (an ETF that holds mortgage securities) evokes a liquidity “mismatch” and “illusion” concern (reminiscent of mortgage backed securities in the GFC). Said one market participant in a recent Barron’s interview, “[i]n 2007, the lie was that you could take a cornucopia of crap, package it together, and somehow make it AAA. This time, the lie is that you can take a bunch of bonds that trade by appointment, lump them together in an ETF, and magically make them liquid.”

ETF liquidity is reliant on MMs and APs who have market-based incentives and are not contractually obligated to provide liquidity. The APAs that APs enter into with ETF sponsors don’t provide compensation to the AP

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209 See Chris Flood, ‘Big Ticket’ Trades Made Possible By Bond ETF Liquidity, FINANCIAL TIMES (June 17, 2018), https://www.ft.com/content/b5e0bb88-5865-11e8-806a-808d194fb75.
211 Id. See also Levine, supra note 202 (“ETFs, like stocks, can be bought and sold in milliseconds. But bank loans cannot. Loans trade in over-the-counter markets with much less volume and settlement times that can stretch out a month. The worry is that investors will stampede out of loan ETFs, which account for about $10 billion of the $156 billion in loan fund investments, faster than the ETF managers can sell the underlying loans in their portfolio. This would cause a gap in the value of the ETF and the value of the loans in it, or worse, the possibility the funds may not be able to immediately come up with money for investors looking to cash out.”)
212 Id.
214 For an example of an APA see FORM OF PROSHARES TRUST II AUTHORIZED PARTICIPANT AGREEMENT, available at https://www.sec.gov/Archives/edgar/data/1415311/000119312508213746/dex43.htm.
directly.\textsuperscript{215} APs profit by either acting as dealers or MMs in the secondary market (earning the bid-ask spread and also profiting off arbitrage opportunities), or taking fees as “clearing brokers” where they are paid for “processing creations and redemptions as agents for various market participants” like investment advisers and liquidity providers such as MMs, hedge funds, and “proprietary trading firms.”\textsuperscript{216} Most importantly, an AP does not have a legal (or fiduciary) obligation to create or redeem ETF shares\textsuperscript{217}, and an individual ETF sponsor will enter into many APAs with various APs with large funds having the most agreements in place.\textsuperscript{218}

c. Liquidity Wrappers and Market Completion Theory

Liquidity in the ETF secondary market is considered “additive” or an “enhancement”\textsuperscript{219} since it doesn’t require trading in the underlying securities.\textsuperscript{220} It is essentially a “liquidity wrapper” for otherwise illiquid underlying.\textsuperscript{221} This paints ETFs as a favorable by-product of financial innovation, driven in response to “market imperfections.”\textsuperscript{222} Another view of financial innovation is that it originates from financial intermediaries seeking to capture profits by converting risky claims into “safe assets.”\textsuperscript{223} This is commonly called the “supply-side” financial innovation.\textsuperscript{224} Concerning the latter, Hyman Minsky’s “financial instability hypothesis” whereby financial


\textsuperscript{216} See Antoniewicz & Heinrichs, supra note 119 at 1.

\textsuperscript{217} See Hu & Morley, A Regulatory Framework, supra note 75 at 853; see also Hu & Morley, A Welcome Invitation, supra note 75 at 1196.

\textsuperscript{218} See Antoniewicz & Heinrichs, supra note 119 at 2-4.


\textsuperscript{220} See Su, supra note 69 at 6.

\textsuperscript{221} Id. at 10.


\textsuperscript{223} See Anna Gelpern & Erik F. Gerding, Inside Safe Assets, 33 YALE J. ON REG. 363, 363. (2016). The concept of “safe assets” has been reviewed in depth by Professors Anna Gelpern and Erik F. Gerding and is a “catch-all term to describe financial contracts that market participants treat as if they were risk free. These may include government debt, bank deposits, and asset-backed securities, among others.” The Professors argue that despite these asset’s perception as “safe” there are “embedded” sources of “instability” and “distortion” because of the “legal architecture” and “political commitments” inherent in these assets (see discussion at 406-411). As a result, they argue there is “no such thing as a risk-free financial contract” and it is only the intervention of the state that allows people to act as if these assets are truly “safe” (see discussion at 365, 420).

\textsuperscript{224} See Awrey, Toward A Supply Side, supra note 108.
firms use innovation to pursue profit opportunities has gained prominence post-GFC. In Minsky’s model, financial innovation is a product of “profit seeking activity” by financial institutions, and over extended periods of economic tranquility markets endogenously de-stabilize.

Liquidity enhancement as a justification for financial innovation is derived from the “market completion theory” (MCT). Under this theory, economic risk is managed through the creation of financial products that are optimally distributed to capable risk bearers. Professor Anastasia Nesvetailova has argued that the GFC fostered MCT-based “liquidity illusions” and these drove investor behavior and contributed to the crisis beyond the “structural” and “cyclical” economic causes commonly cited. Relying on Minsky she posits that liquidity is contingent on the characteristics of tradeable assets, not MCT from financial innovation. Her assertions rely on Minsky’s idea that economic tranquility facilitates instability by fostering a “complex hierarchy of financial commitments” and that periods of prosperity create an “underestimation of risks” when creating and trading financial products including liquidity that is “assumed but never guaranteed” like during the GFC in mortgage-backed securities.

The seemingly endless possibilities of ETF innovation cause one to wonder whether markets will ever be fully “complete.” A recent study by Professors Kevin Pan and Yao Zeng casts additional doubt on ETFs as a demand-
side “market completion” proposition, since the “liquidity mismatch” dynamic can lead to “persistent relative mispricing and potential market fragility” between ETFs and underlying bonds when financial intermediaries act in “dual roles” as both bond dealers and ETF arbitrageurs. The study notes, “AP arbitrage indeed becomes less effective or even fragile when liquidity mismatch becomes more significant.” Further, when acting in dual roles, ETF arbitragers can use primary market redemptions and creations to “unwind their bond inventory imbalances.”

The intermediation layers in the ETF ecosystem (specifically the ETF arbitrage process) may be adding new inefficiencies (relative mispricing, reduced liquidity, market fragility) and also generating conflicts of interest for ecosystem participants to potentially withdraw from arbitrage activities. The exercise of strategic discretion, and resulting inefficiencies, by APs (who also hold and trade the underlying asset) in a conflict scenario is very important to consider when critically assessing the value-add of liquidity wrappers under a market completion theory. Further, when an AP is also acting as both a dealer / market maker and an arbitrageur, during a time of crisis, there is an inherent conflict which could lead to MMs “front running” their own trades.

236 See Kevin Pan and Yao Zeng, ETF Arbitrage Under Liquidity Mismatch, FOURTH ANNUAL CONFERENCE ON FINANCIAL MARKET REGULATION (June 28, 2017) at 2, available at https://ssrn.com/abstract=2895478 or http://dx.doi.org/10.2139/ssrn.2895478; see also Hu & Morley, A Commendable Start, supra note 75 at 1196-1197.
237 Pan & Zeng, supra note 236 at 50.
238 Id.
239 See id. discussion at 2.
240 See id. discussion at 3 (“ETF arbitrage may go in the opposite direction than what would be implied by the initial relative mispricing. Specifically, APs may choose to create (re redeem) more ETF shares where they have extremely positive (negative) bond inventory imbalances, regardless of the initial price discrepancy. Surprisingly, the model suggests that APs do even more ETF creations and redemptions when bond volatility increases or as the market becomes more illiquid. Intuitively, APs strategically use ETF creations and redemptions not to correct relative mispricings but to unwind bond imbalances, reduce existing inventory risks and facilitate future market-making in their role as bond dealers. In this sense the ETF arbitrage mechanism becomes distorted - creations and redemptions are disconnected from fundamentals (and/or arbitrage opportunities) and gives rise to the possibility of larger relative mispricings. More precisely, the ETF arbitrage is distorted not because APs fail to fully optimize. Instead, APs do optimize, choosing to use creations and redemptions strategically on account of their existing illiquid bond inventory imbalances, thereby potentially violating the designed intention of the ETF arbitrage mechanism.”); see also Hu & Morley, A Commendable Start, supra note 75 at 1196.
241 See Su, supra note 69 at 22; see also Hu & Morley, A Welcome Invitation, supra note 75 at 1195-1196 (“Some APs also act as registered market makers, who assume a two-sided obligation to buy and sell ETF shares on a particular exchange. The effectiveness of the arbitrage mechanism in narrowing deviations from NAV depends on such purely voluntary decisions of APs, as well as the activities of market makers and others in the secondary market.”).
A May 2019 research report by Moody’s Investor Service stressed how important MMs were to ETF investors in providing liquidity in the ETF ecosystem. The report notes, “tech-enabled trading firms dominate the ETF market making space” and that if these firms “stepped away” from the market making environment it could “amplify” systemic risk. This will also have a particularly perilous effect on investors who embrace the liquidity wrapper theory that “believe an ETF is more liquid than its holdings.”

Given the potential conflicts of interest and systemic risks, emanating from their role as intermediary in the ETF ecosystem, is it natural to wonder whether some type of duty of “redemption” or positive obligation to provide liquidity support should be imposed on APs and other large MMs? The subject of MM fiduciary duty will be explored in the next subsection; however, this inquiry is one for regulators to be mindful of as the market grows, and alarm bells continue to sound (like the Moody’s report) about just how important the APs and MMs are to secondary market ETF investors.

Investors in ordinary mutual funds can redeem their shares directly with the fund at “net asset value” (NAV) pursuant to sections 2(a)(32) and 5(a)(1) the Investment Company Act governing “open-end management investment companies.” Money-money mutual funds (MMMF) historically were redeemable at a “stable” NAV ($1.00 per share); however, post-GFC rules designed to mitigate MMMF runs have introduced new “floating NAV” rules that reflect underlying securities daily prices (rather than a $1.00 “stable price”) on MMMFs that invest in corporate debt.

ETF shareholders in the secondary market can’t transact directly with the ETF fund sponsor to redeem their shares at the underlying NAV. This is only

244 Evans, supra note 243.
247 See Kuhu Parasrampuria, SEC’s New Money Market Rules, 36 REV. BANKING & FIN. L. 2, 2-3 (2016) (in addition to the “floating NAV” the reforms “also impose fees and redemption gates, which temporarily prohibit investors from withdrawing their investments in MMFs.”)
done by a small number of “designated APs” who redeem ETF shares in “large blocks” and are incentivized through the arbitrage function to eliminate price differences in the ETF secondary market and the underlying NAV.\textsuperscript{248} It is uncertain whether imposing a duty on these designated APs to provide liquidity support (akin to a redemption right in ordinary mutual funds or MMMFs) in the secondary market, under certain circumstances, is warranted.\textsuperscript{249} Also, as noted by Hu and Morley, it is a “complex question” to consider whether APs should have a duty to perform the arbitrage function.\textsuperscript{250}

d. Discretionary Market Makers or Noise Traders? Algorithmic & High Frequency Trading

The case for ETF liquidity illusions being overblown (or even non-existent) rests on the assumption that MMs and APs will step up in a crisis and provide liquidity support. The incentives for MMs and APs to provide liquidity support are market-based, and they come primarily in the form of capturing bid-ask spreads and receiving “liquidity rebates” from exchanges.\textsuperscript{251} MMs in the ETF market primarily use a “maker-taker” compensation model (where liquidity providers are compensated and liquidity “takers” (often hedge funds or other large block sellers) are charged for reducing it.\textsuperscript{252} Maker rebates are “enhanced” for lead market makers (LMM) who take on additional quoting obligations.\textsuperscript{253}

MMs provide secondary market liquidity to ETF investors through conventional trades like “limit orders” or for larger, more sophisticated, investors through “step away” trading off-exchange.\textsuperscript{254} The NYSE ARCA is the

\textsuperscript{248} See Hu & Morley, A Regulatory Framework, supra note 75 at 873.
\textsuperscript{249} See CBI Discussion Paper, supra note 75.
\textsuperscript{250} See Hu & Morley, supra note 75 at 1194-1195.
top U.S. exchange for ETF trading with over 22% market share in U.S. trading volume.\textsuperscript{255} ETFs also trade on Alternative Trading Systems (ATS), although at a reduced volume.\textsuperscript{256}

The MM industry has experienced some strain in recent years,\textsuperscript{257} and a digital-reiteration driven by the emergence of HF trading algorithms (often called “informal liquidity providers.”)\textsuperscript{258} HF trading is a major player in providing liquidity in ETFs.\textsuperscript{259} The rise of HF trading as a primary market maker, and the death of the human exchange “specialist” has been lamented as facilitating “duty free liquidity” where HF trading incurs benefits but not obligations since they “only provide liquidity when the algorithms that they employ determine that the risk reward ratio is tipped in their favor.”\textsuperscript{260}

The robustness of ETF liquidity provision by HFT in a crisis is uncertain.\textsuperscript{261} We don’t know exactly how HF traders will interact with other MMs in a prolonged ETF liquidity crisis, and the associated costs (particularly imposed on traditional liquidity providers who may be trading on “long-term information”).\textsuperscript{262} HF trading has been criticized as disrupting the price discovery function\textsuperscript{263} and reducing the incentives of informed traders because of their

\begin{footnotesize}
\begin{enumerate}[<255>]
\item Id. at 659.
\item See Dolgopolov, Regulating, supra note 257 at 699.
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\end{footnotesize}
ability to co-locate, subscribe to market data-feeds, and obtain “early access to inside information and trading data.” The primary concern of HF trading as a liquidity provider (particularly in the ETF market) is whether, as the SEC has inquired, they provide “phantom liquidity that disappears when it is most needed by long term investors and other market participants.”

Professor Stanislav Dolgopolov has noted that Federal courts have not historically imposed broad fiduciary requirements on MMs to provide liquidity to individual investors. MMs could also play “multiple roles” - in addition to acting as principal on their own account, they may also act as underwriter, agent or broker-dealer. Dolgopolov states that in some cases dealing with multiple roles, as well as “personalized relationships and relatively illiquid / custom-made securities traded in an informal market,” an increased duty on MMs has been found by federal courts. MM’s are not immune to private rights of action – a factor that supports their stepping up to provide liquidity to the ETF market in a time of crisis.

Yet MMs are also continually exposed to the risk of “pick off” – in other words the risk of “entering into an unfavorable transaction with a counterparty with superior information” although this risk is mitigated by the micro-time horizons associated with HF trading. An MM will only provide liquidity if it’s in their economic best interest to do so, and a potential concern is that, even if MMs stay in a crisis scenario they may trade at “inflated” or “grossly

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266 Dolgopolov Two-Sided, supra note 251 at 35-36.
267 Id. at 63.
269 See Dolgopolov, Regulating, supra note 257 at 677.
270 Id. at 679.
exaggerated prices” – similar to what happened in equity index options on “Black Monday” (October 19, 1987).

A recent study showed, using a “rational expectations equilibrium model”\(^\text{272}\) that discretionary liquidity traders – like HF traders – increase the amount of “noise trading” (trading with no valuable informational content in valuing the asset).\(^\text{274}\) This causes price inefficiency and a loss of “information aggregation.”\(^\text{275}\) These distortions are exacerbated by “public information” (like enhanced disclosures), that while initially increasing liquidity, attracts more uninformed (noise) traders into the market and acts to “crowd out” valuable private information.\(^\text{276}\) Price or “market” efficiency is the notion that all “information that is relevant to the asset’s fundamental value” (including its liquidity risk) is transmitted through its price.\(^\text{277}\) Thus as HF trading grows to dominate ETF liquidity provision one must naturally question the efficacy of ETF prices as a conveyor of full information including risk.\(^\text{278}\) Further, there is evidence that HF traders and other “algorithmic traders” use trading strategies that are “highly correlated.”\(^\text{279}\) Therefore, HF trading MMs in ETFs could generate herding risk, an “interaction risk” fully explored in Part II of this article.

\section*{e. Liquidity Shortages and Market Maker Ecosystem Participant Concentration}

\footnotesize{\textsuperscript{272} Dolgopolov Two-Sided, supra note 251 at 35-36.  
\textsuperscript{273} Bing Han, Ya Tang, & Liyan Yang, Public Information and Uninformed Trading: Implications for Market Liquidity and Price Efficiency, 163 JOURNAL OF ECONOMIC THEORY 604, 605 (2016) (“Rational expectations equilibrium (REE) models have been the workbench for analyzing financial markets by providing a machinery of Hayek’s (1945) idea that prices aggregate information dispersed among market participants. These models typically introduce “noise trading” or “liquidity trading” to prevent the market price from fully revealing private information and to circumvent the “no trade” problem.”)  
\textsuperscript{274} Id. at 605.  
\textsuperscript{275} See id.  
\textsuperscript{276} Id. at 606.  
\textsuperscript{277} Id.  
\textsuperscript{278} See id. (“More public information reduces information asymmetry and adverse selection; thus, for a given amount of noise trading, it improves market liquidity. In turn, better liquidity lowers the expected loss of discretionary noise traders thereby attracting more such traders to the market, leading to more non-informational trading in the market. Hence, the information asymmetry problem weakens, which further improves market liquidity. As a result, both the equilibrium amount of aggregate noise trading and market liquidity increase with the precision of the public signal. Since noise traders are uninformed, increased noise trading negatively impacts the effectiveness of asset price in aggregating speculators’ private information, which implies that disclosure negatively affects price efficiency.”)  
Another identified problem in the modern ETF MM ecosystem is market concentration. It’s been recently estimated that “[e]ighty seven percent of all allocated ETFs on the New York Stock Exchange are spread out among only five different market making firms.”\textsuperscript{280} Therefore a “strategic exit” or rogue behavior by a dominant MM in the ETF market could cause significant disruption.\textsuperscript{281}

Another concern is that APs perform a “dual role” of both primary market redemption / creation of ETF shares and secondary market MM, and an AP withdrawal in a crisis eliminates both functions.\textsuperscript{282} APs frequently trade in the primary market with many different funds, and their active participation is of “critical significance” to the market at large.\textsuperscript{283} It’s been estimated by the \textit{Bank of France} that the number of APs for a given fund is often five or less and this reinforces just how important their intermediating role is, and the concerns relating to market concentration.\textsuperscript{284}

Liquidity shortages via “concentration risk” is relevant to consider for APs, MM who aren’t APs (providing addition secondary market liquidity) and ETF fund sponsors and the concern is that an “idiosyncratic event” at a prominent ETF ecosystem intermediary could trigger a contagion across the market.\textsuperscript{285} Related is the liquidity concern of “true float” (the actual shares available to be traded) of underlying assets as passive ETF funds (and ecosystem participants who both trade and manage them) continue to grow in size.\textsuperscript{286}

\textbf{f. The ETF “Pro-Liquidity” Industry Counter-Arguments}

ETF liquidity illusions are hotly contested, and far from a settled proposition.\textsuperscript{287} Industry participants say they trust the market, and also that other

\textsuperscript{280} Bak, supra note 253.
\textsuperscript{281} Id.
\textsuperscript{282} See Deutsche Bundesbank ETF Report, supra note 104 at 93; see also Hu & Morley, A Commendable Start, supra note 75 at 1196.
\textsuperscript{283} Id. at 94.
\textsuperscript{284} See Deutsche Bundesbank ETF Report, supra note 104 at 93. see also G. Turner & V. Sushko, \textit{What risks do exchange-traded funds pose}, \textit{BANQUE DE FRANCE, FINANCIAL STABILITY REVIEW}, No 22 (April 2018).
\textsuperscript{286} 13D Research, \textit{id}.
APs will replace those who withdraw during a crisis. BlackRock (who clearly benefits from a stable market perception), is adamant that these purported risks are overblown – even non-existent. Liquidity illusions have also been identified as potentially forming in equity ETFs and Societe Generale SA recently disclosed results from a liquidity fragility stress test of 16,000 stocks, suggesting several ETFs were exposed to secondary market liquidity risks given their large holdings of particularly vulnerable equities.

BlackRock refutes these studies, stating that they use assumptions not indicative of “historic behavior of investors or ETFs.” They also suggest that widespread AP pullout is highly unlikely because other APs would scoop up the arbitrage opportunity for profit. This trust in APs to step in and mitigate a liquidity crisis has been cited by other industry participants.

Further, the underlying bond portfolios of fixed income ETFs are becoming increasingly “standardized” which serves as an additional safeguard.

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289 See BLACKROCK VIEWPOINT, February 2018 Case Study: ETF Trading In A High Velocity Market, March 2018, at 3 (hereinafter “BlackRock ETF Case Study”); see also BlackRock, Index Investing, supra note 159.
292 Id.
293 See BLACKROCK ETF Case Study, supra note 289 at 5-6.
296 See BLACKROCK ETF Case Study, supra note 289 at 1, 6.
297 See Friesen, supra note 219.
The Financial Stability Board has noted that, in a crisis, ETF sponsors could rely on credit lines and use cash to cover redemptions until the panic had subsided. Most ETFs, however, are not cash redeemable, but rather transfer the underlying securities “in-kind” to the AP, and using leverage to subside a panic is a risky proposition. It is also possible (but easy to doubt) that investors can self-manage risk exposures by closely scrutinizing the liquidity of the underlying securities prior to investing in an ETF. A recent survey undertaken by the International Organization of Securities Commissions (“IOSCO”) suggests that industry participants generally consider ETFs to be safer than mutual funds because of secondary market trading and the in-kind redemption mechanism, and that “the best line of defense against a liquidity mismatch” is with the ETF itself to establish prudent liquidity management tools and practices.

Another point of view in support of ETFs providing an “additional layer of liquidity” is that in some cases the “underlying assets” are only lightly traded, or don’t trade at all. In this case “price” is not the trading signal but rather the “value” of the underlying assets, and the additional layer of liquidity, provided through ETF secondary market trading, performs a price discovery function.


300 See Bird, supra note 194.


303 Id. at 23.

(making an ETF a superior investment vehicle for illiquid underlying). For example, in 2015 the stock market in Greece closed for 5 weeks due to political and regional uncertainty, and when it re-opened the market fell 23 percent. During this time, however, an ETF (Global X’s GREK ETF) tracked the market and stock prices when the market re-opened were in line with the ETF prices.

Also, in regards to the fixed income market, one portfolio manager has argued that bond ETFs are safer than bond mutual funds because “[i]f liquidity of the underlying asset class was a concern and you wished to exit a traditional bond fund, your redemption would be at the discretion of the fund provider and in extremis, you may find yourself gated.” With an ETF you can at least sell on the secondary market and you aren’t stuck to only dealing with the fund issuer. Further, the “gradual electronification of fixed-income trading” has been cited as a factor that will improve the liquidity in both bonds and fixed income ETFs reducing the liquidity illusion risks.

v. Case Studies: Absent Arbitrageurs and Discretionary Liquidity Failure

History has a habit of repeating itself, and as philosopher George Santayana famously remarked, “those who cannot remember the past are condemned to repeat it.” Two financial market episodes from the relatively recent past are worthy of investigation when assessing interaction effects, liquidity illusions, and reliance on discretionary actors in ETFs. These are the impact of “portfolio insurance” products during the “Black Monday” crash of October 1987, and the “auction rate securities” market failure in the GFC. Several parallels can be drawn between these two episodes and growing concerns in the ETF market, of which two are most relevant: arbitrageurs aren’t always there when you need them; and discretionary liquidity is fragile in a crisis because intermediaries can simply back away and stop providing it.

305 Id.
306 Id.
307 Id.
309 Id.
310 Evans, supra note 183.
Monday, October 19, 1987 - known to market historians as the infamous “Black Monday” crash - saw the Dow Jones Industrial Average (“DJIA”) lose over 20 percent of its value (the largest single day decline in U.S. history). Various theories have attempted to explain what caused Black Monday including the impact of “globalization.” The Federal Reserve Bank of Chicago stated that “international investors had become increasingly active in US markets, accounting for some of the rapid pre-crisis appreciation in stock prices.” Other theories include a record number of “margin calls” as well as “problems in trading systems” and “difficulty in gathering information in the rapidly changing and chaotic environment.” In the seven months preceding the crash, global investment in U.S. markets caused the DJIA to appreciate 44 percent and evoke “concerns of an asset bubble.” Exacerbating the fallout were certain “structural flaws” including “trade clearing protocols” in both securities and derivatives markets that were later subject to regulatory “overhaul.”

Another factor that likely “amplified” the Black Monday crisis was an innovative product called “portfolio insurance” - ironically designed to insulate...

314 Id.
317 See id at 3-4.
318 Bernhardt & Eckblad, supra note 315.
319 Id. (“At the time of the crisis, stock, options, and futures markets used different timelines for the clearing and settlements of trades, creating the potential for negative trading account balances and, by extension, forced liquidations. Additionally, securities exchanges had been powerless to intervene in the face of large-volume selling and rapid market declines. After Black Monday, regulators overhauled trade-clearing protocols to bring uniformity to all prominent market products. They also developed new rules, known as circuit breakers, allowing exchanges to halt trading temporarily in instances of exceptionally large price declines.”); see also Jerry W. Markham & Rita McCloy Stephanz, The Stock Market Crash of 1987 – The United States Looks at New Recommendations, 76 GEO. L.J. 1993; Lawrence Harris, The Dangers of Regulatory Overreaction to the October 1987 Crash, 74 CORNELL L. REV. 927 (1989).
investors from a market crash. The Presidential Task Force on Market Mechanisms 1988 (the “Brady Commission”) suggested portfolio insurance “ignited” the crisis by facilitating “mechanical price-insensitive selling.” Those who purchased portfolio insurance (primarily mutual and pension funds and insurance companies) agreed to “short S&P 500 futures if the stock market fell by a certain amount” and by doing so they would reap an offset against the decline in the value of their portfolio. Ironically, a financial innovation that was designed to mitigate risk actually exacerbated a crisis. Those fearing ETF liquidity “death spirals”, see an analogous application: a financial instrument that is designed to provide liquidity could in fact amplify a run on liquidity and create a pro-cyclical sell-off in both the fund and the underlying assets (which could also cascade to other asset classes).

Portfolio insurance was designed to mirror a “put option”, thereby allowing investors to “preserve upside gains but limit downside risk.” It was strategically enacted through computer modelling programs that calculated “optimal stock-to-cash ratios at various market prices.” Most portfolio insurers adjusted ratios through a process called “dynamic hedging” where, as stock prices fell, an increasing number of futures-contracts were sold to offset portfolio losses. Model re-calculation and portfolio adjustment was costly, so models were updated periodically and then trading took place in “batches.” Futures were traded because they were both cheaper than stock trading, and because the institutions that provided the portfolio insurance didn’t have the ability (or authority) to trade their client’s portfolios. However, during Black Monday, the “simultaneous” use of portfolio insurance by investors (who were

323 Carlson, supra note 316 at 4.
324 Id.
327 Carlson, supra note 316 at 4.
among the day’s largest sellers) interacted with other market participants to accelerate the price decline and increase downward selling pressure.\textsuperscript{328}

Another problem with portfolio insurance was that futures contract buyers reacted by demanding deep discounts and, concurrently, “hedging their position by selling the underlying stocks” all of which contributed to pro-cyclical downward pressure on the market.\textsuperscript{329} Adding to the interaction fall-out were large institutions, who anticipated both a portfolio insurance sell off, and a surge in mutual fund redemptions and acted quickly to try and “pre-empt” the market selloff.\textsuperscript{330}

This created a “cascade effect”\textsuperscript{331} and also a downward “feedback loop” (similar to the feedback loop noted in the first section on ETF liquidity illusions): selling by portfolio insurers motivated selling by other participants which thereby prompted more selling by portfolio insurers.\textsuperscript{332} Another concern, cited by the SEC in its investigative report on Black Monday, was that non-portfolio insured investors had difficulty ascertaining how much selling was related to portfolio insurance and how much was from other market participants, and this opacity made corrective arbitrage difficult to execute.\textsuperscript{333}

Another parallel between ETFs and portfolio insurance is that in the latter, there was a generally accepted belief that if futures selling drove too steep a discount arbitrageurs would step in and purchase the clearly undervalued stocks, and this proved to be a fallacy.\textsuperscript{334} Index arbitrageurs were not active when they were needed.\textsuperscript{335} Also, opacity “abetted” the portfolio insurance crisis as many investors did not appreciate the “large number of assets” that were

\textsuperscript{328} Id. at 15-16.
\textsuperscript{329} Norris, supra note 325.
\textsuperscript{330} See Brady Commission, supra note 321 at 29
\textsuperscript{331} See Robert Shiller, Portfolio Insurance and Other Investor Fashions as Factors in the 1987 Stock Market Crash, in Stanley Fischer, ed. NBER MACROECONOMICS ANNUAL 1988, VOLUME 3, 287-297 (MIT Press, 1988) available at http://www.nber.org/chapters/c10958 (“The mechanism they referred to has been called a "cascade effect." An initial price decline starts a vicious circle by causing portfolio insurers to sell, causing further price declines, causing portfolio insurers to sell again, and so on.”)
\textsuperscript{332} Carlson, supra note 316 at 15.
\textsuperscript{334} Norris, supra note 325.
\textsuperscript{335} See Carlson supra note 316 at11 (“Usually, index arbitrageurs would use this as an opportunity to buy in the futures market and sell in the cash market, which would mitigate pressure in the futures market. However, index arbitrage traders were not active, due, in part, to the NYSE’s restrictions regarding use of the DOT system. This unusual pattern served to partly decouple prices in the futures and cash market.”)}
Financial market opacity emanates from many sources including a “lack of knowledge” on the part of participants, complex products and strategies, and “complexity in the network of actors involved in the strategy.” Just like portfolio insurance, ETFs could be also affected by information opacity regarding the complexity of the product, the participant network that sustains it, HF Trading generated noise, and difficulty ascertaining signal in a pro-cyclical crisis.

As discussed above in the “pro-liquidity” section, many industry participants believe that AP withdrawal in an ETF liquidity crunch will be met with new AP entrants who will profit off the arbitrage opportunity. If history, and portfolio insurance, is a guide this is not a certain proposition. Another parallel between portfolio insurance and the ETF market is a potential over-reliance on “program trading” which, in the case of portfolio insurance proved fallible in a crisis. Uncertainties linger about the extent that we can truly rely on risk modelling during a crisis. Quant-trading strategies and algorithmic trading reliance, especially when coupled with volatile ETF varieties like those using leverage, continue to be a cited concern of many.

A 2013 report from the Federal Reserve Board identified additional parallels between portfolio insurance and leveraged and inverse ETF trading. Both portfolio insurance and trading in inverse and leveraged ETFs leads to “destabilizing” effects (and cascade pressure) during periods of market volatility because daily rebalancing of “stock-to-cash ratios” is procyclical and these products generate directional “selling in a declining market and buying in a rising market.” Further, like portfolio insurance, the rebalancing of portfolios in ETFs is “mechanical” and attract other traders who look to pre-empt orders (also known as “anticipatory trading”).

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336 See Jacobs, supra note 102 at 270-271.
337 Id. at 270.
338 Norris, supra note 325; see also Carlson, supra note 316 at 15-16.
342 Id.
343 Id. at 2.
b. Auction Rate Securities & The Global Financial Crisis

The GFC highlights how relying on intermediated discretionary liquidity providers can be fragile in a crisis.\(^{344}\) Also, “market discipline” can fail when it is most needed.\(^{345}\) This occurred in the Auction Rate Security (ARS) failure.\(^{346}\) The comparison between ETF liquidity illusions and the failure of the ARS market was first noted in 2015\(^{347}\) by investment manager Howard Marks.\(^{348}\) ARSs were variable or adjustable rate bonds, often issued by a municipality, student loan finance authority or corporation, with a rate set, and periodically adjusted, through a Dutch Auction.\(^{349}\) They offered issuers long-term borrowing at short-term floating rates,\(^{350}\) and they were attractive to investors since they were considered “liquid, short-term, cash-equivalent” investments (like commercial paper) despite being in actuality floating rate, longer-term, fixed income securities.\(^{351}\)

Sellers brought their ARS to auction, where prospective purchasers (looking to ARS as money market substitutes\(^{352}\)) supplied competitive bids, indicating their desired purchase amount and the lowest acceptable interest rate they would pay.\(^{353}\) At the close of the auction the “clearing rate” (the rate all investors would receive until the next auction\(^{354}\)) was set with investor bids

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\(^{346}\) See Joe Prendergast, Craig McCann & Eddie O’Neal, Auction Rate Securities, 16 No. 4 PIABA B.J. 383 (2009).


\(^{348}\) See Stephen Foley, The Alchemy of ETF Liquidity is an Illusory Promise, FINANCIAL TIMES (April 4, 2015), https://www.ft.com/content/cc44cd76-d918-11e4-b907-00144feab7de.


\(^{351}\) See Prendergast et al., supra note 346 at 383.


\(^{353}\) See Adrian D’Silva, Haley Gregg & David Marshall, Explaining The Decline In The Auction Rate Securities Market, 236 CHICAGO FED LETTER 1, 2 (2008).

\(^{354}\) Id. at 2.
placed above this rate not filled.\textsuperscript{355} If the interest rate that cleared the auction (based on issuer default perception) was higher than the maximum issuer contractual rate then the auction “failed”, the coupon rate defaulted to the maximum rate in the issuer’s prospectus, and investors held on to their securities.\textsuperscript{356}

During the GFC, ARS auctions failed as major financial institutions – who ran the auctions and were relied on to provide liquidity support – withdrew,\textsuperscript{357} leaving a wide supply of nearly worthless ARS.\textsuperscript{358} ARS auction failure meant there were “insufficient bidders to cover the number of securities offered for sale.”\textsuperscript{359} ARS liquidity was “entirely dependent on the presence of sufficient orders to buy outstanding ARS” all of which was contingent on a “contractual ceiling” that the issuer was required to pay.\textsuperscript{360} Thus investors had no “put option” to sell their securities and the short-term nature of the investment required the “continual success of the period auction.”\textsuperscript{361}

It was believed that auction sponsors (broker-dealers) would step in and provide a backstop for auctions, in the event of failure - placing bids just below the contractual maximum, and allowing auctions to clear.\textsuperscript{362} This is exactly the opposite of what happened as auction sponsors instead withdrew from the market during the crisis\textsuperscript{363} – failing to make good on their “implicit” guarantee that they would intervene to ensure auction success - leaving issuers unable to reset rates (and also subject to penalties\textsuperscript{364}), and investors holding now illiquid (and devalued) securities they once thought were like cash.\textsuperscript{365} Banks withdrew from the ARS market because they were exposed to significant credit losses and mortgage write-downs at the time and thus “less willing to commit their money to supporting auctions in danger of failing.”\textsuperscript{366} The ARS failure resulted in

\textsuperscript{355} Id.
\textsuperscript{356} Prendergast et al., supra note 346 at 383.
\textsuperscript{357} See Brendan P. Tracy, If It’s Broken, Sometimes It Can’t Be Fixed: Why The Auction Rate Securities Market Was Faulty From Its Inception And How Broker-Dealers Caused Its Downfall, 4 BROOK. J. CORP. FIN. & COM. L. 297 (2010).
\textsuperscript{359} D’Silva et al. supra note 353 at 2.
\textsuperscript{360} Id.
\textsuperscript{361} Prendergast et al., supra note 346 at 383.
\textsuperscript{362} Id.
\textsuperscript{363} See Amod Choudhary, Auction Rate Securities = Auction Risky Securities, 11 DUQ. BUS. L.J. 23 (2008).
\textsuperscript{364} D’Silva et al. supra note 353 at 2.
\textsuperscript{365} See Ross, supra note 350.
\textsuperscript{366} D’Silva et al. supra note 353 at 2.
settlements of over $50 billion to aggrieved investors who alleged the products, and liquidity risks, were not adequately described (or were misleading). 367

As identified by Marks and others, the ETF market echoes some of the follies of the ARS failure. 368 First, there was a perception that ARS would be liquid, which later proved illusory when intermediaries who were relied on to support the auction withdrew. This turned out to be a case of “discretionary” liquidity – in other words, intermediaries only supported the auction when it was in their best interest to do so. This is similar to some of the expressed fears in ETFs – that the APs and other MMIs (particularly those run by computer algorithms) will back out when it is in their best economic interest to do so, and stop providing liquidity support to retail investors in the secondary market.

vi. Conclusion

This article has shown that ETFs, despite their benefits, could destabilize markets. As the case studies of portfolio insurance in the 1980s, and the auction rate securities market during the GFC show, Wall Street will, at times, create new financial products that, like ETFs, promise perpetual liquidity through intermediated structures that rely on discretionary actors. These products may also combine leverage, complexity, and structural opacity to further decrease financial stability. 369 Despite the calming voices from the ETF industry, history illustrates that discretionary liquidity and arbitrage reliance isn’t always there when you need it. Also, financial product innovation can generate pro-cyclical market accelerations because of the complex interactions of market participants in a crisis.

Hyman Minsky and others have prominently argued that financial innovation, in and of itself, can facilitate future crises. 370 From portfolio insurance and dynamic hedging in 1987, to securitizations and collateralized debt obligations in the GFC, financial product innovation seems to consistently


368 See Foley, supra note 348.

369 See Jacobs, supra note 102 at 4-5, 270-271.

370 See HYMAN MINSKY, HYMAN. CAN "IT" HAPPEN AGAIN? ESSAYS ON INSTABILITY AND FINANCE. (1ST ed. 1982); see also Hyman MINSKY, STABILIZING AN UNSTABLE ECONOMY (1ST ed. 1986); Hyman Minsky, Financial instability revisited: The economics of disaster. 3 REAPPRAISAL OF THE FEDERAL RESERVE DISCOUNT MECHANISM 97 (1972); See also Randall L. Wray, Global Financial Crisis: A Minskyan Interpretation of the Causes, the Fed’s Bailout, and the Future, LEVY ECONOMICS INSTITUTE OF BARD COLLEGE WORKING PAPER NO. 711 (March 30, 2012), available at https://ssrn.com/abstract=2031721.
show up as a central factor in a crisis - driving market instability while fostering more complex intermediary connection points. When assessing financial innovation (including financial technology) it is worthwhile to consider the impact of deepening complexity in regulatory oversight structures.

Now Bank of England Chief Economist Andrew Haldane, in his well-known “dog and the frisbee” speech, makes a strong case, citing numerous studies in behavioral economics and complex decision making under uncertainty, that the most appropriate regulatory response to financial complexity isn’t more complexity, but rather to “simplify and streamline the control framework.” When it comes to ETF risk disclosure perhaps “more isn’t more” and instead we should heed Haldane’s advice (which was at the time being made to the bank capital frameworks under the Basel regime) and look to “cutting back the thicket, re-sizing the haystack.” One of the ways to simplify the ETF regulatory frameworks, and focus on the unique risks, is to heed Professor Hu and Morley’s proposal of a “comprehensive” approach to ETF regulation that focused on the “arbitrage mechanism.”

Similarly, regulatory regimes can facilitate what Professor Richard Epstein describes as uncertain “cumulative and interactive effects.” Any attempt at regulatory simplicity begs an inquiry into the purpose of governing legislation for a given domain – and to this end financial regulation has been advocated as increasingly requiring “systemic” considerations. This necessitates a “public goods” analysis since, as ETFs clearly show - actions rationally undertaken by individuals can facilitate collective instability.

There are good reasons to avoid a response to market complexity with heightened regulatory complexity – particularly when we don’t know how regulation itself could exacerbate a future crisis, induce iatrogenic or “nonlinear”

373 Id.
374 See Hu & Morley, A Regulatory Framework; supra note 75; see also Hu & Morley, A Welcome Invitation, supra note 75.
377 Id. at 232.
effects, or facilitate economic rent seeking. As Epstein has documented “there has been a massive increase in the frequency and complexity of the legal rules that govern society” and this is “neither inevitable nor desirable.” Unfortunately increased regulatory complexity has certainly been the case in financial markets, and with increased regulatory complexity comes a greater potential for unintended consequences. Of note, the SEC’s recent transaction fee pilot program for national market system (NMS) stocks (including ETFs) which imposes temporary pricing restrictions on exchanges and ATS (including “maker-taker” liquidity models) with a goal of “improving pricing, liquidity, and trade execution quality” has attracted recent criticism (and litigation) from several exchanges.

Another idea, previously canvassed in the literature, is whether a government “market liquidity provider of last resort” (MLLR) could be established as proposed by Professor Steven Schwarcz. Such a mechanism might reduce the “consequences of failure” associated with temporary market panics - like a sustained period of ETF arbitrage breakdown and resulting

 See Cheng-Yun Tsang, The Seven Deadly Sins of the Contemporary Financial System, 37 REV. BANKING & FIN. L. 359, 360-361 (2017). (“Modern financial markets operate like a complex adaptive ecosystem. Moreover, like an ecosystem, policy or regulatory change is often influenced by complexity science elements, such as nonlinearity or emergence. This means that regulatory efforts intended to affect market actors' behaviors may lead to an unexpected outcome, or steer them in an unintended direction.”)

 See Turbeville, supra note 359 at 1203. (“Modern capital and derivatives markets are exceedingly complex and involve multiple methods for extraction of value by the financial sector that must be paid for by the productive economy. The amount extracted is demonstrably far higher than historic data or reasoned analysis suggests could possibly be reasonable. The rents extracted by the financial sector for intermediating capital investment are inefficiently high.”)

 Epstein, supra note 375 at 21.


 See Bibb Strench, SEC’s NMS Pilot Program of Vital Interest to ETFs, THOMPSON HINE ETF UPDATE (May 10, 2018), https://www.thompsonhine.com/publications/secs-nms-pilot-program-of-vital-interest-to-etfs. (“Data from the Pilot will be used to inform the SEC, market participants and the industry about the effects of transaction-based fees and rebates under the three models. *....*....*....* The Pilot also will require the national securities exchanges to prepare and post on their websites public and downloadable data including aggregated and anonymized order routing data (updated monthly), and an XML dataset of standardized information on their transaction fees and rebates.”)


 See Schwarcz, Regulating Complexity, supra note 381 at 247-250.
illiquidity – by providing “functional modularity” to the crisis episode, and preventing spillover effects to other financial system.\textsuperscript{386} There are many considerations before resorting to such a measure – like whether APs and MMs should be required to provide liquidity support, and the extent ETF ecosystem participants (including APs, MMs, and ETF sponsors) should pay fees to the entity.\textsuperscript{387}

Professor Schwarcz maintains that the cost of this liquidity provider would be “minimal” when compared to the “lender of last resort” function of the Federal Reserve in the GFC, and had such an entity been in existence in the GFC, much of the damage of the subprime crisis could “restricted in scope and lessened in impact.”\textsuperscript{388} An MLLR would theoretically provide modularity by “investing in securities of panicked markets” in contexts where the value of these securities deviates drastically from the “intrinsic value” of the underlying assets (as a result of irrational investor panic or herding behaviors).\textsuperscript{389} This would provide a “floor” to the short-term panicked market.\textsuperscript{390}

Schwarcz also suggests that concerns of taxpayer burden and moral hazard are effectively mitigated because a MLLR will only intervene when it sees a profit opportunity (based on the underlying asset value deviation).\textsuperscript{391} One naturally wonders why private entities wouldn’t undertake the same arbitrage activity, given the obvious profit potential? But as this article has shown, the behavior of private intermediaries in a crisis is unpredictable. Black Monday showed that arbitrageurs are sometimes nowhere to be found when a perfect storm crystalizes around panicked selling, interaction risks, contagion, information cascades and asymmetry. Also, the costs, if you’re wrong, of acting

\textsuperscript{386} See Id. at 215-216; see also discussion at 247-248 (“One such possible approach is to establish a governmental entity to act, if needed, as a market liquidity provider of last resort (hereinafter, “market liquidity provider”) in order to more loosely couple the feedback effects. This approach takes inspiration from chaos theory, which recognizes that failures are almost inevitable in complex systems, and that successful systems are those in which the consequences of a failure are limited. *...*...*...*. A market liquidity provider would work in much this same way, providing functional “modularity” to limit the consequences of financial-market failure by directly investing in securities of panicked markets. Financial markets rely critically on the supply of liquidity in the form of credit. If a failure deprives a particular market of liquidity, a market liquidity provider can restore liquidity before that market collapses and endangers other financial markets.”)

\textsuperscript{387} See id. at 216.
\textsuperscript{388} Id at 251.
\textsuperscript{389} Id. at 248-249.
\textsuperscript{390} Id. at 252.
\textsuperscript{391} Id.
during a panic are both financial and reputational.\(^{392}\) There is no certainty, however, that the government will be “right” in its interventional timing either.

New financial products can be beneficial, but they can also destabilize markets. The benefits of ETFs have facilitated a massive post-GFC surge in market capitalization. Given this trend, ETFs could likely house a sizeable share of American retirement savings in the future, and continue as a preferred vehicle for institutional investors, HF traders and robo-advisors. How ETF liquidity will play out in a full-blown future crisis is unknown. The arguments advocated by BlackRock and other industry participants may prove prescient, but this will only be known over time.

It’s impossible to predict how (or when) a new crisis will happen. The growth in size and importance of ETFs as an asset class; how they connect retail investors, pension funds and Wall Street; the potential instabilities they could create; and the long-term uncertainty that passive investing will have on the economy, make ETFs a critical, yet significantly understudied, segment of consumer finance that deserves closer academic and regulatory scrutiny. ETFs have not undergone a true liquidity test.\(^{393}\) Part II of this study will continue an investigation into ETF market instabilities by introducing other “interaction risks” manifest through the potential for investor herding, and the transmission of informational inefficiencies throughout the ETF operational ecosystem.

\(^{392}\) Id. at 255.

\(^{393}\) See Deutsche Bundesbank ETF Report, supra note 104 at 79, see also 13D RESEARCH, supra note 285.
Chapter II: Exchange Traded Funds & the COVID-19 Crisis

i. What Have We Learned So Far About ETFs in the COVID-19 Crisis?

The following subchapter was published on April 3, 2020 on the Duke Law School’s, Global Financial Markets Center, FinReg Blog and is available at https://sites.law.duke.edu/thefinregblog/2020/04/03/what-have-we-learned-so-far-about-etfs-in-the-covid-19-crisis/

ETFs are at the heart of the COVID-19 financial crisis. Over 40 percent of the trading volume during the mid-March selloff was in ETFs (multiple times the percentage in January), making them the “tool of choice” for many crisis traders. Using ETFs to trade through a crisis makes sense – they offer high intraday liquidity and instant exposure to entire asset classes, industry sectors, and even global markets. They’ve also shown recent value as futures substitutes when liquidity thinned in derivatives markets.

Besides their popularity as a preferred crisis trading tool, what have we learned about ETFs so far in the COVID-19 crisis?

First, the pandemic has revealed fragilities – most noticeably deep discounts in the trading price of many ETFs relative to their underlying net asset value. It’s also confirmed pre-COVID-19 fears that intermediaries could back away from arbitraging away price discounts in a crisis, validated prior reports

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395 Id.
397 Lim & Frankl-Duval, supra note 394.
399 See Clements, supra note 396 at 34.
that ETFs are the new cash substitute;\textsuperscript{400} and shuttered a variety of ETFs that maybe shouldn’t have ever existed in the first place.\textsuperscript{401}

Most importantly, given the Federal Reserve’s unprecedented de facto bail-out of investment grade corporate credit ETFs,\textsuperscript{402} it’s sparked an unsettled debate on the systemic importance of certain asset managers that are the largest ETF sponsors.\textsuperscript{403}

\textbf{a. Liquidity mismatch and arbitrage instability concerns in ETFs are real}

Much of the early selling in ETFs were in equity indexes in a flight to quality towards bond funds.\textsuperscript{404} The safety of bond ETFs proved precarious, however, when pre-COVID-19 fears of “liquidity mismatch”\textsuperscript{405} – a topic I discussed with Lee Reiners in January on the Duke FinReg Pod - materialized with discounts emerging between bond ETF trading prices and their underlying net asset values (NAV).\textsuperscript{406} Unprecedented discounts also emerged in ETFs with illiquid underlying equities, like BlackRock’s \textit{iShares MSCI Philippines ETF} (EPHE) which reported a 15 percent discount to NAV on March 16\textsuperscript{th}.\textsuperscript{407} One report estimated that, thus far in the COVID-19 crisis, there have been around 700 ETFs trading “at least 1\% or more higher or lower than that fund’s NAV.”\textsuperscript{408}


\textsuperscript{404} Lim & Frankl-Duval, \textit{supra} note 394.

\textsuperscript{405} See Clements, \textit{supra} note 396 at 36.

\textsuperscript{406} Lim & Frankl-Duval, \textit{supra} note 394.


Pricing discounts were widely manifest in credit ETFs, even for those with “negligible credit or term risk” like ultra short duration funds, even investment grade corporate credit funds were most heavily impacted. Even the corporate bond funds of the largest ETF issuers - BlackRock and Vanguard - started “trading out of sync with their underlying assets.” For example, the week through March 20th, BlackRock’s iShares iBoxx $ Investment Grade Corporate Bond ETF (LQD) closed at a 5 percent discount to its NAV, later rebounding to a premium of 3.2 percent NAV after the Fed’s measures were announced.

NAV discounts are common in closed-end funds; however, unlike a closed-end fund, an ETF uses a unique “arbitrage mechanism” to continuously align its trading price with its NAV. The problem is that this arbitrage function, which involves the continual creation and redemption of ETF shares by large financial institutions called “authorized participants” (APs), is performed discretionarily and is motivated by market incentives, not legal obligations. AP’s failure to “arb away” the discounts in the ETF market during this crisis has validated many pre-COVID-19 concerns about AP “step away” risk during spikes of volatility and market uncertainty.

The Fed’s move to buy up corporate bonds and ETFs helped to stabilize the “massive dislocations” between prices and value, and restore at least some short-term stability in the credit fund sector. It also staved off a run on fixed-income mutual funds which may have had to unload corporate bonds onto the market at fire sale prices to meet investor cash redemption demands. This

409 See Gerstein, supra note 398.
412 Id.
413 Eckett, supra note 410.
415 Gerstein, supra note 398.
417 Id.
419 Id.
could have easily triggered a selling cascade across other credit ETFs, to underlying bonds, and in turn driven more mutual fund redemption runs.\footnote{420}

**b. ETFs as cash substitutes, while others maybe shouldn’t exist at all**

Crisis trading also revealed that ETFs are being used as cash substitutes.\footnote{421} This confirms pre-crisis studies by the European Systemic Risk Board.\footnote{422} Market reports show ultra-short duration treasury ETFs like BlackRock’s \textit{iShares 1-3 Year Treasury Bond ETF} (SHY) benefiting from massive funding flows in early March (in an early flight to quality) only to experience a whipsaw outflow after the Federal Reserve unleashed its stimulus package and investor funds quickly herded to high-grade corporate credit ETFs in an “all clear sign for risk assets.”\footnote{423}

Also, in an episode somewhat reminiscent of the failure of certain volatility-linked inverse exchanged traded products (ETPs) in 2018,\footnote{424} several three-times leveraged, oil-linked ETPs issued by \textit{WisdomTree} were forced to close after crude oil prices plummeted amidst oil-price war fears.\footnote{425} Similar products issued by \textit{USB}, \textit{Société Générale} and \textit{Janus Henderson} experienced significant losses, raising (again) the question of why some of these products exist in the first place, especially in light of regulatory warnings regarding their unsuitability for most investors.\footnote{426}

As coronavirus fears pounded the markets, many ETFs were forced to shutter. Bloomberg recently reported that 72 ETFs have closed in the first quarter of the year (representing $1.4 Billion) with “niche” indexes, and leveraged funds that use derivatives hit particularly hard.\footnote{427} Other ETFs, like

\footnotesize{\textsuperscript{420} See Ryan Clements, \textit{supra} note 403.\hfill\textsuperscript{421} Katherine Greifeld, \textit{Cash-Like ETFs See $3 Billion Exit After Fed Steps Into Market, Bloomberg} (March 30, 2020), https://www.bloomberg.com/news/articles/2020-03-30/fading-funding-squeeze-spurs-3-billion-exit-from-cash-like-etfs.\hfill\textsuperscript{422} See Pagano, Serrano & Zechnner, \textit{supra} note 400 at 3-4, 28-29.\hfill\textsuperscript{423} Greifeld, \textit{supra} note 421.\hfill\textsuperscript{424} See Ryan Clements, \textit{If We Can, Does It Mean That We Should? Volatility Linked ETPs and the Recent Crash, DUKE FINREG BLOG} (February 10, 2018), https://sites.duke.edu/thefinregblog/2018/02/10/if-we-can-does-it-mean-that-we-should-volatility-linked-etps-and-the-recent-crash/.\hfill\textsuperscript{425} Chris Flood and Attracta Mooney, \textit{Crude Price Crash Hits Oil-Linked Exchange Traded Products, FINANCIAL TIMES} (March 15, 2020), https://www.ft.com/content/ce8a2b61-8f71-4bea-a391-3564b4409e28.\hfill\textsuperscript{426} Id.\hfill\textsuperscript{427} Greifeld & Kochkodin, \textit{supra} note 401.}
gold-linked funds have, however, seen a surge in investor inflows;\textsuperscript{428} while several new “non-transparent” actively-managed ETFs are coming to market for the first time, despite the precarious timing.\textsuperscript{429}

c. ETFs and the Federal Reserve’s “Infinite QE” policy

In the week through March 25\textsuperscript{th} the Federal Reserve expanded its balance sheet by $586 billion to $5.25 trillion – topping the $5 trillion mark for the first time in history - as it stabilized bond and money markets, and extended credit to primary dealers (and dollar swap lines to other central banks) in a fast move to mitigate the coronavirus economic fallout.\textsuperscript{430} In the wake of the Fed’s quick response were a host of concerns about the implications of it being a “buyer of last resort,” with one commentator suggesting we’re now “past the point of QE infinity” and in the process the Fed has fostered a “post-Lehman crisis legacy of distorted risk premia in markets.”\textsuperscript{431}

The newest member of the “infinite” QE club are ETFs that track the investment grade corporate debt sector.\textsuperscript{432} The Fed’s expansive stimulus package (one commentator called it an “alphabet soup of new asset buying programs”\textsuperscript{433}) includes a Secondary Market Corporate Credit Facility (SMCCF),\textsuperscript{434} which can purchase “up to 20% of the assets of any exchange traded fund that provides broad exposure to the investment grade bond


\textsuperscript{431} Michael Mackenzie, \textit{The Federal Reserve has gone well past the point of ‘QE Infinity’}, FINANCIAL TIMES (March 23, 2020), https://www.ft.com/content/11b338a2-6d0c-11ea-89df-41bea055720b.

\textsuperscript{432} Id.


ETFs won’t, however, be eligible as pledged collateral in the Fed’s Primary Dealer Credit Facility. A variety of justifications have been advanced for the Fed’s unprecedented bailout of corporate bond ETFs including indirect support for the banking sector (since large credit ETFs also hold bank debt), allowing the Fed to hold longer duration corporate bonds, and preventing the bust of an economy currently in “suspended animation.” Also, purchasing high investment grade corporate credit ETFs are more efficient than individual bonds (since the Fed can provide support to many bond issuers at the same time). Accurate pricing of ETFs and underlying bonds will, however, be difficult in the days to come as the market continues to oscillate.

The Fed’s move is unprecedented, but it’s very possible that it prevented (hopefully not just delayed) a complete financial market meltdown. Yet it may have also preserved Wall Street’s propensity for making “outlandish promises” about the performance (and liquidity) of their financial products.

d. With government support, could ETF sponsors be systemically important?

Shortly after the Fed signalled its intention to purchase corporate bonds and credit ETFs. BlackRock’s LQD jumped 7.4% with investor inflows of $1.06 billion. Notably, LQD isn’t the only BlackRock sponsored ETF that stands to benefit from the Fed’s de facto bailout. Its iShares Broad USD Investment Grade Corporate Bond Fund (USIG) could also potentially benefit, as could other

435 Scaggs, supra note 402.
437 Scaggs, supra note 402.
438 Mackenzie, supra note 431.
440 Id.
441 Id.
mega-ETF issuer’s funds including Vanguard’s Total Corporate Bond Market ETF (VTC) and Pimco’s Investment Grade Corporate Bond ETF (CORP).444

In executing its stimulus measures, the Fed tapped BlackRock, the world’s largest asset manager (and largest ETF sponsor), to manage the purchase of new, and previously issued, U.S. corporate investment grade bonds and ETFs, and agency guaranteed445 commercial mortgage-backed securities secured by multi-family home mortgages.446

The Fed’s investment grade bond ETF purchases will take place in the “previously issued” component of the SMCCF. This presents, a *prima facie* conflict since BlackRock is also the world largest bond ETF issuer (and sponsor of eligible ETFs), and safeguards have been announced including a 20 percent investment limit on a given ETF.447 The extent that BlackRock’s corporate credit funds will find their way onto the Fed’s balance sheet is a contested topic amongst analysts.448

ETF sponsors, like BlackRock, are clearly distinct from banks and insurance companies since they act as agents, use less leverage, a smaller balance sheet, and can’t access government-insured deposits as a source of funding.449 Also, up until the Fed’s COVID-19 stimulus, they lacked access to central bank support. The crisis has revealed, however, that not only are ETFs a widely-used trading tool and a large store of investor wealth, but that the government views them as crucially “interconnected” to the corporate credit sector, and worthy of stimulus intervention to curb a larger economic fallout.

The systemic importance of the largest ETF sponsors is worthy of assessment. These firms sit interconnected in the financial system through a complex operational structure, that creates numerous contractual, institutional and sectoral interdependencies, and in the process interlinks credit exposures

444 Scaggs, *supra* note 402.
447 Id.
while performing liquidity transformation through their products. Further, an operational event, or failure, at one of the mega ETF firms could easily drive a fire sale in ETFs that could cascade across other firm’s products to underlying assets, impact the operations of APs and market markers (which are critical to an ETF’s operational ecosystem), and harm investors and corporations in the process.

There’s an unsettling form of market alchemy that takes place when illiquid, over-the-counter bonds are transformed into instantly liquid ETFs. ETF “liquidity transformation” is now being supported by the government, just like liquidity transformation in mortgage backed securities and shadow banking was supported in 2008. Given the “social costs” (in the form of government support) of ETF liquidity transformation, perhaps subjecting their centrally interconnected mega-sponsors to enhanced safeguards may be necessary.

e. Concerns regarding BlackRock’s interconnective influence?

This isn’t the first time that the government has tasked BlackRock with overseeing asset management activities during a crisis (it also procured its services to manage the assets of Bear Stearns and AIG). BlackRock’s influence far transcends the Fed’s current asset management task, and its operations (along with other large ETF sponsors) are creating complex economic interconnections between retail and institutional investors, banks, financial institutions, and market service providers, as well as influencing the behaviors of corporations through proxy voting.

450 Id.
451 Id.
452 Randall W. Forsyth, Corporate Credit Could Be the Next Bubble to Burst, BARRON’S (Feb. 15, 2019, 11:42 AM), https://www.barrons.com/articles/debt-be-not-proud-danger-in-the-complacency-about-corporate-credit-51550248974 (“In 2007, the lie was that you could take a cornucopia of crap, package it together, and somehow make it AAA. This time, the lie is that you can take a bunch of bonds that trade by appointment, lump them together in an ETF, and magically make them liquid.”)
454 See Morgan Ricks, Regulating Money Creation After The Crisis, 1 HARV. BUS. REV. 75, 78, 119-120 (2011).
At a minimum, one wonders just how influential BlackRock and its risk management and financial modelling system Aladdin (which will be heavily utilized in the current bond and ETF purchasing program) has become to global financial markets and governments. A recent European Banking Institute working paper on “financial operating systems” (FOS) includes a significant profile on BlackRock’s Aladdin, and describes it among “the most consequential and unexamined developments in global finance.”

The authors note that it is the FOS with “by far the greatest impact” on global and U.S. asset management, with over 25,000 clients, and influence on more than $20 trillion in assets (an amount equal to “four times the value of all cash in the world, the annual GDP of the U.S., or the total U.S. stock market capitalization.”) The sheer scope of Aladdin’s risk modelling influence and data control, when coupled with BlackRock’s assets under management, its ability to steer current economic stimulus measures, and its central interconnection as the world’s largest ETF issuer make its systemic importance of a matter of live concern.

f. Did ETFs achieve an important stress testing milestone?

The “abnormal gap” between market prices and underlying asset values, evidenced across ETFs in the COVID-19 crisis, has evoked fears that these products aren’t as resilient as Wall Street would have us think, and investors aren’t able to obtain fair pricing when they look to sell (a concept referred to in the literature as a “liquidity illusion”). It also invigorates concerns of arbitrage fragility in the ETF operational structure given the fact that, before the Fed’s bailout, APs and other discretionary market makers couldn’t (or wouldn’t) actively arbitrage away the price discounts in ETFs.
Yet others counter that ETFs have actually passed an important “stress test” in the COVID-19 crisis.\textsuperscript{462} Despite the discounts, a market did exist for investor exits during the worst segments of the early sell-off.\textsuperscript{463} Some say that ETFs have also acted as a price discovery vehicle (reflecting the “true” fair market value of the underlying bonds) and as a “liquidity wrapper,” a valuable modern technology to absorb news faster than the underlying assets ever possibly could.\textsuperscript{464} Further still, others posit that even if liquidity in credit ETFs came with a discount to NAV (an exit “premium” if you will), there was at least a market, which isn’t necessarily the case for the underlying bonds.\textsuperscript{465}

The problem with liquidity wrapper and price discovery justifications is that they neglect to consider what might have happened had the Fed not stepped in. The primary concern is that a “doom loop”\textsuperscript{466} could have materialized where continued selling pressure in the ETF market exacerbated a fire-sale in the underlying, and again vice-versa, in a procyclical pile-on with devastating consequences.\textsuperscript{467}

Perhaps the key question underscoring the COVID-19 scorecard for ETFs is what, exactly, are investors using them for? As Bloomberg analyst Brian Chappatta aptly noted, “[i]f investors are simply turning to them for instant price discovery and liquidity, then the funds have certainly held up their end of the bargain,” but if investors are seeking an accurate real time tracking of the underlying index then “they’ve been let down amid this market turmoil.”\textsuperscript{468} Above all, we are also now left wondering whether the Fed’s intervention has set a precedent that it will act as the “guarantor of last resort” against future instability in the ETF market.

\textsuperscript{463} Id.
\textsuperscript{464} See Lim, supra note 411.
\textsuperscript{465} See Eckett, supra note 410.
\textsuperscript{466} See Peter Chatwell, The liquidity ‘doom loop’ in bond funds is a threat to the system, FINANCIAL TIMES (March 24, 2020), https://www.ft.com/content/b7c15426-6e1b-11ea-89df-41bea055720b.
Exchange traded funds (ETFs) sit at the center of the COVID-19 crisis selloff.469 This isn’t surprising, since ETFs are a low-cost highly liquid vehicle for trading entire sectors, asset classes, and even global economies. Yet the use of ETFs as a preferred crisis trading tool, and the Federal Reserve’s unprecedented mid-crisis purchasing of bond ETFs,470 reinvigorates a long-standing debate on the systemic importance of ETF sponsors.

Yet the largest ETF sponsors are becoming systemically important due to interconnectedness - a material factor in the 2008 global financial crisis (GFC). Although large ETF sponsors are distinct from banks and insurance companies, there’s merit in safeguarding their economic resilience given their central interconnectedness, government bail-out potential, and ability to ignite numerous risk transmission channels, in a highly complex financial ecosystem.

a. Moving Beyond Size: When Financial Firms Become “Too Interconnected To Fail”

Today’s financial markets exhibit both “complex links” and deeply interconnected firms.471 The GFC clearly illustrated that size is an incomplete measure of a firm’s systemic importance, and smaller, yet widely interconnected firms can also destabilize the financial system.472 Because modern financial markets operate as a “system,” if a firm sits at the center of this system, there’s

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merit in safeguarding its economic viability and ensuring that it won’t exacerbate shock transmissions.

My article describes numerous interconnected shock transmission channels that could emerge from the operations, or disruption of ETF sponsors including interlinked credit exposures, operational complexity, liquidity transformation, and contractual, sectoral and institutional interdependencies.

b. How do ETFs Create Complex Economic Interconnections?

My article identifies a myriad of demand factors behind ETF growth including passive investment outperformance, active management disillusionment, instant diversification, high liquidity, tax benefits, low costs, instant exposure to opaque sectors, asset classes and novel index strategies, use by robo-advisors and fintech platforms, and cash substitutability for institutional investors in the growing fixed-income ETF market.

I show that ETF’s are, however, fostering deep and complex interconnections between numerous financial institutions, banks, market participants and service providers, extending to retail and institutional investors, and affecting corporate behavior and decision making. They function globally in a complex operational ecosystem with many participants, highly reliant on the discretionary incentives of large financial intermediaries who perform a critical “arbitrage function,”473 and dependent on secondary liquidity, and market service providers.

Even with the current crisis, mega ETFs sponsors (who are also the world’s largest asset managers) wield significant proxy voting power over publicly traded companies, including competitors in systemically important sectors like banking.474 I argue that they connect financial firms through securities lending, link institutional investors with corporate debtors when the former use fixed-income ETFs as cash substitutes, and influence herding as investor portfolios and risk models become increasingly correlated, and technology systems like BlackRock’s Aladdin, gain institutional prominence.

c. How Could ETF-Driven Interconnectivity Contribute To Financial Market Systemic Risk?

My article outlines how ETFs create both direct and indirect systemic risk transmission pathways that aren’t present in other managed asset products. The coupling of ETF share prices with underlying net asset value relies on effective arbitrage by authorized intermediaries or discretionary market makers; and the current crisis is revealing arbitrage instability in bond ETFs. ETF operational complexity fuels informational opacity in a crisis, and ETF fire sales can drive procyclical liquidations in underlying assets – particularly concerning for bond ETFs characterized by “liquidity mismatch” with moral hazard for underwriters to originate riskier debt to satisfy demand.

As the current crisis has revealed (and my article highlights), ETFs are a haven for short-term traders, a hot-bed for new derivatives, and there’s evidence they increase market volatility. I suggest that ETF securities lending creates multiple risk transmission channels, and if an operational disruption occurred at a large ETF sponsor investors could herd to quality, triggering contagion selloffs in competitor ETF products and underlying assets, uncertainty in the operations of authorized intermediaries, with significant losses accruing to retail investors, pensions and corporations.

d. The Challenge of Regulating Highly Interconnected ETF Sponsors

Regulating highly interconnected ETF sponsors is difficult since they have distinguishing characteristics from banks and insurance companies. ETF sponsors do perform an agency function, with smaller balance sheets, less leverage, substitutable products, and an inability to access central bank liquidity or benefit from government insured deposits for low-cost funding. Thus, the largest ETF sponsors were also strongest advocates in favor of the Financial

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475 See Peter Chatwell, The liquidity ‘doom loop’ in bond funds is a threat to the system, Financial Times (March 24, 2020), https://www.ft.com/content/b7c15426-6e1b-11ea-89df-41be055720b.


Stability Oversight Council’s embrace of an activities-based framework (away from entity-specific) for non-bank systemically important financial institutions.\footnote{478}

I counter-submit in my article, however, that activities-based regulation, utilizing cost-benefit analysis, is problematic for unpredictable fast-moving crises and complex, highly interconnected firms with opaque and global operations (like large ETF sponsors). It also doesn’t curb the interconnection-generated risk transmission channels unique to ETFs. Thus, I lend support to prior studies that consider both activities and entity-based regulation as “complimentary” when addressing financial market systemic risk emanating from non-bank financial firms.\footnote{479}

\section*{e. What Are The True Costs of Liquidity Transformation?}

When assessing the interconnective influence of large ETF sponsors one must consider the costs of liquidity transformation. Turning opaque, over-the-counter traded, bonds or loans into instantly liquid, cash-substitutable financial products evokes concerns of the mortgage-backed securities and collateralized debt obligations market in the GFC.\footnote{480} The Fed providing relief to bond ETFs is reminiscent of bail-outs of the shadow banking and money-market mutual fund industries that also performed liquidity transformation.\footnote{481} If government support is a “social cost” of liquidity transformation,\footnote{482} then perhaps, now that the

\footnotesize{\begin{itemize}
\item \footnote{479} See Jeremy C. Kress, Patricia-Ann McCoy, and Daniel B. Schwarcz, Regulating Entities and Activities: Complementary Approaches to Nonbank Systemic Risk, 92 S. Cal. L. Rev. 1455 (2019).
\item \footnote{481} Id at 61-64; see William A. Birdthistle, Breaking Bucks in Money Market Funds, 2010 Wis. L. Rev. 1155, 1163, 1190.
\item \footnote{482} See Morgan Ricks, Regulating Money Creation After The Crisis, 1 Harv. Bus. Rev. 75, 78, 119-120 (2011).
\end{itemize}}
government has entered the ETF arena, firms providing these services should be subject to higher safeguards.

Despite the current crisis, ETFs retain compelling utility for retail and institutional investors as low-cost diversified investment products. Post-crisis, ETF sponsors will continue to sit centrally and globally interconnected in a complex financial market, and their products will be used in future crises as hedging and speculation instruments,\textsuperscript{483} while simultaneously housing many citizen’s savings and retirement assets. ETF sponsors may become “too interconnected to fail” and the most effective regulatory framework may require a “system-wide” toolkit with implications for both firms, participants and activities.\textsuperscript{484}

\textsuperscript{483} \textit{See} Lim & Frankl-Duval, \textit{supra} note 469.
\textsuperscript{484} \textit{See} Andrew G. Haldane, \textit{Rethinking the Financial Network}, Speech Given to Financial Student Association, Amsterdam (April 28, 2009), available at https://www.bis.org/review/r090505e.pdf.
Chapter III: Exchange Traded Funds & “Interaction Risks”


i. Abstract

Exchange Traded Funds (ETFs) – tradeable investments that provide a return linked to an underlying index or basket of assets – are likely the most successful financial product since the 2008 crisis. Over the last decade they’ve experienced remarkable growth. Yet these products may also be making the financial system less stable and, like Wall Street innovations of the past, connecting banks and main street with dangerous implications. This final article - of a two-part study on ETF risks - posits that these products may be introducing two “interaction risks” into financial markets due to a complex operating and trading ecosystem. First, ETFs could contribute to information cascades, facilitate investor herding, and financial contagion. Second, ETFs, along with other index-based products, could be distorting the informational efficiency of underlying asset and securities prices, and disincentivizing active price discovery, in a way that masks market risk.

This article builds on its predecessor, which showed how ETFs could create a fragile “illusion” of liquidity, since financial intermediaries, in a crisis, often act unpredictably and pursue discretionary incentives. The combined study compliments prior work on financial market systemic risk by analogizing ETF interaction risks to prior crises – particularly 2008. Given the comparisons, the ETF market’s continuing growth and interest by retail investors, institutions, and pensions, regulatory and academic attention should be increased to ensure risks are both understood and appropriately mitigated. This article introduces several areas where heightened focus is warranted.

ii. Introduction

A strong case can be made that Exchange Traded Funds (ETFs) – tradeable investments that provide a return linked to an underlying index or
basket of assets— are the most successful financial products since the 2008 global financial crisis (GFC).\textsuperscript{485} ETFs have experienced a tremendous post-GFC surge,\textsuperscript{486} while connecting retail investors with pensions and major banks.\textsuperscript{487} They are also believed by many to be a lower-cost, tax advantaged,\textsuperscript{488} easily tradeable, instant diversification, upgrade over mutual funds.\textsuperscript{489} Yet they may also be making the financial system less stable.\textsuperscript{490} Signs point to continued market growth,\textsuperscript{491} especially in fixed income products;\textsuperscript{492} an ever-expanding


\textsuperscript{491}See BLACKROCK, The ETF Network Effect, https://www.blackrock.com/americas-offshore/insights/etf-growth (last visited November 4, 2019) (“Four trends will fuel future ETF growth, especially in the U.S. and Europe: Portfolio construction preferences are shifting with the recognition that management fees have significant impact on long-term returns. Use of low-cost, index-based ETFs as core positions is likely to grow with ETFs increasingly used as building blocks in asset allocation and as vehicles to deliver factor-based investment strategies. A transformation in the business model for financial advice is under way in the U.S. and will soon begin in Europe. ETFs are positioned to be prime beneficiaries of this secular transition, since financial advisors and wealth managers will have incentives to place low-cost ETFs at the heart of portfolios. Bond trading is evolving. The liquidity that many institutions once took for granted is evaporating. To facilitate large transactions, investors are increasingly likely to use bond ETFs alongside single securities. ETF market scale and product standardization will reinforce adoption. As more investors participate, and the market expands, ETFs become more efficient to trade and cheaper to own. The network effect will accelerate future ETF adoption by investors big and small.”)

\textsuperscript{492}See ESRB Report, supra note 490 at 4, footnote 2 (“The passive nature of ETFs in that they constitute investments in fixed-income products may in principle create a moral hazard problem in the issuance of such products: anticipating that they will be bought by ETFs, bond underwriters may forgo due diligence on such instruments, as was the case in the originate-to-distribute business model before the global financial crisis.”); see also A. Puranandam, Originate-to-distribute model and the subprime mortgage crisis, 24(6) REVIEW OF FINANCIAL STUDIES, 1881-1915 (2011).
choice of products including “thematic” styles,\textsuperscript{493} and a growing dominance of mega-ETF issuer firms like BlackRock, Vanguard and State Street.\textsuperscript{494}

The ETF ecosystem provides a powerful case study of the financial market’s continual evolution in technology and speed. These products are commonly promoted by algorithmic wealth management platforms (robo-advisors)\textsuperscript{495} and also embraced by high frequency traders (HFT) who profit by providing daily liquidity and market making (MM) activity.\textsuperscript{496} Yet an in-depth investigation of the complex ETF operating ecosystem reveals layers of interconnected relationships amongst product creators, intermediating participants (including MMs and HFT), as well as retail and institutional investors.\textsuperscript{497}

Given this operational complexity, the risks in ETFs aren’t well understood, and they emanate from how intermediaries interact in this ecosystem.\textsuperscript{498} This study’s first article described how intermediary interaction in ETFs has the potential to create liquidity “illusions” that could prove fragile in a crisis if participants pursue discretionary incentives.\textsuperscript{499} It also highlighted, using examples from 1987’s “Black Monday” crash,\textsuperscript{500} and the GFC,\textsuperscript{501} that

\textsuperscript{493}The ever-expanding menu of ETF choices also includes “virtue signals” and “trends” including religion, veganism and marijuana. See Jennifer Thompson, \textit{Virtue Signaling ETFs: Religion, Veganism and Marijuana Used To Tap Trends}, FINANCIAL TIMES (July 28, 2019), https://www.ft.com/content/7d4147e2-9e2e-11e9-b8ce-8b459ed04726; see also Hu & Morley, \textit{A Regulatory Framework}, supra note 1 at 843.

\textsuperscript{494} See Su, supra note 485 at 16. (“The top three ETF sponsors (also known as asset managers or issuers)—BlackRock (40%), Vanguard (25%), and State Street (18%)—account for around 83% of U.S. ETF market share.”); see also Lucian A. Bebchuck & Scott Hirst, \textit{The Specter of the Giant Three}, NATIONAL BUREAU OF ECONOMIC RESEARCH WORKING PAPER NO. 25914 (June 2019), available at https://www.nber.org/papers/w25914.


\textsuperscript{497} See Su, supra note 1 at 2-7; see also Hu & Morley, \textit{A Regulatory Framework}, supra note 1 at 851-856; Hu & Morley, \textit{A Welcome Invitation}, supra note 1 at 1157-1162.

\textsuperscript{498} See Ryan Clements, \textit{New Funds, Familiar Fears: Are Exchange Traded Funds Making Markets Less Stable? Part I – Liquidity Illusions}, 20 HOU. BUS. & TAX. L. J 14 (2020); also Hu & Morley, \textit{A Regulatory Framework}, supra note 485 at 847 (“The arbitrage mechanism and its effectiveness vary among ETFs, depending on, among other things, the assets an ETF holds. Irrespective of particulars, every arbitrary mechanism embodies a theoretical model hypothesizing the voluntary behavior of APs and other market participants in a variety of circumstances. Like all models, this model depends on assumptions and suffers from “model risk” – the risk that the model may be faulty.”)

\textsuperscript{499} Id. at 15-19.

\textsuperscript{500} Id. at 29-33.

\textsuperscript{501} Id. at 33-35.
relying on financial intermediaries to provide discretionary liquidity to investors, and price stabilizing arbitrage intervention, mid-crisis is not certain.\footnote{Not only is reliance on arbitrage potentially fragile in a crisis, but there are inherent “costs” and “limits” to undertaking any form of arbitrage activity, especially during a crisis. See Andrei Shleifer & Robert W. Vishny, \textit{The Limits of Arbitrage}, 52(1) \textit{THE JOURNAL OF FINANCE} 35, 38 (1997) (“We show that performance-based arbitrage is particularly ineffective in extreme circumstances, where prices are significantly out of line and arbitrageurs are fully invested. In these circumstances, arbitrageurs might bail out of the market when their participation is most needed.”); \textit{see also} Hu & Morley, \textit{A Welcome Invitation, supra} note 485 at 1196.}

This article compliments its predecessor and argues that two “interaction risks” originate from the ETF ecosystem. First, ETFs have the potential to contribute to collective investor behaviors including the formation of information cascades, investor herds, and contagion.\footnote{\textit{See infra, Section III.}} Second, ETFs, together with other exchange traded products (ETPs) and the ever-expanding menu of available index based mutual and closed-end funds, given the increasing demand for such products by both retail and institutional investors alike, may be distorting the prices of underlying assets, making markets less informationally efficient, and disincentivizing price discovery.\footnote{\textit{See infra, Section IV.}} Given these risks - and the strong interest by retail investors, pensions and institutions – heightened regulatory, investor, and academic attention should be directed to indexing (and ETFs in particular) to better understand the budding consequences of this post-crisis growth, and ensure mitigating safeguards are established against emerging instabilities.\footnote{\textit{See infra, Section V.}}

The first section of this article outlines how ETF’s could contribute to information cascades, investor herds, and contagion. It defines the concept of “concentration risk” as applied to ETF ecosystem intermediaries like authorized
participants (AP),

and fund sponsors;

and shows how the failure
of a prominent intermediary could trigger an investor run.

This section also
shows how cascade selling could arise from independent profit-seeking actions
of APs (for example when using “operational shorting” strategies),
and also occur as a result of interactions between ETF secondary market trading, and sales
of underlying assets.

This section also notes the impact of robo-advisors and
HTF on information cascades and investor herding in ETFs.

The article’s second section argues that complex interactions in the ETF
ecosystem could be contributing to financial markets becoming less
informationally efficient, and disincentivizing active price discovery.
This section outlines how prices of underlying ETF assets and securities might be
artificially inflated by demand from index investors who aren’t engaging in
active price discovery (a contention supported by several prominent investors);
and that the true value of index securities might also be distorted by noise
transmission coming from intermediating participants (primarily HFT) in the
ETF operational ecosystem.

To support this contention it reviews and
summarizes empirical evidence from several recent studies showing price and
liquidity co-movement in securities that comprise ETF indices.
It also
highlights how ETFs could be contributing to more volatile markets.

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506 See Clements, supra note 498 at 38-42; See also Rochelle Antoniewicz & Jane Heinrichs,

507 See Clements, supra note 498 at 38-42.

508 See Su, supra note 485 at 16.

509 See infra, Section III(c).

510 See infra, Section III(g); see also Hu & Morley, A Welcome Invitation, supra note 1 at 1195-1196.

511 See infra, Section III(e) & (g).

512 See infra, Section II(f).

513 See infra, Section IV.

514 See infra, Section IV (a) - (c).

515 Id.

516 See infra, Section IV(d).
The article provides a unique contribution to the literature on systemic risk and financial crises by illustrating how information cascades, investor herds, and informational and price inefficiencies were also present in the lead up to, and during, the GFC, as well as in post-GFC “flash crashes.” Specifically, information cascades and investor herds were evidenced in the demand for mortgage-backed securities (MBS), the run on Lehman Brothers in the wholesale funding market, and the herding behavior which was prominent in the auction rate securities (ARS) market failure in the GFC.

The GFC provides a tragic lesson on how complexity in financial product innovation, and non-linear responses due to intermediary interconnectedness, can decrease the efficiency of information in financial markets. When this happens material, and catastrophic risks, build up and go unnoticed until the market crashes. This was evidenced by the “informationally insensitive” market in the lead up to Lehman’s failure, and in the overlooked risks in the MBS market during the subprime lending boom. A growing body of empirical evidence, as this article will present, supports the proposition that ETFs are also contributing to a less efficient market. This is a development that should be taken very seriously by regulators, academics, and investors of all stripes and the concluding section will identify specific areas where heightened research attention is warranted.

iii. Could ETFs Facilitate Investor Herding?

a. Herding, Information Cascades and Crowd-Panic in Financial Markets

Best-selling author, and former bond trader, Michael Lewis has widely documented investor herding and crowd mania in his book *Panic! The Story Of*...
Modern Financial Insanity, including the “Black Monday” stock market crash of 1987, the East-Asian financial crisis in the 1990s, the dot.com boom, and the GFC. Professors Ian Ayres and Joshua Mitts posit that herding increases systemic risk and negatively impacts the “production of information” and that “mimicry” in the marketplace (especially during a financial panic) can generate “disabling information cascades.” These cascades cause investors to follow other’s behaviors over more effective information “signals” (which Ayers and Mitts define as the “subjective probability regarding the payoff of a particular action, transaction, or contractual term.”)

An information cascade can occur “when people form beliefs based upon the belief or opinion of others” even if the latter isn’t true. Professor Jonathan R. Macey & James P. Holdcroft Jr. describe it as “when a market participant can easily observe the behavior of those around him and follows the behavior of the other market participants without regard to his or her own information, beliefs, or the views of the market.” In other words, as articulated by Professor Seth Oranburg, information cascades are market “group think” where “even rational individuals will choose to abandon their private information (or not make efforts to gather information in the first place) and instead follow the crowd.”

Professor Steven Schwarcz suggests such events create a “sequential ordering” and investor actions (like selling a particular asset class) are observed as being made with “better information.” This can set off a “chain reaction” of group behavior – also described by Professors Bryan Druzin and Jessica Li as

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524 Id. at 20-78.
525 Id. at 79-161.
526 Id. at 162-263.
527 Id. at 283-366.
529 Id. at 4.
530 Id. at 18; see also Sushil Bikhchandani, David Hirshleifer & Ivo Welch, A Theory of Fads, Fashion, Custom, and Cultural Change as Informational Cascades, 100 J. Pol. Econ. 992 (1992); Sushil Bikhchandani, David Hirshleifer & Ivo Welch, Learning from the Behavior of Others: Conformity, Fads, and Informational Cascades, 12 J. Econ. Persp. 151 (1998).
531 Bryan Druzin & Jessica Li, Censorship’s Fragile Grip on The Internet: Can Online Speech Be Controlled, 49 Cornell Int’l L.J. 369, 387-88 (2016).
532 Seth C. Oranburg, A Place Of Their Own: Crowds In The New Market For Equity Crowdfunding, 100 Minn. L. Rev. Headnotes 147, 152 (2016).
“the fragility of mass behaviors” which can also produce a “procyclical” effect. 535 Professor Robert Hockett calls this a “recursive collective action problem,”536 and notes that many “familiar regulatory and policy challenges” in financial markets “constitute instances of this general phenomenon.”537

b. Herding and Information Cascades During and After the Global Financial Crisis

Early in the GFC, Professor Cass Sunstein warned about herding and information cascades (which he called a “lemmings” problem), and suggested that psychology was just as important as economics in calculating a regulatory response.538 Sunstein identified numerous cascades where individual’s actions seemed to be largely influenced by the judgments of others, not just by their own “private information” and analysis.539 The net result was a great number of people making bad decisions (a “social contagion”) including the pre-GFC axiom that real estate prices always increased over time, and the pessimism that stocks were inherently risky, leading to wide selling and price destabilization.540 Professor Steven Schwarcz has argued that another example of herding behavior and information cascades in the GFC was the “frenzied worldwide demand” for MBS,541 which was driven by “a misleading information cascade about the value of such MBS.”542

Evidence of herding in sophisticated commercial and investment banks during the GFC has also been recently documented.543 The GFC also showed how quickly (onset by information cascades) panicked selling led to a financial contagion across global markets.544 Investor runs on liquidity created “self-

535 Druzin & Li, supra note 531 at 387. A “procyclical” effect is where the behaviors of the crowd cause the initial fallout from the crisis to become worse.
537 Id. at 1.
539 Id.
540 Id.
541 See Schwarcz, Complacency supra note 534 at 1078.
542 Id; see also Brett McDonnell, Don’t Panic! Defending Cowardly Interventions During and After A Financial Crisis, 116 PENN. ST. L. REV. 1 (2011).
544 See Steven B. Kamin & Laurie Pounder DeMarco, How Did A Domestic Housing Slump Turn Into A Global Financial Crisis, BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM INTERNATIONAL FINANCE DISCUSSION PAPERS 994 (January 2010); also OXFORD ANALYTICA, U.S. Financial Crisis Goes Global, FORBES (September 22, 2008),
fulfilling panics” which caused a nearly simultaneous intermediary “coordination failure” in the ARS market. A Federal Reserve Board working study on the ARS market noted that “coordination failures triggered by an unexpected first mover caused all major broker-dealers to simultaneously withdraw their liquidity support.”

World Bank researchers have also noted that wholesale funding markets were another area affected by the cascade because banks, which relied on “non-deposit” funding sources were adversely exposed to “liquidity crunches” when wholesale funding markets simultaneously froze after the bankruptcy of Lehman Brothers. Wholesale funding, including commercial paper, repos and interbank loans, provide banks with a “non-depositary” source of short-term financing; and liquidity in the wholesale funding market experienced a “sharp and widespread collapse” in September 2008 following Lehman’s bankruptcy filing. Observers reported that “access to wholesale funding evaporated in a matter of days, if not hours.”

Another instructive aspect of the GFC, for the purposes of evaluating risks in ETFs, is that interaction effects between financial intermediaries likely exacerbated the crisis fallout. Professor Markus Brunnermeier has argued that securitization in the GFC “led to an opaque web of interconnected obligations” and drove “several amplification mechanisms” and “network effects” when financial institutions acted in dual roles as lenders and borrowers. Although ETF intermediaries don’t act as lenders and borrowers, some have dual roles as ETF arbitrageurs and underlying asset managers or dealers. Herding didn’t

546 Id. at 25.
547 See Claudio Raddatz, When The Rivers Run Dry: Liquidity and the Use of Wholesale Funds in the Transmission of the U.S. Subprime Crisis, WORLD BANK POLICY RESEARCH WORKING PAPER 5203 (February 2010).
548 See id. at 7.
549 Id. at 2.
550 Id. at 3.
552 Id.
553 Id. at 96-97.
554 See Kevin Pan and Yao Zeng, ETF Arbitrage Under Liquidity Mismatch, FOURTH ANNUAL CONFERENCE ON FINANCIAL MARKET REGULATION, 3 (June 28, 2017) available at https://ssrn.com/abstract=2895478 or http://dx.doi.org/10.2139/ssrn.2895478; see also Hu & Morley, A Welcome Invitation, supra note 485 at 1195-1196.

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end with the GFC. Recent empirical evidence has also identified herding in the “flash crash” of May 2010. In this study, intraday S&P 500 price data was used to show that “market herding” started right before the crash and remained during, and into its aftermath, and that there was a “clear link” between herding, flash events and “sudden price fluctuations.”

c. How Could ETFs Contribute to Investor Herd Formation?

An ETF is a collective investment vehicle that gains “market exposure at lower fees.” ETFs, like index mutual funds, are a “momentum strategy” and underlying assets are purchased when ETF investor money “flows in” and underlying assets are sold when investor money “flows out.” Investor demand for ETFs, and other “passive investing” products may be creating “artificial popularity” for assets comprising an index, or representative basket, during inflow periods (and a potential bottleneck of future risk that could be unleashed during a market sell-off).

Given the nascent surge in passive investing, a bear market sell-off in ETFs could facilitate an investor “stampede” in the underlying market, with too few active arbitrageurs (who may be unreliable during a crisis) to stabilize the market by purchasing undervalued underlying assets. This potential was ominously identified by the late John Bogle (founder of Vanguard, and perhaps one of the most important people in the history of ETFs and passive investing) who noted before his death that “[if] everyone indexed, the only word you could use is chaos, catastrophe. The markets would fail.”

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556 Id. at 6.
557 David Thomas, A Warning From The Late John Bogle, FORBES (February 12, 2019), https://www.forbes.com/sites/greatspeculations/2019/02/12/a-warning-from-the-late-john-bogle/#6c00a7d62b99.
558 Id.; To further understanding the relationships between demand for ETFs and the purchasing of underlying assets, see Clements, supra note 498 at 38-41.
560 Thomas, supra note 557; see also Clements, supra note 498 at 29-35; see also Hu & Morley, A Regulatory Framework, supra note 485 at 851-856; Hu & Morley, A Welcome Invitation, supra note 485 at 1157-1162.
561 Thomas, supra note 557.
Another potential ETF information cascade, with investor herding potential, is related to the “concentration” of ETF issuers, financial intermediaries (like APs and MMs) and swap counterparties (for synthetic ETFs). The ETF market has a small number of large fund issuers. The European Systemic Risk Board, in a June 2019 report (the “ESRB Report”), posited that if a large ETF fund issuer had an “operational” disruption or a serious case of fraud or “financial misconduct” then trust in the market could quickly evaporate leading to an ETF contagion sell-off in a herding pattern. Also, as noted recently by Ireland’s Central Bank, a “stress event” affecting a large AP could have a material ripple effect throughout the ETF market. If consolidation occurs in MM or AP firms, it could exacerbate the potential for herding, and first-mover influence, while reducing the number of available APs who could step in to correct mispricing and liquidity shortages, since liquidity is inherently “fragile” during a crisis.

The Central Bank of Ireland has also posited that dealers and MMs will stop providing liquidity once they start incurring losses, or their balance sheets are negatively impacted from other exposures, and they can no longer bear the additional risk from providing the liquidity support. ETFs are administratively cheap and they may not have a “great tolerance for liquidity risk.” Also, active funds that hold ETFs in their portfolio might sell with the herd, since as Professor Steven Schwarcz identifies, active managers often won’t contest the crowd because of the costs of being “wrong.”

562 See ESRB Report, supra note 490 at 3.
563 Id. at 16, 30.
564 See Su supra note 485 at 1; see also Bebchuck & Hirst, supra note 494.
565 ESRB Report, supra note 490 at 31.
567 There is some evidence that the market for AP ETF arbitrage is, however, growing more robust with additional competition; see Siobhan Riding, Watchdogs Probe Systemic Risks of Passive Fund Growth, FINANCIAL TIMES (March 31, 2019), https://www.ft.com/content/a1deabc2-3eab-11e9-9499-290979c9807a.
569 See CBI Feedback Statement, supra note 566.
570 See id. at 47-48.
Professors Ayan Bhattacharya and Maureen O’Hara have posited, in a recent working paper, based on a “tractable model of ETF trading” the potential for “fragility via herding” in ETFs through “inter-market information linkages.” Specifically, the authors identify a potential “tail wagging the dog” phenomenon since ETF market volatility impacts the price volatility of the underlying assets “even when such information is irrelevant for a particular underlying asset.” The authors further identify that MMs in an underlying asset, when interpreting price data in ETFs “cannot perfectly distinguish between price changes caused by factors pertinent to his asset, and other factors irrelevant to him.” This creates market instability. The potential for herding noted by these authors emerges when MMs cannot “synchronize” the ETF and underlying asset prices (through arbitrage and speculators start trading in unison (based on the “systematic factor signal” which is “unhinged” from asset price information.

As identified by Professors Henry Hu and John Morley, in their study advocating for the first “single regulatory framework” for ETFs in the U.S., the ETF “arbitrage mechanism” temporarily failed in February 2018, resulting in coordinated MM movements, decreased liquidity, and deviations between ETF prices and their net asset value (NAV) when Inverse VIX products traded at 18 times their NAV. Also, during the May 2010 flash crash, and again in August 2015, ETFs which held long exposure to U.S. domestic equities suffered an arbitrage breakdown with similar mischief.

If the ETF market continues to grow (a highly probable outcome) it could fail again and thus regulatory developments like the unified regime proposed by Professors Hu and Morley, requiring enhanced “qualitative” and “quantitative” assessments for the ETF “arbitrage mechanism,” are necessary to

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573 Id. at 37.
574 Id. at 5.
575 Id. at 3.
576 The authors define “systematic factor signal” as a situation where a “short-horizon equilibrium involves all speculators trading on the same signal.” See id. at 27.
577 Id. at 7.
579 Hu and Morley, A Regulatory Framework, supra note 485 at 846, 855-863; see also Hu & Morley, A Commendable Start, supra note 485 at 1175.
580 See Bebchuck & Hirst, supra note 494.
consider (the author’s suggest disclosures analogous to a “management discussion & analysis” (MD&A) for a specific fund’s “arbitrage mechanism”). Another regulatory reform that has been canvassed, if the AP ETF arbitrage breaks down, would be to open primary market access to holders of ETF shares who obtain them in the secondary market (like retail investors) - a proposition beset, however, with practical complexities.

The ESRB Report also identified the possibility for “procyclical” market movements influenced by complex ETFs, like those utilizing leverage and “rule-based trading strategies.” The ESRB Report notes how a “decoupling” of the ETF arbitrage function (the focus of the first article in this study) could lead to a coordinated “fire sale” as investors en-mass “lose faith” in the ETF operational ecosystem and look to liquidate positions. Further, the popularity of certain ETF structures leads to investors having much greater “correlated exposures” than ever before and this could lead to a “chain reaction” in financial markets.

d. The Rise of the Passive Investor

It’s been estimated that since 2009, passive equity investments (not including fixed-income baskets) have increased by more than $2.5 trillion, and during this time period, over $2.0 trillion has been withdrawn from actively managed funds. It appears that “passive investing” has eclipsed active management (one reporter recently called it the “passive singularity.”)

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581 Hu and Morley, A Regulatory Framework, supra note 485 at 849; see also Hu & Morley, A Commendable Start, supra note 485 at 1159-1161.
583 See ESRB Report, supra note 490 at 2.
584 See Clements, supra note 498.
586 See ESRB Report, supra note 490 at 3, 18.
growth of passive investments, like ETFs but also including index mutual funds and closed-end structures, has not been universally embraced, and Warren Buffett’s famous quote of “weapons of financial mass destruction” (describing the destabilizing impact of derivatives in financial markets) has also been recently levied at ETFs because of how investors can “blindly purchase” these products “without any regard to valuation” thus leading to a more inefficient market.589

Economists (and Nobel prize laureates) George Akerlof and Robert Shiller in their book, Animal Spirits: How Human Psychology Drives the Economy, and Why It Matters For Global Capitalism, have detailed the variability (and “arbitrariness”) of individual investment decisions because of what they call “animal spirits” – or a human tendency towards irrationality.590 Even through savings are a necessary condition for long-term individual welfare,591 and national prosperity,592 the authors contend (citing research from Richard Thaler, Hersh Shefrin, and Martin Feldstein, among others) that “[p]eople have a hard time knowing what to save” and that a “deer-in-the-headlights” phenomenon can often be seen in investment decisions.593 An ETF appears to relieve this perplexity by facilitating a simple “buy the market” dynamic thus reducing decision-making friction.

Some industry participants believe, however, that passive investing isn’t “benign” at all, but should be equated with a form of inefficient centrally planned “Marxist economy” and that active investment performs an important “social function” in terms of asset allocation, environmental and “social governance.”594 Also, it’s been suggested that the number of indexes and passive products have grown so large that it requires an “active decision” (and the reliance on “model portfolios and robo-advisers”) to know which one to invest in.595 The rise of passive investment has also been attributed to a post-GFC period of “liquidity

591 See id. at 123-124.
592 See id. at 125-127.
593 Id. at 119-120.
595 Burger, supra note 588.
and loose monetary policy” that has arguably driven asset value inflation.\textsuperscript{596}
Related to this is the contentious (and unsettled) debate on the social utility, and deleterious impact of “common ownership”\textsuperscript{597} by index-based funds like ETFs on consumer prices, competition, shareholder engagement and executive compensation.\textsuperscript{598}

e. Collective Ownership, Firm Incentives and Herd Formation

One particularly concerning by-product of passive investing is the effect that it may be having on firm incentives.\textsuperscript{599} Recent economic research suggests, ironically, that firms that have “overlapping sets of investors” have a perverse incentive to “distort competitive behavior, affecting pricing, entry, contracting

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\textsuperscript{597} See BLACKROCK, \textit{Index Investing and Common Ownership Theories}, VIEWPOINT (March 2017), 1, available at https://www.blackrock.com/corporate/literature/whitepaper/viewpoint-index-investing-and-common-ownership-theories-eng-march.pdf. (Common ownership is defined by BlackRock as “owners that hold shares of several companies in an industry, including asset managers acting on their behalf.”)

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and virtually all strategic interactions among firms. In other words, firms with the same owners may have less incentive to compete, and while they may not be engaging in anti-competitive behavior directly (as legally defined), their “reward-systems” are being re-aligned for collusion, not strong competition. This could also influence herds as “investors in firms become more similar to each other over time.” Surprisingly, the referenced study also notes that this trend pre-dates the success of BlackRock and Vanguard. The result has been described as transforming the entire S&P 500 into “one gigantic company.”

Other passive investment critics have noted how these investments can “impede” good corporate governance and the efficiency of markets. As suggested recently by one financial markets commentator, “[i]ndex funds are disincentivized from expending resources on improving the performance and corporate governance of the companies in which they invest” because this would increase fund management costs, and thus ETFs lead to “large blocks of stock held by disinterested holders” which can “determine the outcome of corporate elections, and create a voting dead weight.” One potential solution suggested by this commentator would be a system of “pro rata voting.”

In response to the growing problem of block shares held by passive index funds, disincentivized from expending resources to enhance corporate governance, the SEC recently announced an initiative to study the proxy voting process including the role that fund ownership plays in shareholder voting and corporate governance. SEC Chairman Jay Clayton, in recent remarks to

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601 See Kawa supra note 599.
602 Id.
603 See Backus et al., supra note 600.
604 Kawa, supra note 599.
606 Id.
607 Maurice M. Leikort, A Proposed Solution To The Index Fund Free Rider Problem, WHARTON MAGAZINE (June 8, 2018), http://whartonmagazine.com/blogs/a-proposed-solution-to-the-index-fund-free-rider-problem/#sthash.mlouON6A.1Yuxvwmz.dpbs.
the SEC Advisory Committee, noted the importance of reviewing passive investment growth including concentration risk, proxy considerations and “questions about how passive funds should approach engagement with companies on the one hand and engagement with their investors on the other hand.”

The interaction of market intermediaries, and an expanding investor base for ETFs including institutional, retail, algorithmic, and HFT, with diverse investment goals and preferences, may also facilitate an “interaction risk” which can undermine market efficiency and information synthesis. Professor Benoit Mandelbrot (father of fractal geometry), together with Richard L. Hudson, has argued against the orthodox view of efficient markets, noting historical evidence of investor irrationality and non-continuous price changes. They note that “non-homogenous” investor interactions yield unexpected price movements, price bubbles and crashes. Also, citing research from economists Paul De Grauwe and Marianna Grimaldi, they suggest that with multiple investor class interactions “[t]he market switches from a well-behaved ‘linear’ system in which one factor adds predictably to the next, to a chaotic ‘non-linear’ system in which factors interact and yield the unanticipated.”

f. The Impact of High Frequency Trading and Robo-Advisors on ETF Herd Formation

Because of high secondary market liquidity, ETFs have attracted a variety of short-term, directional, and algorithmic traders, and become a preferred vehicle for HFT. HFT undoubtedly provides liquidity for ETFs;
however, the nature of their contribution to the ETF market ecosystem is debatable. The algorithms that power HFT have “similar assumptions” and as a result they may react in a crisis as Professor Hillary Allen notes, “in a herd-like fashion.” HFT has been criticized as being “active and aggressive traders, committing fratricide when it suits them, or withdrawing altogether from volatile markets.” So ETFs create an environment where “micro-efficient behavior” (the actions of individual algorithmic trading platforms reacting to market conditions) could “exacerbate pro-cyclical action” when similarly programmed entities act in unison.

HFT legitimate market making can also tread dangerously close to “market manipulation” and “scalping.” Market participants have also expressed recent concerns that HFT sourced liquidity could vanish in a crisis. A theory cited as circulating Goldman Sachs’ trading desks is that HFT provides liquidity “without taking into account fundamental information” and as such they could withdraw this liquidity in periods of market stress “to avoid being adversely selected.”

One of the few test cases for ETF herding in a crisis, and the interaction effects of HFT, occurred in a mini-flash crash in February 2018 during a sell-off of volatility tracking exchange traded products (ETP). On February 5, 2018


623 Id.

the CBOE Volatility Index (VIX) experienced its largest single day jump (115%) followed by a dramatic sell-off of inverse VIX exposure ETPs (products that gave investors a return opposite to the movement of the VIX by shorting VIX futures). The losses on inverse VIX products were massive (estimated at over $3 billion) and the media reaction was quick and negative. Influential investors suggested the products were increasing financial instability (Carl Icahn called them a “casino on steroids” and Devesh Shah, the inventor of the VIX noted “in my wildest imagination I don’t know why these products exist.”)

The episode was, however, an interesting “stress test,” on ETF arbitrage functionality in the context of potential intermediary herding. Further, it distinguishes ETFs from their more complex ETP relatives (like VIX products), since ETFs on the S&P 500 exhibited “relatively tight tracking and bid-ask spreads”, a “minimal impact” on underlying U.S. stocks and orderly trading in fixed income ETFs. BlackRock has cited this experience as indicative of the ETF ecosystem’s dependability in a crisis scenario.

Numerous digital wealth management platforms (called “robo-advisers”) have emerged, post-GFC, providing investment recommendations, and other portfolio management services to clients using data-synthesizing algorithms that interpret factors like age, risk tolerance, and financial goals. Robo-advisers are growing in popularity since they serve clients who, because

626 BlackRock ETF Case Study, supra note 625.
630 BlackRock ETF Case Study, supra note 625 at 1.
631 Id at 4.
632 Id. at 5.
633 See id.
634 See, for example, BETTERMENT, https://www.betterment.com/ (last visited September 9, 2019); see also NUTMEG, https://www.nutmeg.com/ (last visited September 9, 2019).
of factors such as geographic location or income, are unable to obtain sophisticated investment management services. These artificial intelligence driven innovations can also help remedy traditional investor shortcomings like irrational investor tendencies and biases.

ETFs form the foundation of many portfolios constructed by robo-advisers. There are concerns that correlated advice from robo-advisors may exacerbate herding as AI-driven investment recommendations facilitate a “pile into” hot ETFs, and create a coordinated exit “stampede” in a crisis. This particular risk has attracted the attention of high profile regulators - like Mark Carney, Governor of the Bank of England, who has warned publicly that the rise of robo-advisers has a potential for “excess volatility or increase pro-cyclicality as a result of herding.” The Organization For Economic Cooperation and Development (OECD) has also cited robo-advisers’ use of ETFs as a potential systemic, and “pro-cyclical,” stability risk. Further, hedge fund CEO Jeffrey Gundlach has publicly decried what he calls a passive investing “mania”, and iterated the herding dangers with broad equity ETFs and their inclusion by robo-advisors.

**g. Contagion and Spillover Effects from ETF Investor Herd Behavior**

Investor herding, in an ETF selloff, could also lead to panicked selling of other asset classes - a phenomenon in financial markets called “contagion.” If investors of certain ETF fund strategies (like fixed income) experience collective

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636 See id.
640 Judge, supra note 638.
642 See OECD, supra note 641 at 15-16.
liquidity shortages, during a crisis or market sell-off, there is an additional risk of contagion or “spillover” to different ETF types, and even underlying asset classes, as investors, who are holding illiquid ETFs will be “forced into selling other assets, spreading the pricing and liquidity pressure across the financial system.”

This is also known as a “feedback loop” and has generated a significant amount of recent debate between the asset management industry, academics and regulators. The ESRB Report notes that ETFs are often utilized by financial institutions as cash substitutes in their liquidity management systems, and a shock to the ETF market could transmit shocks throughout the greater financial system if large financial institutions doubt this cash substitutability, and look to simultaneously liquidate their ETF holdings. The International Monetary Fund (IMF) has also recently identified contagion risk as potentially stemming from ETF market activity.

Empirical research has also linked the ETF arbitrage process with contagion risk, identifying it as “an unintended consequence of arbitrage and a

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645 See S. Malamud, S., A dynamic equilibrium model of ETFs, CEPR DISCUSSION PAPER SERIES, NO DP11469 (2016); see also Hu & Morley, A Regulatory Framework, supra note 1 at 915.
646 See Su, supra note 485 at 11; see also Hu & Morley, A Regulatory Framework, supra note 485 at 915.
649 See INTERNATIONAL MONETARY FUND, OUTLOOK FOR FINANCIAL STABILITY, 19-20 (April 2018), available at http://www.imf.org/en/Publications/GFSR/Issues/2018/04/02/GLOBAL-Financial-Stability-Report-April-2018. The IMF notes risks in bond ETFs with reduced underlying liquidity based on several parameters including: “frequent trading” with often higher turnover and more volatility in ETF shares than the shares of underlying assets; ETF “sensitivity to changes in risky asset prices” which can lead to contagion risk and “possibly amplify price moves across asset markets during periods of stress”; and also the potential for greater “cross-asset correlation” due to the rise of passive investing as a dominant investment strategy (see discussion at 19-20).
yet-unexplored outcome of financial innovation.” In a study by Professors Itzhak Ben-David, Francesco Franzoni and Rabih Moussawi, ETF arbitrage was evidenced as weakening (leading to “ETF mispricing” or “decoupling” between the fund NAV and the ETF trading price) when providing liquidity became less profitable for intermediaries, and also during periods of “poor stock market returns and poor returns for the financial sector.” ETF arbitrage was shown in this study to “facilitate the propagation of liquidity shocks from the ETFs to the underlying securities.” However, the propagated shocks are not due to an “information-based change in prices” (in other words they are “non-fundamental shocks”) and the authors suggest they “increase the risk of contagion across access classes.”

Another discovered source of contagion risk in ETFs is in “operational shorting” (OS) by MMs (including APs). In a recent University of Virginia, Darden Business School, working paper, researchers defined OS as a scenario where, “the AP sells ETF shares but postpones their creation and delivery, which delay is effectively a form of short-selling. The AP owes or is short the ETF shares until they ultimately deliver those shares to the investor who purchased them in the secondary market.” The ability for APs to “sell new ETF shares that are not yet created” derives from an SEC delivery requirement exemption for market making activities (Rule 204), and the “flexibility of the multi-day settlement window.” Further, the study notes that OS activity is “driven by” ETF liquidity mismatch in the underlying assets and the “presence of efficient hedges.” While OS may serve as a “contrarian form of liquidity provision,” and may also enhance price discovery, it can generate higher “failures to deliver” (FTD) which “spillover from one ETF to another within the same AP,

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650 See Itzhak Ben-David, Francesco Franzoni & Rabih Moussawi, ETFs, Arbitrage and Contagion, NATIONAL CENTER OF COMPETENCE IN RESEARCH FINANCIAL VALUATION AND RISK MANAGEMENT WORKING PAPER NO. 793 (July 2012) at 3.
651 Id.
652 Id. at 4.
653 Id. at 4-5; see also discussion at 30.
655 Id. at 2.
656 See id discussion at 22; see also A. Jain, and Jain C., Fails-to-Deliver before and after the implementation of Rule 203 and Rule 204, 50 FINANCIAL REVIEW 611, 611-636 (2015).
657 Evans et al. supra note 170 at 2.
658 Id. at 35.
659 A “failure to deliver” in a short-position occurs when the party with the short position “does not own the underlying assets and so cannot make the delivery” see INVESTOPEDIA, Failure to
and from one AP to another, because these firms make markets for ETFs with similar underlying securities.

Related research from George Mason University has shown that FTDs in the ETF market are correlated with increased volatility and are also not random, but rather motivated by MMs attempting to by-pass the “borrowing costs” affiliated with their shorts. The contagion dynamic in OS is exhibited through the “commonality” in MMs engaging in similar strategies and the existence of “positively correlated trading strategies” amongst MMs following the behavior of “lead” MMs (usually large APs) to engage in OS. The authors conclude that any liquidity enhancements of OP by ETF MMs “does so at the cost of greater inter-connection within and between APs, an effect magnified by financial leverage.”

iv. Could ETFs Be Contributing To Markets Becoming Less Efficient?

a. The Growing Complexity of the ETF Ecosystem

Financial market complexity has been described by Professor Steven Schwarcz as the “greatest financial market challenge of the future.” The more complex markets are, “the greater the chance of the unexpected interaction of components.” Over the last fifty years, financial markets, and available products (including ETFs) in the U.S., have grown tremendously in size, diversity and complexity. The complexification of ETFs continues nearly unabated, and “active” ETFs will shortly be launched in the U.S. with even less transparency (providing quarterly as opposed to daily positional disclosure), an

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* Evans et al. supra note 654 at 36.
* Id.; see also discussion at 6.
* Id. at 6.
* Id. at 6.
idea that at first glance seem antithetical to the underlying ethos of securities regulation.\footnote{See Justin Baer, The Next Big Thing in ETFs: Less Transparency, THE WALL STREET JOURNAL (July 13, 2019), https://www.wsj.com/articles/the-next-big-thing-in-etfs-less-transparency-11563010201; see also Hu & Morley, A Welcome Invitation, supra note 1 at 1184-1186.}

Professor Saule Omarova has described financial product growth as characterized by two unifying factors, both of which are exhibited prominently in the ETF market: the “synthesizing” of economic interests and the “scaling up” of transaction volume and speed.\footnote{See Saule T. Omarova, New Tech v. New Deal: Fintech As A Systemic Phenomenon, 36 YALE JOURNAL ON REGULATION 735, 741 (2019).} She notes that these unifying factors are driven by four increasingly common financial market “mechanisms”: pooling,\footnote{See id. at 762.} layering,\footnote{See id. at 763.} acceleration,\footnote{See id. at 764.} and compression.\footnote{See id. at 765.} The application of these mechanisms are evident in ETF innovation. Consider the wide slate of funds currently offered by Vanguard\footnote{See VANGUARD ETFs, https://investor.vanguard.com/etf/list/#/etf/asset-class/month-end-returns (last visited September 9, 2019).} – securities of many varieties are pooled into tradeable ETFs, layered by risk classification, accelerated through algorithmic trading mechanisms, and compressed through modern trade settlement dynamics.\footnote{See Omarova New Tech, supra note 668 at 765-767.}

As a result of this evolution, a tradable financial instrument represents nearly every real economic interest.\footnote{See generally Servaas Storm, Financial Markets Have Taken Over The Economy. To Prevent Another Crisis, They Must Be Brought To Heel, INSTITUTE FOR NEW ECONOMIC THINKING (February 13, 2018), https://www.ineteconomics.org/perspectives/blog/financial-markets-have-taken-over-the-economy-to-stop-the-next-crisis-they-must-be-brought-to-heel.} The number of assets under professional management, the amount of money in the “market”, and the variety and supply of available financial products continues to expand.\footnote{See generally Robin Greenwood & David Scharfstein, The Growth of Finance, 27(2) JOURNAL OF ECONOMIC PERSPECTIVES 3 (2013).} Nascent product innovation has flourished post-GFC, as evidenced by an increasingly wide variety of new and exotic ETFs.\footnote{See generally Robin Wigglesworth, Worries Over Exotic Exchange Traded Funds Deepen, FINANCIAL TIMES (February 14, 2018), https://www.ft.com/content/6c4f40de-1113-11e8-940e-08320fc2a277.} The universe of available ETF products can be overwhelming\footnote{See Vildana Hajric & Annie Massa, ETFs Use Anything For Attention To Crack Tough Market, BLOOMBERG (December 20, 2018), https://www.bloomberg.com/news/articles/2018-
artificial intelligence and robotics ETFs,\textsuperscript{679} and managed futures.\textsuperscript{680} A recent report on the ETF market by the \textit{Securities Industry and Financial Markets Association} (SIFMA) called the product selection in ETFs “the Baskin Robbins of choices” including index-based, activity managed, asset-criteria, region-criteria, sector-specific, investment-style specific and even “fund of fund” structures.\textsuperscript{681}

The Bank for International Settlements in a 2011 report (“BIS Report”) identified several complexity-driven systemic risks and market vulnerabilities as a result of the growing ETF sector.\textsuperscript{682} The primary concern in the report was the way that ETFs act to “lengthen the financial intermediation chain” and thereby make risks less transparent and more difficult to detect.\textsuperscript{683} When strategies are replicated through new fund structures, these opaque risks “build-up” in the financial system.\textsuperscript{684} The BIS Report identifies the risks being particularly acute for ETFs that create synthetic exposures using derivatives.\textsuperscript{685}

Nassim Nicholas Taleb, in his best-selling critique on modern financial institutions \textit{Antifragile}, noted that the “problem of the commercial world is that it only works by addition (\textit{via positiva}), not subtraction (\textit{via negative})”\textsuperscript{686} – and the same might be true of the secondary market for ETFs. Product supply (and complexity) is unidirectional, and one questions what effect this “additive” growth is having on financial stability and whether ETF intermediaries represent what Taleb characterizes as “fragilizers,” since they gain at the “expense of others by getting the upside (or gains) from volatility, variations, and disorder and exposing others to the downside risks of losses or harm”\textsuperscript{687}.

\begin{footnotesize}
\begin{enumerate}
\item[683] \textit{Id.} at 1-2
\item[684] \textit{Id.}
\item[685] \textit{Id.} at 11.
\item[686] \textit{Nassim Nicholas Taleb, Antifragile: Things That Gain From Disorder}, 400 (1st ed. 2014)
\item[687] \textit{Id.} at 5.
\end{enumerate}
\end{footnotesize}
One market commentator identified that complexity of modern capital and derivatives markets “involve multiple methods for extraction of value by the financial sector that must be paid for by the productive economy.” He further suggests that such extractions are facilitated by information technology fueled information asymmetries that exist between trading counterparties (like between HFT and retail investors). Similar critiques have been levied squarely at the ETF industry and some believe that the demand for new product structures is “supply” based and driven by fund providers not investor interest.

Critics of modern financial complexity have argued that “financial markets exist primarily to serve themselves” and that complexity has facilitated “rent-seeking” which gets conflated with “creating value.” Others suggest that financial market growth is “a function of the financial economy detaching from the real economy” and money flowing to finance (where it earns higher returns through “misallocation” and price “distortions.”) Professor, and Nobel Laureate, Paul Krugman has suggested that modern financial markets create “money for nothing.” Others, such as Rana Foroohar, go as far as to call it “unproductive finance” and a cause of societal income inequality.

Professor Jeremy Kidd has identified rent seeking in the financial sector as indicative of “market distortions” and a loss in net social welfare if new innovations only yield wealth transfers. Further, it allows powerful

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689 Id. at 1177.
693 Paul Kedrosky & Dane Stangler. Financialization and Its Entrepreneurial Consequences, KAUFFMAN FOUNDATION RESEARCH SERIES: FIRM FOUNDATION AND ECONOMIC GROWTH, 8 (March 2011).
incumbents to limit market competition, leading to higher costs and reduced value in financial services.697

When analyzing the mechanics of the ETF ecosystem one can easily see the salience of such modern financial market critiques. The central operation of an ETF, which revolves around arbitrage to equalize discrepancies between a fund’s NAV and the ETF’s secondary market trading prices has been criticized as a “shell-game scam” designed to extract profits (via bid-ask spreads) from inexperienced investors, and criticized by one trader as designed “not to help investors but to Hoover up their nickels and dimes at very fast speeds.”698 The issue with bid ask spreads is even more pronounced in leveraged products, and ETFs that have low trading volume.699

b. Complexity, Opacity and ETF Interaction Risks

As institutions experiment with new ETFs, informational complexities are introduced into the financial system. Economist Hyman Minsky, whose work has grown posthumously significant since the GFC, identifies the possibility of “several layers of intermediation” as a by-product of the financial system’s “institutional complexity.”700 Such layers are clearly visible in the ETF operating ecosystem. A group of economic researchers including Nobel prize winner Joseph Stiglitz has also documented how financial institutions form “multilayer networks”701 and the “default probability” of one institution in a network is affected by the default probability of the entire network (which is increasingly difficult to compute as the network grows in complexity).702

As markets grow more complex through intermediation lawyers, there is a potential “amplification of errors” and an increase in systemic risk.703 However, this systemic risk is difficult to accurately compute because systemic risk probabilities are “very sensitive to errors on information about contracts as

697 Id. at 167.
698 See Martchev, supra note 496.
699 Id.
702 See id. at 10033.
703 See id. at 10031.
well as on information about the complexity of the network structure.” 704 Professor Kathryn Judge has also outlined how increased market complexity from financial innovation has enhanced systemic risk705 based on the concept of “fragmentation nodes” (financial innovations that “provide close substitutes for goods and services historically provided by banks.”) 706 She argues that complexity in these structures “impedes transparency and flexibility in ways that increase systemic risk.”707 This is relevant given the aforementioned ESRB Report that notes some banks view ETFs are a liquid substitute for cash.

The migration of PhDs to Wall Street, and an enhanced focus in business school curricula on quantitative market and trading models has encouraged “financial engineering” in investment products.708 At the heart of the academic takeover of conventional trading is algorithmic trading and HFT. Professor Yesha Yadav has argued that algorithmic trading has “undermined efficient capital allocation” (resulting in an information loss) by introducing systemic “model risk” 709 and disincentivizing informed traders from correcting “information deficits” because of the costs of competing with HF traders.710 This could lead to a “skewing” in favor of HF traders which favors “short-term and more cheaply researched information.”711

Another way that Yadav notes HFT may be leading to less efficient markets is that information that “falls outside of the scope of their programming” is not incorporated into the algorithms;712 therefore, when “exceptional events” occur (like a liquidity freeze in fixed income ETFs) a short-term market withdrawal becomes less costly than a re-programming.713 Yadav’s research is supported by other empirical studies in finance finding short-term “directional” efficiency in HFT but pro-cyclicality in a crisis,714 and the imposition of costs

704 Id.
706 Id. at 659.
707 Id. at 660.
708 See Knowledge at Wharton, infra note 785.
709 Model risk has been described by Yadav as “models generate overly stylized, simplified representations of otherwise messy economic relationships. Put more simply, models can be unreliable and generate bad outcomes. The sources of such error can be numerous.” See Yesha Yadav, How Algorithmic Trading Undermines Efficiency in Capital Markets, 68 VAND. L. REV. 1607, 1647-1648 (2015).
710 See id. at 1615
711 Id. at 1670.
712 Id. at 1613.
713 Id. at 1614.
on “informed traders” both of which lend support against the orthodox view of security pricing as efficiently incorporating all information. 715

ETFs, which are heavily traded by HF traders, 716 find themselves squarely in the middle of a debate on the distorting effects of financial product innovation on information and price discovery. ETF are heavily traded, and often held for only very short periods of time – or “heartbeat” trades for strategic tax reasons – a strategy called Wall Street’s “dirty little secret.” 717 Strategies like this highlight a modern day phenomenon facilitated by today’s lightning fast trading infrastructure: financial instruments like ETFs aren’t just purchased for their intrinsic value, or because of a long-term desire for exposure to an underlying asset class, but for a variety of short term motivations. 718

The takeover of financial market trading by short-term-gain focused algorithms interplays with the broad investment trend which favors passive and index investing over active stock selection and fundamental analysis of underlying asset value. 719 J.P Morgan Chase analysts recently estimated that nearly 90% of all equity trading is “trend” based from “quant, index, ETFs, futures and options-related strategies. 720 Some economists believe that disregarding fundamental information in favor of mimicking popular index structures is creating a store of systemic risk due to “stocks that were disproportionately bought because of ETFs and index funds being disproportionately sold.” 721 Further, information becomes more difficult to ascertain in “complex, noisy and opaque” markets which can lead to a “misallocation of capital.” 722


715 See Yadav, supra note 709 at 1615.


717 See Mider et al., supra note 488.

718 Id.

719 See Megan Greene, Passive Investing Is Storing Up Trouble, FINANCIAL TIMES (August 2, 2018), https://www.ft.com/content/cdbdd01a-95b4-11e8-95f8-8640db9060a7.

720 See David Thomas, A Warning From The Late John Bogle, FORBES (February 12, 2019), https://www.forbes.com/sites/greatspeculations/2019/02/12/a-warning-from-the-late-john-bogle/#6c00a7d62b99.

721 Greene, supra note 719.

722 Id. (“One would be hard pressed to find a customer willing to hand their money to an investor who genuinely does not care about fundamentals or price. Yet this is the strategy pursued by passive and quant funds.”)
Further, not only do risks arise in the “operation” of the ETF structure (like liquidity illusions illustrated in the series’ first article), but they also arise by “how” the ETFs themselves are used. For example, it’s been recently reported that mutual fund managers, and other institutions, are increasingly using bond and other fixed-income ETFs as cash surrogates. 724 If these funds experience a large redemption demand (driven from a different external factor), they will have to sell these ETFs to obtain cash to satisfy client withdrawal requests, and this ETF sell off could both induce a liquidity crunch in the bond ETFs and a cash shortfall (if they can’t easily sell the ETFs) while also induce a contagion sell off in the underlying bonds.725

c. ETF’s Impacts on Asset Prices as a Source of Fundamental Information

Neoclassical economic theory looks to price as a signal of all available information and corresponding risk (including liquidity) of an asset.726 The extent that prices are an efficient727 signal of “all” available information (and risks) is a live and rigorous debate;728 however, some researchers believe markets (and asset prices) are not completely efficient,729 do not reflect “all” available information,730 and are susceptible to human biases, unpredictable

723 See Clements, supra note 498 at 15-27.
725 Evans & Barrett, supra note 724.
727 To trace the origins of the “efficient market hypothesis” see LOUIS BACHELIER, THE THEORY OF SPECULATION (1st ed. 1900); PAUL COOTNER, THE RANDOM CHARACTER OF STOCK MARKET PRICES (1st ed. 1964); BURTON MALKIEL, A RANDOM WALK DOWN WALL STREET (1st ed. 1973); and Eugene Fama, Random Walks in Stock Market Prices, 21(5) FINANCIAL ANALYSTS JOURNAL 55 (1965).
decisions and behavioral “irrationalities” – a divide that Professor Andrew Lo seeks to bridge through his “adaptive markets hypothesis.”

A central critique of passive investing, and particularly ETFs, is that it disincentives price discovery for assets that comprise an index or benchmark. The interaction between “markets, market participants, and information” is what drives the price of a security to an “efficient” level. It is believed by some that ETFs, and other passive fund structures, are disrupting the price discovery mechanism since ETF investors don’t act to discover the true asset value of a fund’s underlying holdings, so stocks held within funds can be “mispriced.”

The ESRB Report notes that, in most cases, ETF investors use the investment vehicle for exposure to the market itself - or the “systematic risk component of assets” - rather than the “idiosyncratic component” of individual securities. Thus, there is an incentive for price discovery activity for the market (or particularly an ETF sector index, as the case may be), but not the individual security.

Similar to the belief by some prominent investors that ETFs are creating “illusions” of liquidity, a belief is also gaining traction amongst well-known market participants that ETFs (among other types of index products such as index mutual funds) are impeding price discovery and thus masking market risk and distorting information. Billionaire investor Carl Icahn has called the passive investing market a “bubble,” with Jeffrey Gundlach and Jack Bogle

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733 See Roberts, supra note 596.
735 Id.
736 ESRB Report, supra note 490 at 19.
737 See L.R. Glosten, S. Nallareddy, & Y. Zou, ETF trading and informational efficiency of underlying securities, COLUMBIA BUSINESS SCHOOL RESEARCH PAPER, NO 16-71 (2016).
738 See Clements, supra note 14 at 27-29.
warning about the “herding” potential in ETFs (the focus of this article’s first section), and Nobel Laureate Robert Shiller, as well as hedge fund manager Howard Marks, expressing concern about a indexer’s “free-riding” on those who perform active price discovery.740

Michael Burry, the antihero of Michael Lewis’ best-selling book The Big Short, and who was portrayed by Christian Bale in the Academy Award winning movie of the same title, has been particularly vocal against index funds and ETFs, calling them a bubble.741 He has also compared them to controversial financial products in the GFC like collateralized debt obligations (CDOs).742 Burry rose to great wealth, and notoriety, with contrarian bets against CDOs in the lead up to the GFC.743 Burry’s central critique is that, just as demand for CDOs and other mortgage backed-securities “distorted” prices for subprime mortgages in the GFC, demand for ETFs and passive investment structures is distorting prices for large capital equities (particular U.S. companies) which comprise the popular indexes.744 He suggests that demand for large-cap index funds has impeded price discovery and inflated those stocks, while pushing down prices of smaller companies (who are “under-represented” in passive funds), and that the longer the flows move in this direction, the greater the fallout will be when it “reverses.”745

Burry, who is known for his steely resolve, and an aversion to pulling punches when criticizing Wall Street behavior, suggests that “[t]his structured asset play is the same story again and again,” driven by the marketing savvy of asset managers who know they can make up for low fees with “scale.”746 Yet in reality, according to Burry, this trend is fueling another “bubble”, and causing

740 Id.
743 Id.
745 Id.
746 Id.
smaller companies to be “orphaned” for the herd-driven demand of large-equity indexes.747

Burry’s contention is not without some empirical support, ETF’s share of “passive fund assets” grew from around 30% in 2007 to over 40% in 2017.748 A 2019 estimate noted that passive management now controls almost half of the current U.S. stock market.749 Other estimates note that a surge in passive investors over the last two years has pushed the control of equities in the U.S. by passive vehicles to around 60%, with a further 20% of market share controlled by non-fundamental algorithmic quant-funds.750 This means that markets are now more “sensitive to headlines and more prone to sharp price swings” since they are less reliant on asset fundamentals.751

Also supportive of Burry’s thesis is evidence of a valuation differential between large-capitalization stocks and smaller companies.752 A recent investigation on this subject noted that large companies, which frequently comprise popular indexes, currently trade at a “premium”753 to smaller ones.754 This is not necessarily a complete picture, however, as it is possible that the differential is reflective of smaller companies being riskier propositions.755 Nevertheless, it highlights an important area of needed additional research: to what extent are passive investment flows into large-cap heavy index funds inducing an artificial premium in the price of these large companies?

The Bank For International Settlements (BIS), in a recent study on “the implications of passive investing for securities markets” has suggested that it “seems plausible that the portfolio-wide investing and trading of passive funds could bring about greater correlation of index securities and reduce the security specific information contained in prices” and has advocated for more studies on

747 See Winck, supra note 741.
751 Id.
753 See id. The premium in the study is noted by the evidence that “large companies have much lower earnings yields (inverse of “P/E”) than smaller companies.”
754 Id.
755 Id.
the impact of ETF trading and the prices of underlying securities. The BIS report notes the ability of passive fund managers to “free-ride” on the valuation efforts of active fund managers for individual securities in an index, thus “an increase in the share of passive portfolios might reduce the amount of information embedded in prices, and contribute to pricing inefficiency and the misallocation of capital.”

There is also a growing body of evidence showing that ETFs are associated with “co-movement of asset prices” for the securities included in the index itself (both with each other and with the index price) and between ETFs with similar benchmarks. Recent studies further reveal that arbitrage of ETFs, which tracked the S&P 500, led to co-movement of S&P 500 stocks. Underlying asset price co-movement makes markets less efficient by distorting the informational value of the stock itself (making it sensitive to index-based “news” trades rather than security specific fundamental information). It also introduces system-level risk through the possibility of investor simultaneous loss, “synchronized” sell-offs, and company insolvencies.

Also, price co-movement is driven by the activities of APs acting under the arbitrage function who purchase, or sell, underlying securities based on the “portfolio weights in the creation baskets” and, as identified in the ESRB Report, companies that are over-weighted in an index have “arbitrage sensitivity” and “higher co-movement with ETF returns” (and these securities tend to “overreact to a repricing of an ETF”).

Israeli et al. (2017) has also linked increased ETF ownership with a decline in “price efficiency of the underlying security” since ETFs attract uninformed (“noise”) traders (since ETFs are cheaper to trade), and they increase the costs in obtaining valid information about the underlying assets (to reward informed traders), and simultaneously disrupt the supply of available underlying

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756 See Sushko & Turner, supra note 748 at 129.
757 Id. at 119.
758 ESRB Report, supra note 490 at 2, 19.
759 Id. at 19.
762 ESRB Report, supra note 490 at 2, 19.
763 Id. at 19.
tradeable securities due to their being held by a fund sponsor.\textsuperscript{764} Similarly, Goldstein & Yang (2017) have suggested that “trades not only bring fundamental information, through their speculative trading, but also unrelated noise, through their hedging-motivated trading, into futures price.” \textsuperscript{765} As a result, the “information effect” can either reduce or exacerbate “futures price bias.”\textsuperscript{766}

At the heart of these studies is the observation that while passive investment strategies like ETFs provide low-cost benefits, they also come with “indirect costs” to financial markets including a potentially distortive impact on the value (and clarity) of securities prices as information signals.\textsuperscript{767} Recent research also suggests “ETF ownership may be detrimental to firm performance” as it impacts “the relationship between prices and corporate policies.”\textsuperscript{768} Other price distortive impacts in ETFs, recently cited, include increased price correlation of securities that comprise a given index (thus reducing the benefits of diversification all together); an increase in the valuation of the underlying securities (since they are purchased more often); and the observation of “excessive movements in the underlying securities and a subsequent reversal in prices.”\textsuperscript{769}

In the context of a crisis, some believe that active market participants will provide stability by purchasing undervalued assets when passive investors (who don’t know the true value of the underlying asset) withdraw from the market.\textsuperscript{770} Therefore, as the argument goes, passive investors free-ride on the upside of a fund’s value (the performance of the market) but contribute to economic instability in volatile markets and during a crisis.\textsuperscript{771}

\textsuperscript{764} See Doron Israeli, Charles M.C. Lee & Suhas A. Sridharan, Is There A Dark Side To Exchange Traded Funds (ETFs) An Information Perspective, 22 REVIEW OF ACCOUNTING STUDIES 1048, 1048-1050 (2017).
\textsuperscript{765} See Itay Goldstein & Liyan Yang, Commodity Financialization and Information Transmission, AFA 2016 ANNUAL MEETING; ROTMAN SCHOOL OF MANAGEMENT WORKING PAPER NO. 2555996, 2; (June 1, 2017), available at https://ssrn.com/abstract=2555996.
\textsuperscript{766} Id. at 26.
\textsuperscript{768} Id.
\textsuperscript{769} See Ricardo Crisostomo & Jorge Medina, ETFs and Financial Stability; A Compendium of Possible Risk Sources, CNMV BULLETIN QUARTER IV, 71, 73 (2018).
\textsuperscript{770} See Rickards, supra note 587.
\textsuperscript{771} Id.
The distortive impact of ETFs on underlying asset price formation is not settled.\textsuperscript{772} The Central Bank of Germany recently called the relationship between ETF activity and underlying asset prices “inconclusive.”\textsuperscript{773} There are also additional recent empirical studies that downplay the extent that ETF trading leads to “spillover effects” in underlying assets.\textsuperscript{774} Also “passivity in purchase decisions” doesn’t necessarily imply a “passivity on the part of ETF companies as regards management control” as ETF sponsors can influence corporate decisions making “by exercising voting rights in shareholders’ meetings.”\textsuperscript{775}

ETFs may also positively contribute to price formation by providing “additive liquidity” in the secondary market.\textsuperscript{776} However, the significant growth of ETFs as an asset class make price-driven information signals, and their relationship to passive investing, a worthwhile development to continually investigate.\textsuperscript{777} Further, there are a growing number of professional investment managers that are concerned about the effect these popular products are having on the market’s informational efficiency.\textsuperscript{778}

d. ETF’s Impact on Volatility and Price Movement in Underlying Assets

Secondary market financial product growth (of which ETFs represent a large proportion) may also be facilitating asset price bubbles and increased market volatility.\textsuperscript{779} The ESRB Report identifies that ETFs are “associated with increased price volatility of the constituent securities” and that ETFs also attract more short term, directional, and noise traders that increase both the volatility of

\textsuperscript{775} Deutsche Bundesbank ETF Report, supra note 773 at 96.
\textsuperscript{776} Id. at 99.
\textsuperscript{777} Id. at 96.
\textsuperscript{778} See SEEKING ALPHA, What To Do When ETFs Become Weapons of Mass Destruction? (June 10, 2018), https://seekingalpha.com/article/4180604-etfs-become-weapons-mass-destruction (Some fund managers have even gone as far as calling them “weapons of mass destruction” given their distortive impact on stock prices.)
ETF index, and its individual constituent securities.\textsuperscript{780} It also notes that certain type of ETFs (like those that use leverage) can “amplify the volatility of security prices through their rule-based trading strategies.”\textsuperscript{781}

In a related study, Ahmed et al. (2017)\textsuperscript{782} presented evidence, using daily stock market data from January 1993 to March 2005, of the presence of “nonlinear speculative bubbles” increasing in incidence over time in 23 international markets.\textsuperscript{783} Other studies suggest that certain types of financial product innovations may be decreasing market liquidity\textsuperscript{784} while increasing volatility (through “interaction” effects and “flash crashes”).\textsuperscript{785} The cumulative effect of heightened volatility, as noted by the ESRB Report, is that “large short-term directional bets in the ETF market can eventually result in market crashes, and thus exacerbate the volatility of the index itself, as well as the sensitivity of security prices to market crashes.”\textsuperscript{786}

A recent paper by Professors Itzhak Ben-David, Francesco Franzoni and Rabih Moussawi has linked ETFs with an increase in volatility in underlying securities,\textsuperscript{787} confirming results from previously investigations.\textsuperscript{788} This research shows empirically that “stocks with more ownership by ETFs display higher volatility than otherwise similar securities” – a result the authors attribute to ETFs being the “preferred habitat” of investors like HFT or other “short-horizon liquidity traders” with “higher turnover.”\textsuperscript{789} Thus HFT driven ETF “demand shocks” from enhanced secondary market trading can spill over to the prices of the underlying securities leading to their higher volatility.\textsuperscript{790} Also, this study found that increased volatility in the underlying stocks, brought on by ETF

\textsuperscript{780}ESRB Report, supra note 490 at 2, 20-24.
\textsuperscript{781}Id.
\textsuperscript{782}See Ahmed et al, supra note 779.
\textsuperscript{783}Id. at 9.
\textsuperscript{785}See KNOWLEDGE AT WHARTON, UNIVERSITY OF PENNSYLVANIA, The Impact of High Frequency Trading: Manipulation, Distortion or a Better-Functioning Market? (September 30, 2009), http://knowledge.wharton.upenn.edu/article/the-impact-of-high-frequency-trading-manipulation-distortion-or-a-better-functioning-market/.
\textsuperscript{786}ESRB Report, supra note 490 at 20.
\textsuperscript{788}See Timothy Krause, Sina Ehsani & Donald Lien, Exchange Traded Funds, Liquidity and Volatility, 24 JOURNAL OF APPLIED FINANCIAL ECONOMICS 1617 (2014).
\textsuperscript{789}See Ben-David et al. supra note 787 at 2471 & 2531.
\textsuperscript{790}Id. at 2473.
trading, didn’t enhance price discovery, but was distorting “noise”. This suggests ETFs may be making markets less efficient, and potentially increasing systemic risk since the enhanced volatility is “non-diversifiable.”

The ESRB Report supports the information distorting impact of ETFs including the view that “non-fundamental shocks” are integrated into underlying asset prices as a result of ETF trading.

ETF product variations have been an independent source of heightened volatility, like the linked products that generate returns based on the movement of the CBOE Volatility Index (VIX). Some of these products appreciate when volatility spikes (for example the Barclays iPath VIX Short Term Futures Note (VXX)) while others decrease in value when volatility subsides (for example the Proshares Short VIX ETF (SVXY))—independent of the movement of equity or bond markets. In February 2018, a spike in volatility drove a dramatic sell-off of inverse, VIX-linked, exchange traded notes. Of particular concern, Credit Suisse’s VelocityShares Daily Inverse VIX Short-Term ETN (XIV), during the crash traded “at a more than 92 percent discount to [its] closing value the prior day” and resulted in Credit Suisse terminating the product. These products also create counterparty risk, since they are redeemed in large blocks and depend on the creditworthiness of the issuer. Also, there is empirical evidence of trading volume similarities between volatility related ETPs and volatility futures.

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791 See id. at 2531.
792 Id.
793 Id.
794 See ESRB Report, supra note 490 at 22.
797 Michael Shields & Trevor Hunnicutt, Credit Suisse ‘volatility’ fund liquidated after market selloff, REUTERS (February 6, 2017), https://www.reuters.com/article/us-credit-suisse-gp-notes/credit-suisse-volatility-fund-liquidated-after-market-selloff-idUSKBN1FQ256; An ETN or “exchange traded note” is legally distinct from an ETF, see Hu & Morley, A Commendable Start, supra note 485 at 1178 (“Moreover, the use of such a moniker would help curb the mistaken belief on the part of some investors that exchange traded notes (“ETNs”) are little different economically from ETFs. Among other things, ETNs are debt instruments and thus entail credit risk exposure to the issuers of the ETNs. ETF shares, in contrast, offer stakes in pooled investments and only entail credit risk exposures to the issuers of the debt instruments in the ETF’s portfolio.”)
which supports the argument that these products aren’t solely a hedge instrument but rather an independent contributor of market volatility.\textsuperscript{799}

e. How Complexity and Informational Opacity Impacted the Global Financial Crisis

The complexity and opacity of the over-the-counter derivatives market,\textsuperscript{800} and the wholesale and repo markets,\textsuperscript{801} undoubtedly influenced the GFC. Complexity risk has also been cited as a contributing factor in the Enron scandal and the Long-Term Capital Management failure.\textsuperscript{802} There is evidence that complexity and a “glut” of financial intermediation facilitated an “information loss” in the GFC.\textsuperscript{803} As Professor Manuel Utset has noted, markets are multi-actor “complex institutions” that facilitate price discovery through the aggregation of information;\textsuperscript{804} however, the proliferation of “many markets and meta-markets” (i.e. market complexity), through an extended chain of financial intermediation, increases informational opacity in regards to risk, despite rational behavior by individual actors.\textsuperscript{805}

This occurs because complexity (produced by difficult to value securities, and interconnectedness between intermediaries) will “increase the immediate costs of investing in information” and thereby drive an incentive to delay obtaining such information and instead transfer the information risk to another party.\textsuperscript{806} In an opaque information environment all parties end up acting in a similar manner (herding) because conducting the “due diligence” to ascertain the true risk of an underlying investment is too costly – and thus an individually rational decision leads to aggregate “informational deficits” at the group level.\textsuperscript{807}

\textsuperscript{800} See Stout, supra note 730.
\textsuperscript{804} Id. at 407.
\textsuperscript{805} See id. at 408.
\textsuperscript{806} Id. at 424.
\textsuperscript{807} Id. at 428.
This dynamic was manifest in the GFC through the repo market runs on Lehman where lenders had an incentive to maintain their “equilibrium position” (roll-over the repo) until they “simultaneously” reversed their position.\(^808\) As Professor William Fisher has described, the repo lenders were “information insensitive until shock” meaning that they continued lending on new information, without adjusting terms, until they withdrew in seeming coordination (like “retail depositors during a bank run”).\(^809\) Fisher adds that the case of Lehman was one of “extreme” liquidity risk because the “fatal liquidity” context developed quickly (as he notes – with “frightening speed”\(^810\)). The liquidity failure was driven by actors “outside” of Lehman (like the triparty repo lenders and clearing bank) with complex and “fast-moving” interactions; sophisticated parties acted in herds, and they didn’t adjust to new information gradually, but rather “simply stopped lending altogether.”\(^811\) Also there was asymmetrical information and the “concealing” of intentions between multiple parties.\(^812\)

Liquidity risk that is “extreme” has been described as “inherently opaque” by Professor Fisher since it is impossible to disclose in a timely way.\(^813\) This means that heightened risk disclosure won’t necessarily work (Professor Fisher calls this “predicting a heart attack.”)\(^814\) To make his case Fisher details the both the clearing bank “liquidity squeeze” that JP Morgan imposed on Lehman with its triparty repo collateral “haircuts,”\(^815\) and the repo lender run on Lehman that occurred when lenders almost simultaneously pulled funding support.\(^816\)

Research from the Financial Stability Board, and the Federal Reserve Bank of Boston (FRB) has also found that opacity “exacerbated” the roll-over risks in the wholesale funding markets during the GFC and encouraged creditor runs; and that efforts to reduce risk-opacity would have had the additional benefits of “enhancing market discipline” and aid in the staving off of credit

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\(^808\) Id. at 441.
\(^809\) See Fisher, supra note 518 at 485.
\(^810\) Id. at 521.
\(^811\) Id. at 523.
\(^812\) Id. at 521-523.
\(^813\) See id. discussion at 521-523.
\(^814\) See id.
\(^815\) Id. at 524.
\(^816\) See id at 471
\(^816\) See id. at 485
runs.\textsuperscript{817} It could also decrease contagion,\textsuperscript{818} and the spreading of runs to other institutions or asset classes.\textsuperscript{819}

f. Do Investors Really Understand ETF Interaction Risks?

As the investor base for ETFs grows, it is fair to wonder whether average investors understand “interaction risks” like liquidity illusions and mismatch, investor herds and information distortion cited by this article (and its predecessor) in their investment decisions, and can make a “realistic assessment of how ETFs will perform in stressed market conditions.”\textsuperscript{820} Further, one wonders the extent that rationality even plays into the decision to invest in ETFs all together since there is empirical evidence that “investment flows tend to chase ETFs”\textsuperscript{821} rather than an assessment of the “managerial skill” or financial prospectus of the underlying company.\textsuperscript{822}

The fragilities within the ETF ecosystem highlight a separate (but relevant) uncertainty regarding the efficacy of regulatory disclosure requirements – including the extent that risks in certain types of ETFs have become what Professor Henry Hu has characterized as “too complex to depict.”\textsuperscript{823} It also triggers an analysis of the informational effectiveness of

\begin{footnotesize}
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\item \textsuperscript{817} See \textsc{Financial Stability Board}, \textit{Policy Framework for Addressing Shadow Banking Risks in Securities Lending and Repos} (2013); see also Michal Kowalik, \textit{Opacity and Disclosure in Short-Term Wholesale Funding Markets}, \textsc{Federal Reserve Bank of Boston Working Paper RPA 16-02}, 1 (September 15, 2016).
\item \textsuperscript{818} Regarding contagion risk there is modelling evidence that small shocks in complex financial networks can lead to widespread fallout. See Richard J. Caballero & Alp Simsek, \textit{Fire Sales in a Model of Complexity}, 68(6) \textit{The Journal of Finance} 2549 (2013).
\item \textsuperscript{819} Kowalik, \textit{supra} note 817 at 2-7.
\item \textsuperscript{820} See \textsc{CBI Discussion Paper} \textit{supra} note 582 at 11.
\item \textsuperscript{821} See \textsc{ESRB Report, supra} note 490 at 22; see also C.P. Clifford, J.A. Fulkerson & B.D. Jordan, B.D., \textit{What drives ETF Flows?} 49(3) \textit{Financial Review} 619 (2014).
\item \textsuperscript{822} See \textsc{ESRB Report, supra} note 490 at 22; see also M. Broman, \textit{Liquidity, style investing, and excess comovement of Exchange-Traded Fund returns}, 30 \textit{Journal of Financial Markets} 27 (2016).
\item \textsuperscript{823} See Henry T.C. Hu, \textit{Too Complex To Depict? Innovation, “Pure Information,” And The SEC Disclosure Paradigm}, 90 \textsc{Tex. L. Rev.} 1601, 1602 (2012). ( “[m]odern financial innovation has resulted in objective realities that are far more complex than in the past, often beyond the capacity of the English language, accounting terminology, visual display, risk measurement, and other tools on which all depictions must primarily rely.”); \textit{additionally, see discussion at} 1654 (“the process of financial innovation may be undermined by cognitive biases (e.g., ignoring low probability, catastrophic events in derivatives modeling); the peculiarities of financial ‘science’ (e.g., departures from traditional scientific norms such as ‘universalism’), and the inability of banks to fully capture the benefits of their financial research and development (e.g., this ‘inappropriability’ resulting in the failure to invest enough to fully understand the characteristics of their complex products.”)
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adding further disclosure to the already gargantuan requirements that financial product issuers face. Further studies are warranted on the interaction effects between these ETF ecosystem intermediaries and the possibilities for “feedback loops” or underlying asset price “distortions,” especially as ETFs evolve away from broad indices and head further down the path of sectoral or strategic focus.

Even if investors are able to fully appreciate the risks when investing in ETFs, recent research suggests that they may not be able to otherwise diversify it. A recent study determined that that “ETF ownership exacerbates the co-movement in the liquidity of constituent stocks” and that this co-movement is driven by the arbitrage function. The authors conclude their study by noting “we show that as ETFs continue to grow and gain higher ownership of stocks, it can reduce the ability of investors to diversify liquidity shocks due to an increase in the commonality in liquidity of stocks included in ETF portfolios.”

Nevertheless, it is worthwhile to consider how to increase the informational, and operational, efficiency of the ETF ecosystem of which added disclosure may be necessary. Given the centrality of ETF arbitrage to the risks noted in both this paper and its predecessor, serious consideration should be given to regulatory simplification for ETFs, and specifically the proposal by Professors Hu and Morley, where they suggest a special emphasis on a clear naming convention to distinguish ETFs from other ETPs, more effective disclosure (they advocate for both “qualitative” and “quantitative” forms) around potential arbitrage breakdowns which could cause liquidity illusions, and what Morley and Hu further describe as “trading price frictions” including bid-ask spreads and areas where the “arbitrage mechanism” could potentially become impaired or fail.

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825 See CBI Feedback Statement, supra note 566 at 47-48.
827 Id. at 20.
828 Id. at 21.
829 See Hu & Morley, A Regulatory Framework, supra note 490 at 842-851, 934-936; see also Hu & Morley, A Commendable Start, supra note 490 at 1157-1161, 1200-1201.
Further, in 2018, the SEC instituted rule 22e-4, and a new disclosure form (N-PORT), for liquidity risk management program disclosure for open-ended funds including ETFs. These disclosures seek to protect investors by creating enhanced transparency and ensuring funds can meet shareholder redemptions. There are regulatory restrictions on ETF illiquid holdings and ETFs must continually assess “liquidity cost to the authorized participant or other market participant, which could increase the cost of their participation and interfere with their role in the ETF arbitrage mechanism.” These rules require the ETF’s annual shareholder report to provide “on an annual or semi-annual basis a narrative discussion of the operation of the fund’s liquidity risk management program for the most recent fiscal year.” Further, they must include cash balance disclosure and eliminate potential gaming behavior when funds classify their holdings into liquidity baskets.

v. Conclusion

The decline in active investing, and rise in dominance of the passive investing class, has many concerned observers. But what does it ultimately mean to the markets? A line has been drawn in the investment industry between those who support the long-term utility of ETFs, and those who maintain that they are distorting the prices of underlying assets. Those who lament the rise of ETFs, and other passive index structures, suggest that they impede price discovery and that supply and demand for many assets (including large-cap stocks) is now largely driven by “artificial” influences (like demand for the index


832 See CBI Discussion Paper, supra note 582 at 23.

833 See U.S. SECURITIES & EXCHANGE COMMISSION, INVESTMENT COMPANY LIQUIDITY DISCLOSURE, RELEASE NO. IC-33142; FILE NO. 27-04-18); See also Sullivan & Cromwell, supra note 91 at 9

834 See Sullivan & Cromwell, supra note 831 at 9


836 Id.
fund, independent of the actual companies that comprise it).\textsuperscript{837} Also, they note that a lack of price discovery can also distort a “rational allocation of capital.”\textsuperscript{838}

ETFs have positive utility for many investors.\textsuperscript{839} A market so fertile is driven by real demand, and genuine product benefits include lower costs,\textsuperscript{840} tax advantages\textsuperscript{841} and secondary market liquidity.\textsuperscript{842} The most effective counter-argument, when contending against the decline of active investment management, is simply the fact that active managers routinely underperform passive funds at a higher cost - so it’s obvious why investors would be interested in indexing.\textsuperscript{843} The ETF ecosystem is a prime example, however, of a complex “layered”\textsuperscript{844} financial product with resulting “interaction risks” as intermediaries, and investors, pursue individual goals in a collective ecosystem. The question that looms is, at what point (and if at all), as articulated by the late John Bogle, a true “tragedy of the commons” will occur in the ETF market where what’s good for the individual becomes problematic for the wider economy.\textsuperscript{845}

The growing size and future projections of ETFs as an asset class, the way they increase the connection between Main Street and Wall Street (like MBS in the past), their opaque “interaction risks” giving rise to potential instabilities and inefficiencies, and the long-term uncertainty that passive investing may have on the economy,\textsuperscript{846} make ETFs a market segment to closely monitor. But how should regulators, academics, and interested stakeholders (particularly pensions) react? No one wants to revisit the economic fallout of the GFC. This article has identified, however, two echoes of the crisis in the nascent rise of ETFs and passive investing: they could influence the

\textsuperscript{837} Id.
\textsuperscript{838} Id.
\textsuperscript{839} See generally Su, supra note 485.
\textsuperscript{840} Id.
\textsuperscript{844} See Omarova, supra note 668 at 763.
materialization of investor herds which could result in panic selloffs and contagion in a crisis; and they might be decreasing the informational efficiency of asset prices, onset by less active price discovery and an artificial demand for certain stocks simply because of their inclusion in an index. The remainder of the article will identify areas of further research that are warranted, and ideas for regulatory adaptation to increase the price efficiency of the market and mitigate against the risk of information cascades and investor herding.

First, much more empirical research is warranted on the precise nature of the relationship between ETF demand and underlying asset prices. Not everyone agrees with Michael Burry, and other analysts’ content that price discovery in ETF underlying assets is “alive and well”, that the large indexes are comprises of the “most liquid stocks on the planet,” and that index investors are primarily long-run in their investment time horizons. Relationally, further studies should be undertaken on the impact of HFT on efficient price discovery, as well as HFT’s impact on the ETF operational ecosystem.

If the hypothesis of asset price distortion from index fund and ETF demand proves empirically sound, then one wonders whether measures to curb the proliferation of index and passive products is defensible? Paternalism in new investment products is controversial, yet licensing regimes analogous to the regulation of new drugs, have been advanced by Professors Saule Omarova, Eric Posner and Glenn Weyl, Robert Litan, and Heather Hughes. This is

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849 See Saule T. Omarova, License to Deal: Mandatory Approval of Complex Financial Products, 90 WASH. U. LAW. REV. 2 (2012). In this article Omarova suggests a financial product-licensing framework that would “place the burden of proving social and economic utility of complex financial instruments on the intermediaries that structure and market them”, see at 76.
850 Eric A. Posner & Glen E. Weyl, A Proposal for Limiting Speculation on Derivatives: An FDA for Financial Innovation, UNIVERSITY OF CHICAGO INSTITUTE FOR LAW & ECONOMICS OLIN RESEARCH PAPER No. 594 (January 29, 2012), available at https://ssrn.com/abstract=1995077. Posner & Weyl advocate for a financial market product ex ante licensing regime (like the U.S. Food & Drug Administration) and argue that new products should be subject to a “social utility” test focused on whether the product is to be used for speculation or hedging – effectively establishing a more complex “insurable interest rule.” See at 13.
particularly relevant in light of the ongoing “fee-wars” in ETFs as issuers move to “zero-fee” structures to capture market share.853

Continued investigation is also worthwhile on strategies to reduce herding potential in financial market products, like exploring “separating equilibria”, and “heterogeneous” rules (or regulatory relaxations) such as those suggested by Professors Ayres and Mitts.854 This is very relevant given the “crowding” in passive investments that could lead to a bottleneck in a selloff – or as Michael Burry recently noted “[t]he theater keeps getting more crowded, but the exit door is the same as it always was.”855

Finally, the issue of “concentration risk” in the ETF market should be more closely analyzed, including the concentration of financial intermediaries (like APs and MMs) that sit at the heart of the ETF ecosystem, with an eye to discovering how regulation can be utilized to reduce the fallout of herding if a key ecosystem intermediary fails. Relatedly, the extent that ETF fund sponsors (given the industry’s concentration) should be considered “systemically important financial institutions” (SIFI), and subject to more intensive regulatory oversight, should be evaluated.856 This is particularly timely in light of the Financial Stability Oversight Council’s recent proposal,857 to change the rules associated with non-bank SIFIS to focus on “activities” over firm-specific designations.858

853 Eric Platt, Zero Fee and Rebate Deals Throw Down Gauntlet on ETF Charges, FINANCIAL TIMES (July 28, 2019), https://www.ft.com/content/cc79a080-9117-11e9-8ff4-699df1c62544?shareType=nongift
854 See Ayres & Mitts, supra note 528.
855 Yun Li, Michael Burry of ‘The Big Short’ says he has found the next market bubble, CNBC (September 4, 2019), https://www.cnbc.com/2019/09/04/the-big-shorts-michael-burry-says-he-has-found-the-next-market-bubble.html.
Chapter IV: Are Exchange Traded Funds Making Some Asset Managers Too Interconnected To Fail?


i. Abstract

Exchange Traded Funds (ETF) are likely the most successful financial products since the 2008 global financial crisis (GFC). Despite numerous benefits, ETF’s success could be making some asset managers “too interconnected to fail.” Interconnection is a core element of systemic risk, and it played a material role in the transmission of economic shocks in the GFC. This article is the first, in a growing body of literature on ETFs, to provide a comprehensive inquiry into their systemic importance through the lens of interconnectivity. The article provides three unique contributions. First, it shows how ETFs are creating deep and complex interconnections between numerous market participants and service providers, extending to retail and institutional investors, and corporate behaviors and decisions. Second, it illustrates how ETF interconnection creates direct and indirect systemic risk transmission pathways, with unique factors not present in other managed asset products, like the reliance on key market-incentivized intermediaries in a crisis, crowd behaviors from correlated investment exposures, information cascades, runs, fire sales, and non-linear impacts. Finally, it shows how the effective monitoring of ETF systemic risk requires a cross-market analysis to assess the collective behaviors of numerous participants in a complex and interconnected operating ecosystem, and how both activity and entity-level oversight is prudent in this market. While ETF firms are distinct from banks and insurance companies, there’s merit in safeguarding large firm’s economic resilience given their centrality in a highly interconnected ecosystem. As such, ETFs illustrate the importance of considering financial markets as a “system” when designing supervisory frameworks.

ii. Introduction

The Exchange Traded Fund (ETF) is perhaps the most successful financial
product since the 2008 global financial crisis (GFC). They have many benefits, and strong demand factors, including liquidity, cost and tax advantages over mutual funds, easy access to diversified exposures in opaque asset classes, and cash substitutability for institutions in their liquidity management activities. Evidence also supports passive investing providing superior long-run returns. There are concerns, however, that certain ETF issuers may be growing too large. Recent reports suggest that three ETF firms (BlackRock (40 percent), Vanguard (25 percent) and State Street (18 percent)) make up around 83 percent of the ETF market share in the U.S. Another recent study noted that since the GFC, over 80 percent of all “assets flowing into investment funds” have been captured by these three firms. ETF critics argue that they “shut investors out of the high-growth companies that offer higher returns.”

John Bogle (founder of Vanguard) worried however, shortly before his death that “[i]f everybody indexed, the only word you could use is chaos, catastrophe . . . [t]he markets would fail.”

This article is the first, in a growing body of literature on ETFs, to provide a comprehensive inquiry into their systemic importance through the lens of interconnectivity – a material factor in the GFC. Since 2008, highly interconnected ETF mega firms have increased their influence, and voting power, over nearly every publicly traded corporation in America. These firms are fostering deep and complex interconnections between market participants


860. See infra Section IV (c).


866. David Thomas, A Warning From The Late John Bogle, FORBES (Feb. 12, 2019), https://www.forbes.com/sites/greatspeculations/2019/02/12/a-warning-from-the-late-john-bogle/#6c00a7d62b99 [https://perma.cc/F34P-SS45].

867. See infra Section III (c).

868. See infra Section IV (d)(2).
and service providers that traces down to retail investors, main street, and corporate behaviors and decision making.\textsuperscript{869} ETFs are also giving rise to a new subset of systemic risks that have both direct and indirect transmission channels, and which don’t exist in other managed asset classes (like those associated with the ETF arbitrage function, and onset from short-term directional and noise traders attracted to the intraday liquidity of ETFs).\textsuperscript{870}

Optimal financial market interconnectivity is difficult to assess since interconnections can both absorb and amplify shocks.\textsuperscript{871} The ETF operating structure integrates into a “tangled web” of a “genuine” global interconnected financial system, and asset managers like ETF mega firms may require a heightened macro-prudential focus in the future.\textsuperscript{872} ETF systemic risk derives from the potential collective actions of numerous interconnected market participants, experienced through phenomena like the discretionary withdrawals of key market-incentivized intermediaries from the ETF operating substructure in a crisis, and crowd behaviors from correlated exposures creating information cascades, runs, fire sales, and non-linear impacts.\textsuperscript{873}

The Financial Stability Oversight Council’s (FSOC) activities, and entity-based, regulatory frameworks, for non-bank systemically important financial institutions (non-bank SIFIs) when applied separately to ETF firms, both have limitations. As other scholars have recently advocated, activity and entity oversight should not be considered mutually exclusive,\textsuperscript{874} and this article will show how a “complementary approach”\textsuperscript{875} is also prudent for the ETF market. The ETF ecosystem highlights the increasing importance of regulating financial markets as a system.\textsuperscript{876} While ETF firms are clearly distinct from banks and insurance companies, there’s merit in ensuring they are economically resilient and have adequate safeguards given their centrality in a highly interconnected

\textsuperscript{869} See infra Section IV (d).
\textsuperscript{870} See infra Section V.
\textsuperscript{871} See Andrew G. Haldane, Managing Global Finance As A System, MAXWELL FRY ANNUAL GLOBAL FINANCE LECTURE, BIRMINGHAM UNIVERSITY (Oct. 29, 2014) at 3, 9, available at \url{https://www.bis.org/review/r141030f.pdf} [https://perma.cc/GS3K-EPXB] (discussing the evolution of the financial market into a complex and interwoven system that is both “robust” and “fragile”).
\textsuperscript{872} See id. at 3-9.
\textsuperscript{873} See infra Section V.
\textsuperscript{875} Id.
\textsuperscript{876} See Haldane, supra note 871 at 3-5.
The asset managers profiled in this article could be growing “too interconnected to fail” and the most effective regulatory frameworks going forward will need to ensure firm stability and look across the market to assess and monitor the collective behavior of all participants. This study raises post-GFC systemic concerns. It also complements other post-GFC scholarship which identifies a small number of highly interconnected mega-banks sitting in the center of the leading central clearinghouses for derivatives and dominating the derivatives dealer markets.

This article proceeds by first establishing interconnectivity as a core measure of financial market systemic risk on par (if not more important) than size, and how disruptions at widely interconnected firms facilitated the GFC. It then establishes several indicators of high interconnectivity and applies them to the ETF market in Section IV. This Section, after identifying demand factors for ETFs, shows how these products facilitate complex economic interconnections. Section V illustrates how ETF interconnectivity could contribute to systemic risk. Section VI then canvases the challenge of regulating highly interconnected asset managers (like the ETF mega issuers), including the limitations of both activities and entity-based non-bank SIFI rules, and relevant alternative regulatory considerations. The article concludes by considering the true costs of liquidity transformation in ETFs.

### iii. Does Interconnection Increase Financial Market Systemic Risk?

#### a. Moving Beyond Size: When Firms Become “Too Interconnected To Fail”

A “hallmark” of the modern financial system is its “complex links” and deeply interconnected firms, whose operations transcend national borders and encompass a wide range of activities, functions and transactions. Size is not a

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879. See Janet L. Yellen, Interconnectedness and Systemic Risk: Lessons From The Financial
complete measure of a financial institution’s importance in the larger system. 880 Highly interconnected financial institutions played a material role in the fallout from the GFC, and the continued existence (and as this article will suggest, the growing prevalence in the ETF sector) of complex and highly interconnected firms creates ongoing concerns for financial stability. 881 The importance of highly-interconnected financial firms to economic stability has given rise to the concept of “too connected to fail” as a factor potentially as germane as size when analyzing systemic risk. 882

A firm’s size is a “relevant” but “nondeterminative” factor when assessing its systemic importance. 883 Post-crisis analysis by the European Central Bank (ECB) has noted that “the network of the financial system” can become very “vulnerable” and subject to shocks when a “highly connected” network participant experiences material failure, and its interconnectedness can amplify shocks across the entire network rather than absorbing them. 884 Professor Steven Schwarcz has documented how a firm’s “interconnectedness, size, and lack of substitutability” can magnify systemic risk. 885

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883 Kress, McCoy & Schwarcz, supra note 874, at 1469.


Anabtawi also note that inherent in all systems are interconnected elements, and that the financial system (which is a “law-related system”) has elements (like certain market participants and service providers) which exhibit high levels of interconnectivity.

b. The Relationship Between Interconnection And Financial Instability

Some argue that the history of financial crises is also a history of highly interconnected firms, where system-wide risk, and market failure, is a “by-product” of such interconnectedness. Others suggest that interconnectedness is a key to the complexity (and potential fragility) of today’s financial system. Douglas Elliot has argued that “[t]he more connections a firm has with others, the more channels there are to transmit problems.” Several studies have documented how connectivity was present in prior crises. Janet Yellen suggests that interconnectedness was a material factor in the banking panic of 1907, when what first appeared to be a “contained” crisis (limited to a few firms), quickly spread to traditional banks, and the larger economy as a result of “extensive interconnections.” Researchers from the International Monetary Fund (IMF) have also described the role of interconnectedness in the Herstatt Bank crisis in 1974, and the failure of Long Term Capital Management in 1998.

There are several economic benefits to interconnectedness, including

887. Id. at 84.
892. See Yellen, supra note 879.
liquidity, risk diffusion, maturity transformation, and efficient capital intermediation from savers to borrowers; yet the operations of highly interconnected firms in a crisis can also contribute to panicked selling, and contagion to other asset classes. Yellen notes that complex interconnections can “serve to amplify existing market frictions, information asymmetries, or other externalities.” In support of this proposition, empirical research has shown that a high degree of interconnectedness can increase market fragility as instabilities, or panicked sell-offs, in one sector quickly spreads to others in a contagion.

c. Interconnectedness as a Material Factor in the 2008 Global Financial Crisis

The GFC proved that instabilities at widely “interconnected” financial institutions could rapidly transmit shocks throughout the entire economy, and impact the entire “financial system.” When Lehman Brothers failed a “shock was transmitted through money market mutual funds to the short-term funding and interbank markets.” It also froze the derivatives markets as Lehman was thought to be counterparty to $5 trillion in credit default swap (CDS) contracts, causing “gridlock” in money market and fixed income trading as banks “hoarded liquidity.” Similarly, the asset-backed commercial paper market (ABCP) experienced interconnected material distress when “investors reali[zed] that money market mutual funds had invested in paper backed by sub-prime assets.” When ABCP failed, investors soon became “distrustful of all forms of private credit” leading to a near instantaneous withdrawal of liquidity in wholesale funding markets because of complex network linkages of financial institutions. Similarly, in money market funds, when the Reserve Primary Fund “broke the buck” a wave of redemptions “fueled instability in the credit markets.”

895. Yellen, supra note 879.
896. Id.
897. See Allen & Gale, supra note 894, at 4.
899. See Schwarcz, supra note 885, at 35.
900. Yellen, supra note 879.
901. See Andrew G. Haldane, Rethinking the Financial Network, Speech at Financial Student Association, Amsterdam (April 28, 2009), available at https://www.bis.org/review/r090505e.pdf [https://perma.cc/SKJ3-8WD3].
902. European Central Bank, supra note 884, at 5.
903. Id.
The GFC also showed the speed that healthy but highly interconnected institutions can fail. During the crisis “interconnected nonbank institutions” took many risks under lowered regulatory parameters. Bear Sterns was deemed too great of a systemic risk, because of its interconnectedness, to let fail (leading to a bail-out). Yet Bear was smaller than Lehman Brothers (which was allowed to fail). Alan Blinder has suggested that “[t]he primary reason [the Fed saved Bear] was fear that Bear was too interconnected to fail.” The potential shock transmission from the failure of a highly interconnected AIG made its bail-out a necessity.

d. Establishing Indicators of High Interconnectivity

i. Network Analysis and Interlinked Exposures

One way to measure the interconnectedness of a financial institution is through “network analysis.” Using “network representations” has been noted by the Depository Trust & Clearing Corporation (DTCC), as “particularly suitable” to assess the interconnection of financial institutions. The ECB describes this as a process that models “the interlinking exposures either between financial institutions, among the sectors of the economy or across entire financial systems.” The ECB adds that in determining the complexity of a network one

905. See Center For American Progress, supra note 881.
907. See HENRY M. PAULSON JR. ON THE BRINK: INSIDE THE RACE TO STOP THE COLLAPSE OF THE GLOBAL FINANCIAL SYSTEM, at 117 (2010); see also Hunt, supra note 891, at 72-3.
908. Macey & Holdcroft, supra note 880, at 138.
912. The DTCC is the U.S.’s largest post-trade services (clearing and settlement) provider, see About DTCC, DEPOSITORY TRUST & CLEARING CORPORATION, (Dec. 26, 2019), http://www.dtcc.com/about [https://perma.cc/2M3K-2WKT].
914. European Central Bank, supra note 884, at 4.
must look at both “nodes” (participants on the network) and “links” (connections and relationships). In network analysis the concept of “centrality” is critical to determine which nodes on a given network are “of systemic importance.”

A key finding of the DTCC in relation to interconnection-based risk transmission is that financial networks “tend to be robust yet fragile” meaning that they absorb shocks to a “tipping point” where they then spread risks rather than “contain them.” Andrew Haldane has noted that this tension is also exhibited in other complex ecosystems, like tropical rainforests, and that after the tipping point the “systemic dislocation” can often be much larger than the “initial shock.” Interlinked exposures are also evident in the Office of Financial Research’s (OFR) financial connectivity index for globally systemically important banks, which measures the liabilities of banks held by other financial institutions.

**ii. Inter-Firm Credit Exposures and High Leverage**

Another characteristic of a highly interconnected firm is that it engages in credit extension or leverage transactions with other firms. When firms engage in interlinked credit exposures (like borrowing from and lending to each other) they deepen the interconnection. Credit exposures can also generate interconnectedness when firms hold debt securities that are “issued by other institutions.” Further, some studies indicate that the potential for contagion is enhanced for firms with interlinked credit and leverage exposures. This point is relevant to the analysis of the institutional uptake of fixed income ETFs as cash substitutes below. Relatedly, a high level of leverage can increase the

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923. DTCC Whitepaper, *supra* note 913, at 5.
925. *Infra* Section IV (d)(v).
instability of an interconnected firm. ETF issuers (even the mega-players), however, use much lower levels of leverage than traditional banks (a factor often cited against the proposition of heightened prudential oversight).

### iii. Complexity of Operations and Transformation Activities

A firm with a complex operating structure will also be highly interconnected. This can lead to “coordination problems” amongst firms, given an increase in “opacity” of the operations of highly interconnected and complex institutions. As Janet Yellen has noted, as the number of intermediaries involved in a financial process rises, “it becomes increasingly difficult to understand how one member of the network fits into the overall system.” Also, the more complex a firm’s operations, the more difficult it is to resolve. Large and complex firms often operate with thousands of separate legal entities, each interconnected to other firms. Research has revealed that the informational opacity in complex financial operations can exacerbate systemic risks like asset “fire sales,” and contagion is more likely when there is a high level of connectivity. Complexity of operations is also linked to the maturity and liquidity transformation process which in turn links counterparties, creates expectations for market participants (which may be illusory) and can serve to “amplify” systemic risk.

### iv. Contractual Relationships, Direct and Indirect Exposures

A firm’s legal and contractual obligations can create interconnectedness, and foster direct and indirect systemic risk exposures. Direct interconnectedness stems from the fact that a contractual default can have a

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926. DTCC Whitepaper, supra note 913, at 27.
927. See infra Section VI (c).
928. See Yellen, supra note 879.
929. See Freixas, Parigi & Rochet, supra note 921 at 620-21.
930. Yellen, supra note 879.
931. Yellen, supra note 879.
932. DTCC Whitepaper, supra note 913, at 16.
933. DTCC Whitepaper, supra note 913, at 16.
937. See DTCC Whitepaper, supra note 913, at 12.
material adverse effect on a counterparty. Direct interconnectedness can arise from contractual relationships (like service or “infrastructure” agreements), credit exposures or trading links. Indirect interconnectedness can originate through contractual relationships due to factors like “information spillovers,” common asset exposure, fire sales and shadow banking - all of which will be assessed for ETFs in subsections below. Also, because of “interconnecting contracts” firms, and the larger economy, can be disrupted when a party defaults on its obligations, and the default results in the contractual counterparty defaulting on collateral obligations in a “domino-effect.”

v. Institutional, Sectoral and Systemic Interdependencies

Another descriptor of a “too interconnected to fail” institution is that it generates “interdependencies” amongst “institutions, sectors and systems.” The notion of financial market interdependencies as a source of interconnection-based systemic risk has been documented in research by the DTCC. The “complex web of direct and indirect links” in the U.S. financial system was also a material factor in the GFC that linked numerous market participants. The spread of contagion in a market panic is dependent on a variety of links and interdependencies. As subsequent sections in this article will highlight, numerous direct and indirect links are being fostered by large ETF sponsors. A centrally connected financial institution will act as a “hub” with a large number of “links” (generally contractual) with counterparties comprising a large number of “interdependencies.”

iv. How do ETFs Facilitate Complex Economic Interconnections?

a. Post-Crisis Passive Investing and The Rise of ETF “Mega” Firms

The popularity of ETFs have surged post-GFC. They are now an

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938. DTCC Whitepaper, supra note 913, at 5.
939. DTCC Whitepaper, supra note 913, at 4-5.
940. DTCC Whitepaper, supra note 913, at 6 (“The distress or failure of one entity may be interpreted by the market as a negative signal about other entities.”)
941. DTCC Whitepaper, supra note 913, at 6.
942. Anabtawi & Schwarcz, supra note 886, at 88.
944. See DTCC Whitepaper, supra note 913, at 14.
945. DTCC Whitepaper, supra note 913, at 3.
946. See Allen & Gale, supra note 894.
947. See infra Section IV (d).
949. See Bryan Borzykowski, The Trillion-Dollar ETF Boom Triggered By The Financial Crisis Just Keeps Getting Bigger, CNBC (Sept. 14, 2018),
increasingly important component of the modern investment ecosystem. The ETF market has “swelled” in excess of $4 trillion since the late nineties, and in the process led to ETF issuer consolidation and the emergence of a few ETF “mega” firms. Smaller sponsors have been “squeezed out” as the large players compete for valuable assets under management (AUM) which are an independent source of revenue from securities lending. Recent Morningstar data reveals that BlackRock (who issues iShares ETFs) is the largest U.S. and global market issuer, followed closely by Vanguard (one of the pioneers of the industry). State Street is next in line, followed by Invesco, Schwab and First Trust. The lion’s share of the ETF market (studies suggest over 83%) are managed, however, by the top three of BlackRock, Vanguard and State Street. These ETF firms are a continuing focal point for systemic risk “watchdogs.”

b. Estimated Growth Projections of The Most Dominant ETF Firms

The size of BlackRock is particularly striking, with AUM nearing $7 trillion, and a footprint in over 100 countries. It’s effectively become the “biggest investment management company across the globe.” As the ETF market grows the ETF sponsor space is becoming increasingly concentrated, with new money disproportionately flowing into the largest fund structures.

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950. See Su, supra note 863.
952. Id.
953. Infra Section IV (c)(vii).
954. See Wursthorn, supra note 951.
955. Wursthorn, supra note 951.
961. See Wursthorn, supra note 951.
A recent study by Professors Lucian Bebchuck and Scott Hirst projects that within two decades, the three asset management firms with the largest ETF market share (BlackRock, Vanguard, and State Street Global Advisors) could collectively double market power, and in turn exert control over 40 percent of the voting shares of all the companies in the S&P 500. Bebchuck and Hirst add that the voting power of these firms is “even greater than would be suggested by the proportion of shares that they manage, because many other shareholders do not vote.” Given current trends, they suggest that these firms will “dominate” voting of public companies in the U.S. over time. This is a staggering proposition, which one reporter recently called “one of the most consequential economic developments of the past 30 years.”

c. What’s Fueling The Growth of These ETF Mega Firms?

This section will review the most important structural factors fueling the growth of ETF mega-firms. No one factor is determinative, and all have contributed to both the rise of the product class and the corresponding concentration in fund sponsors. The growth of ETFs as a post-crisis phenomenon has, however, been criticized by high profile “active” investors, and academics including Jeffrey Gundlach, Michael Burry, Carl Icahn, Howard Marks and Robert Shiller who suggest passive investing makes markets less efficient and exhibits characteristics of a “bubble.”

i. Passive Net Outperformance and Active Management Disillusion

Perhaps the most compelling factor influencing the rise of ETFs as an asset class is that net of fees, passive fund structures (which include the vast majority of ETFs) have outperformed their active counterparts. This is empirically

962. See Bebchuck & Hirst, supra note 864, at 741.
963. Bebchuck & Hirst, supra note 864, at 738.
964. Bebchuck & Hirst, supra note 864, at 723, 741.
968. See Vladyslav Sushko & Grant Turner, The implications of passive investing for securities markets, BIS QUARTERLY REVIEW, at 116-17 (Mar. 2018),
justified by the “efficient market theory” that hold that all available information is incorporated into the price of securities and thereby “excess future returns are not predictable.”

Also, many investors still feel stung from the failure of most active managers to foresee the GFC, and have redirected actively managed assets into index funds. In addition, recent scandals like the redemption freeze at the U.K. based Woodford Equity Income Fund, support investor demand for ETFs over actively managed, opened-ended, redeemable funds because of their secondary market liquidity.

**ii. ETF Liquidity, Cost and Tax Advantages Over Mutual Funds**

Passive outperformance isn’t the only reason ETFs are popular, as many mutual funds also use passive indexing strategies. Another strong argument in support of ETF’s popularity is that they cost less than analogous index mutual or closed end fund structures. They also have tax advantages over mutual funds. Additionally (and perhaps most importantly), ETFs are easy to buy in the secondary market. Although ETFs have features similar to both closed-end funds, and open-ended structures (like mutual funds), ETF investors don’t

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969. Id. at 116-17; see J. Busse, A. Goyal & S. Wahal, Investing in a global world, 18(2) REVIEW OF FINANCE 561 (2014); Fama & French, supra note 861.


973. See Sarah O’Brien, Why this strategy has been a boon to investors over the last decade, CNBC (Dec. 24, 2019), https://www.cnbc.com/2019/12/24/why-this-strategy-has-been-a-boon-to-investors-over-the-last-decade.html [https://perma.cc/B4JZ-77MY].


have the same redemption procedures as mutual fund investors. ETFs can be purchased like stocks through a brokerage account. This secondary market ETF “liquidity” advantage is a tremendous selling point for investors who are nervous of a mutual fund “redemption freeze.”

### iii. Regulatory Accommodations To Ease The Launch of New ETFs

Another factor contributing to the rise of ETFs (and the growth of mega issuers) are recent regulatory accommodations easing the path to launch for new funds. In September 2019 the Securities and Exchange Commission (SEC) approved a new rule (Rule 6c-11) designed to “streamline the process for offering” ETFs. With Rule 6c-11, certain ETF issuers will no longer have to obtain exemptive relief from the SEC to launch prescribed funds. The rule also provides “flexibility” for “newer ETF issuers and their middlemen to swap stocks or bonds that aren’t an exact, proportional match for the fund’s holdings.”

### iv. Access to Opaque Fixed-Income Markets and Institutional Use as Cash Substitutes

Many corporate and emerging market bonds trade over-the-counter in difficult to access and opaque dealer markets, and fixed income ETFs allow retail investors an access point to these markets. Research suggests that fixed-income and other ETF structures with illiquid underlying assets attract investors

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978. See Kennedy, supra note 975.
981. Id.
983. See id. Rule 6c-11 does not apply, however, to all ETF structures (“ETFs organized as unit investment trusts (UITs), leveraged or inverse ETFs, ETFs structured as a share class of a multi-class fund, and non-transparent ETFs will not be able to rely on the rule.”)
984. Michaels, supra note 980.
985. See SEC Subcommittee Report, supra note 977, at 7-8.
who would not otherwise invest in these sectors. Institutional investors have
flocked to ETFs as a new “tool of choice” in the construction of their
portfolios, and institutional investors are increasingly using fixed-income
ETFs as “near substitutes for cash” because of their high liquidity. Other
benefits of ETFs to institutional investors include “ease of use.” As a result,
recent reports note that institutional ETF assets have “grown at an average
annual rate of 17% since 2014 to reach more than $1 trillion, easily outpacing
the growth rates of most other investment vehicles” with fixed income ETFs
representing the fastest growing segment. Large ETF firms can also offer
institutional investors “liquidity advantages” like more competitive bid-ask
spreads.

v. Ability to Duplicate Novel Index Structures

The variety of underlying asset class exposure seems nearly limitless with
ETFs. To avoid competing head to head with mega firms, new fund issuers
will often devise novel indexes and benchmarks. This is a tenuous strategy,
however, because the large firms can simply copy innovative structures and use
their market power to capture the flow of funds into novel structures. Paradoxically, the fourth largest U.S. ETF issuer Invesco (with over $1.2 trillion
total AUM and $206 billion in ETFs) recently sought SEC protection to keep
ETF portfolio holdings confidential. As will be discussed below, the SEC’s


990. Id. at 2.

991. See Bechuck & Hirst, supra note 864, at 729.

992. See Evans & Eley, supra note 970.

993. See Wursthorn, supra note 951.

994. See Bechuck & Hirst, supra note 864, at 731.


996. See infra Section VI(f)(vi).
recent approval of “non-transparent” ETFs helps to alleviate index strategy duplication concerns.  

vi. Robo-Advisors and the “Democratization” of Wealth Management

Another factor fueling ETF growth is the popularity of “fintech” algorithmic wealth management platforms (or “robo-advisors”) which use low-fee ETFs in model portfolios.1001 Investor interest in robo-advisers transcend “the millennial set”, and now include much of the retail public.1002 Some fear that robo-advisors create ETF herding risk;1003 nevertheless, they represent a paradigm shifting “democratization” of wealth management - allowing the masses access to “diversified, affordable investment products” with essentially no account minimums.1004 This trend is widely facilitated by demographic changes, technological advancements, and “a shift in investor preferences” to passively managed structures like ETFs.1005 Alongside the emergence of low cost fintech wealth-management,1006 has been the brokerage commission and ETF fee war, both moving quickly to a zero fee environment.1007 The emergence of robo-advisors may also be increasing ETF issuer concentration, since they often promote widely held ETFs (like Vanguard).1008

1000. See Sheetz, supra note 966.
1001. See Evans & Ély, supra note 970.
1005. Eric Jansen, When a robo-advisor is, or isn’t, the right choice, CNBC (June 5, 2018), https://www.cnbc.com/2018/06/04/when-a-robo-advisor-is-or-isnt-the-right-choice.html [https://perma.cc/7DSL-Y2A7].
ETF issuers have strong growth incentives since “collective investment vehicles” (which includes ETFs) can be used for “shadow banking” activities.\textsuperscript{1006} The term “shadow banking” (or non-bank lending) is widely associated with the GFC.\textsuperscript{1007} Securities lending, along with CDS written on collateralized debt obligations (CDO), were two key elements of American International Group’s (AIG) failure in the GFC.\textsuperscript{1008} Since the GFC, it’s been estimated that global “shadow banks” (including ETF issuers) have increased their assets by over 75 percent to $52 trillion.\textsuperscript{1009} Securities lending has been called a “hidden source of return” for ETF fund sponsors,\textsuperscript{1010} even the “best-kept secret in the ETF business.”\textsuperscript{1011} Securities lending is not unique to ETFs – it’s been done for decades by other asset managers, like mutual funds and pensions.\textsuperscript{1012} The fee generating value of significant AUM from securities lending is so appealing that ETF issuers are willing to forgo fees (with “zero expense ratio” funds),\textsuperscript{1013} or even pay investors (the so-called “negative fee” funds).\textsuperscript{1014} Securities lending tends to be conducted by more profitable ETFs with underlying stocks which are in higher demand by short sellers.\textsuperscript{1015}

\textsuperscript{1006}. Jeff Cox, Shadow Banking is Now A $52 Trillion Industry, posing a big risk to the financial system, CNBC (Apr. 11, 2019, 5:01 PM), https://www.cnbc.com/2019/04/11/shadow-banking-is-now-a-52-trillion-industry-and-posing-risks.html [https://perma.cc/74MU-YFS7].

\textsuperscript{1007}. Id.


\textsuperscript{1009}. Cox, supra note 1006.


\textsuperscript{1012}. Id.

\textsuperscript{1013}. Eric Rosenbaum, Millennial online lender SoFi to offer zero-fee ETFs, an unexpected rival for index fund giants Vanguard, iShares, CNBC (Feb. 25, 2019, 1:44 PM), https://www.cnbc.com/2019/02/25/zero-fee-etfs-coming-but-not-from-vanguard-or-ishares-its-sofi.html [https://perma.cc/2MHV-L7UX].


\textsuperscript{1015}. Cigger, supra note 1011.
Another “structural factor” that Professors Bebchuck and Hirst cite in their recent critique of the growth of the “giant three” (BlackRock, Vanguard and State Street) is that “economies of scale” allow ETF issuers to seize market share at the expense of smaller firms. This is effectively an operational cost advantage – or as they note, “[a]n ETF with assets of $10 billion would have one hundred times the assets under management of an ETF with assets of $100 million tracking the same index, but the costs of operating the former would likely be much less than one hundred times the cost of operating the latter.”

Given this cost saving advantage these firms can reduce the operational costs of individual funds. Recent empirical evidence cited by these authors supports the argument of economies of scale in index funds, since certain fixed costs in running a fund (like administration, management, and commissions) can be spread over the entire fund issuer fund family.

d. How Do ETFs Facilitate Complex Economic Interconnections?

ETF firms facilitate complex interconnections with other financial institutions, banks, market participants, service companies, and retail and institutional investors. Their operational structure also connects these entities with each other and with retail and institutional investors. The scope of ETF-generated interconnectedness, and the risks originating from these heightened connections, enhances their systemic importance. Because indexing is appealing for retail investors, and ETF liquidity attracts institutional

1016. Bebchuck & Hirst, supra note 864, at 729.
1017. Bebchuck & Hirst, supra note 864, at 729.
1018. Bebchuck & Hirst, supra note 864, at 729.
1021. For a broad overview of the relationship between financial institution interconnectedness and systemic risk, see DTCC White Paper, supra note 913.
investors, it’s likely that the market will grow. As a result, three firms (BlackRock, Vanguard and State Street) will continue to increase in size and influence. This section will detail how ETFs, and the firms dominating their issuance, have created complex economic interconnections.

i. ETFs Connect Market Participants Through A Complex Operating Ecosystem

ETFs rely on the interaction of numerous external market participants, many of whom act with discretionary, non-binding, market incentives. A simple “physical replication” ETF is created when an “authorized participant” (AP) – which is normally a large broker dealer - transfers in kind a basket of securities (corresponding to the index structure published by the ETF issuer) to an ETF issuer in exchange for new ETF shares (and in a reverse process for the redemption of ETF shares). This is the ETF “primary market,” and retail investors can’t transact here. In the primary market the number of ETF shares are flexible (similar to a mutual fund) and are continually adjusted based on supply and demand. The ETF ecosystem also connects other voluntary market participants since APs will sell shares into the secondary market where

1028. Su, supra note 863, at 3-5.
1029. Su, supra note 863, at 4-5.
1030. SEC Subcommittee Report, supra note 977, at 4.
the bulk of trading activity takes place, and which is accessible by market makers, high frequency traders (HFT), and retail and institutional investors. APs have an incentive to perform an “arbitrage mechanism” to keep the net asset value (NAV) of the underlying assets in alignment with the ETF secondary market price. The ETF ecosystem connects other participants, such as derivatives dealers, for “synthetic” or other more complex structures (such as inverse or leveraged ETFs).

**ii. Connecting Corporations To Wall Street Through Proxy Voting Concentration**

ETF issuers sit intermediated between companies and investors, with the largest firms (BlackRock, Vanguard, and State Street) steadily increasing their proxy voting power over global businesses. There’s emerging evidence that ETF issuers rarely use this power, but frequently side with management, even on controversial issues like executive pay increases. A recent investigation noted that for the 300 worst performing companies in the Russell 3000 Index, BlackRock sided with management in 93 percent of its proxy votes, while Vanguard and State Street voted, respectively with management 91 and 84 percent of the time. This is problematic when you consider potential conflicts faced by these firms who “count on corporations to offer their funds to employees in retirement plans.” Therefore, a by-product of the indexing phenomenon is a concentration of voting power over U.S. public companies. As John Bogle - shortly before his death – wrote: “[i]f historical trends continue, a handful of giant institutional investors will one day hold voting control of virtually every large U.S. corporation. Public policy cannot ignore this growing dominance, and consider its impact on the financial markets, corporate

1031. BLACKROCK, A PRIMER, supra note 1027, at 7.
1035. Id.
1036. Id.
1037. Id.
governance, and regulation. These will be major issues in the coming era."\(^{1039}\)

iii. ETF Firms Connect Main Street To Bank Risk Taking and Potential Failure

Professor Yesha Yadav has identified that several of the world’s largest ETF issuers (BlackRock, Vanguard, State Street, Fidelity and T. Rowe Price) also happen to be the largest “block holders” of U.S. bank holding company shares.\(^ {1040}\) Post-crisis banking reform requiring heightened capital, facilitated greater asset manager equity exposure to banks.\(^ {1041}\) Thus retail investors, holding these asset manager’s products, “have assumed the residual default risk of large parts of the U.S. banking system.”\(^ {1042}\) Therefore, the need for ETF issuers to mitigate against excessive bank risk-taking is critical.\(^ {1043}\) Also, as the AUM of ETF firms grows, some question bank’s “raison d’être” altogether, and suggest that “buy side” firms like ETF issuers are “poised to replace banks as the major source of funding for deals and underwriting.”\(^ {1044}\) Further, asset managers hold large positions in competing banks, and a failure contagion across the banking industry would multiply loss exposure for retail investors.\(^ {1045}\)

ETF firms have immense influence through proxy voting, and written advocacy to management, but can’t sell the underlying shares unless an ETF index is adjusted.\(^ {1046}\) Yadav posits that asset managers “possess unique advantages, bringing a less risk-seeking model of equity investment to bank governance.”\(^ {1047}\) Unfortunately, it seems they infrequently “use that clout” to “discipline” corporate managers.\(^ {1048}\) Numerous scholars suggest that large asset managers are “afflicted by agency problems” and have “substantial incentives to be excessively deferential to the corporate managers of their portfolio companies.”\(^ {1049}\) Also, since there is “no mission to outperform market indices”

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1039. Id.
1041. Id. at 636.
1042. Id. at 621.
1043. Id. at 636.
1045. See Yadav, supra note 1040, at 636-37 (“[b]ecause they legally represent their funds at numerous large banks at once, the financial system is systemically impacted by the incentives, skills, and shortcomings of asset managers in exercising this governance power.”)
1047. Yadav, supra note 1040, at 637.
1048. McLaughlin & Kerber, supra note 1034.
1049. Bebchuk & Hirst, supra note 864, at 19; see also Lucian A. Bebchuk, Alma Cohen
they may lack incentives to ensure that companies comprising an index are “well-run.”\textsuperscript{1050} It’s also not clear how ETF issuers will exercise voting power when the interests of competing companies (that sit side-by-side in an index) are opposed, or when the interests of one company are unaligned with that of the larger economy.\textsuperscript{1051} Professor John Coates suggests that indexing firms can wield major influence, while achieving “scale” through the formation of “policies” that apply across companies, which are often discretionarily devised through consultations with interested stakeholders.\textsuperscript{1052}

\textbf{iv. Connecting Financial Firms To Each Other Through Shadow Banking and Securities Lending}

ETF issuers connect financial institutions to each other through shadow banking and securities lending.\textsuperscript{1053} The Financial Stability Board (FSB)\textsuperscript{1054} has identified ten “non-bank financial entities involved in shadow banking” post GFC in the Americas, including ETF firms.\textsuperscript{1055} Nonbank lending played a key

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\textsuperscript{1050} McLaughlin & Kerber, supra note 1034.
\textsuperscript{1053} See THE ECONOMIST, \textit{How Shadow Banking Works} (Febr. 1, 2016), https://www.economist.com/the-economist-explains/2016/02/01/how-shadow-banking-works [https://perma.cc/X6UB-HGVT] (describing the definition of the term “shadow banking” and how asset managers are engaged in this industry, “the term is used more loosely to cover all financial intermediaries that perform bank-like activity but are not regulated as one. These include mobile payment systems, pawnshops, peer-to-peer lending websites, hedge funds and bond-trading platforms set up by technology firms. Among the biggest are asset management companies. In 2013 investment funds that make such loans raised a whopping $97 billion worldwide.”)
\textsuperscript{1054} The Financial Stability Board (FSB) is an “international body that monitors and makes recommendations about the global financial system” established after the G20 London 2009 summit. FINANCIAL STABILITY BOARD, \textit{About the FSB}, https://www.fsb.org/about/ [https://perma.cc/QTK7-AGDZ] (last visited Nov. 4, 2019).
role in the GFC, particularly by AIG, and the FSOC’s non-bank SIFI declaratory power (which will be discussed in detail below) safeguards against this risk. Recent research shows that securities lending by ETF issuers in the U.S. has increased to levels unprecedented since the GFC.

Many ETF issuers engage in securities lending. An ETF sponsor can profit by lending a fund’s underlying securities to market participants like short-sellers. Elon Musk, among others, has been vocal against ETF issuers stimulating short selling through securities lending, and that ETF investors don’t realize the extent of these practices. BlackRock has defended against such allegations, suggesting securities lending benefits investors (since income is passed on in the form of lower fees), only generates a small amount of revenue, and doesn’t expose investors to extra risk. Short selling can also enhance liquidity and price discovery. The amount of lending profit returned to investors is contentious, and varies between issuers. A recent report noted Vanguard distributes almost all lending profits to investors, while others (like BlackRock) keep a higher proportion. Securities lending can also create new layers of complexity which may not be “offset” by the generated revenue.

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1056. Cox, supra note 1006.
1057. Schwarcz & Zaring, supra note 904, at 1827; McDonald & Paulson, supra note 1008, at 82-95.
1058. Center For American Progress, supra note 881.
1060. Braham, supra note 1010.
1061. Braham, supra note 1010.
1067. Crigger, supra note 1011; Attracta Mooney, Stock Lending By ETF Operators Worries...
ETFs connect institutional investors (like mutual and hedge funds, pensions and other institutional investors) with debtors, since fixed-income ETFs are being used as cash substitutes (due to high liquidity). In the case of a mutual fund holding a fixed income ETF it creates uncertainty if “funds can be sold off to pay fleeing clients in times of stress as seamlessly as the stewards of the $4 trillion market would like” – leading to frozen client withdrawals in a crisis. Other institutions look to short duration bond ETFs as “handy alternatives” to cash or money market mutual funds (MMMFs) which have more significant regulation post-GFC.

Prior to the GFC, MMMFs were viewed as cash substitutes that paid higher rates than bank deposits, however, prime MMMFs created systemic risk by investing heavily in commercial paper (CP) backed by subprime mortgage loans and other illiquid and largely opaque asset classes. On September 16, 2008 the Reserve Primary Fund (RPF) (the oldest MMMF in the U.S.) announced that it was “breaking the buck” and reducing its net asset value to below $1 per share because of exposure to $785 million of Lehman Brother’s CP, a move that precipitated a run on both the RPF and other MMMFs. The resulting market panic led to an immediate $85 billion loan to AIG (to prevent another major institution from failing), and the Fed providing nonrecourse discount window

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1069. Evans & Barrett, supra note 1068.
1071. See TIMOTHY F. GEITHNER, STRESS TEST: REFLECTIONS ON FINANCIAL CRISES, (New York: Broadway Books, 2014); 195-96, (stating that “[m]oney market funds were widely viewed as virtually indistinguishable from bank deposits as similarly safe vehicles for storing cash with slightly better interest rates”).
1074. Paulson, supra note 1073, at 233-41; Geithner, supra note 1071, at 194-97; McDonald
bank loans to purchase the toxic-asset backed CP from the MMMFs (a program that peaked at $150 billion exposure).\footnote{1075} In October 2008 the Fed and the Treasury provided additional support mechanisms for MMMFs, the CP market at large, and the “shadow banking” system.\footnote{1076}

ETF mega firms issue cash and MMMF substitutes, like BlackRock’s \textit{iShares Short Term Treasury Bond ETF}.\footnote{1077} Also, the ETF market has evolved to list “actively managed, ultra-short duration bond ETFs” seeking market share from the MMMF segment.\footnote{1078} Like MMMFs holding toxic-asset backed CP, these ETFs as cash substitutes could add to systemic risks depending on the composition of their fixed income baskets. The \textit{European Systemic Risk Board} (ESRB) has noted that “[l]arge swings in ETF prices may create systemic risk insofar as financial institutions hold large ETF positions on their balance sheets or rely heavily on ETF shares in their liquidity management operations.”\footnote{1079}

The coronavirus-driven market crash of March 2020 provides further evidence of ETFs being used as “cash-like” instruments.\footnote{1080} Flows from ETFs to MMMFs accelerated after the Federal Reserve launched its program to support MMMFs and commercial paper in the crisis,\footnote{1081} supporting the notion that

\begin{itemize}
\item[\footnote{1076}]{Zoltan Pozsar, Tobias Adrian, Adam Ashcraft, and Hayley Boesky, \textit{Shadow Banking, Federal Reserve Bank of New York Staff Report No. 458} (July 2010) at 61-64, \url{http://ssrn.com/abstract=1645337}. \url{https://perma.cc/8AB9-WARL}.
\item[\footnote{1077}]{
\begin{quote}
\end{quote}
\item[\footnote{1079}]{See ESRB Report, \textit{supra} note 988, at 28 (noting that “[i]n such circumstances, this excess volatility of ETFs relative to their constituent securities will translate into a more volatile net worth of financial intermediaries, which may trigger additional selling pressure in the ETF positions, thereby exacerbating ETF price drops.”)}
\item[\footnote{1081}]{See Sirio Aramonte & Fernando Avalos, \textit{The recent distress in corporate bond markets: cues from ETFs}, \textit{BIS Bulletin} No. 6 (Apr. 14, 2020), \url{https://www.bis.org/publ/bisbull06.pdf}. \url{https://perma.cc/55S5-ZLR7}.}
\end{itemize}
investors were using ETFs as short-term, and higher yielding, alternatives to MMMFs.

**vi. Moral Hazard, Conflicts and “Originate To Distribute” Models**

ETFs are also connecting investors and firms with a new form of “moral hazard.” Passive investing has been associated with moral hazard by promoting “laziness” and a “lack of sophistication” rather than a desire to outperform the market or “seeking alpha.” Some feel that holding the entire market indefinitely is an inferior investment strategy to those who actively “rebalance,” adjust allocations, and seek outperformance. Yet another (more subtle, but potentially destructive) form of ETF moral hazard may exist in the relationship between debt underwriters and ETF issuers. For example, the ESRB Report notes:

[t]he passive nature of ETFs in that they constitute investments in fixed-income products may in principle create a moral hazard problem in the issuance of such products: anticipating that they will be bought by ETFs, bond underwriters may forgo due diligence on such instruments, as was the case in the originate-to-distribute business model before the global financial crisis.

The firms that “devise” the underlying index can also have conflicts including threats from China to include their companies in basket compositions. The indexes themselves are susceptible to manipulation,

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1084. *Id.*
which could hurt investors. ETFs can also incentivize risky behavior in other financial institutions. Some ETFs invest in leveraged loans, and numerous ETF companies have recently signalled their intention to enter this market as well. Knowing that there is a market for leveraged loans, driven by ETF investor demand, financial institutions are incentivized to originate such products, and transfer the risk to ETF investors. There is a clear liquidity “mismatch” between the underlying leveraged loans (which are “traded infrequently” with long settlements) and the ETFs that hold them (which are considered highly liquid), further exacerbating the risk of a liquidity crunch in a crisis.

Another way that ETF issuers are connecting financial institutions to each other is in their fund structures. The ESRB Report reports that “[s]ynthetic ETFs are exposed to the risk that the swap counterparty is unable to fulfill its obligation to deliver the index return, while physical ETFs are exposed to counterparty risk through securities lending transactions, with the potential, in both cases, to generate fire sales in times of financial stress.” Some funds invest in other funds, thereby deepening the interconnection complexity and making the unwinding of the overall structure even more unpredictable in a crisis.
ETFs connect retail and institutional investors to each other. The ESRB notes that “ETFs can contribute to systemic risk by inducing investors to take correlated exposures that may trigger a chain reaction with systemic risk implications.” A 2013 report by the OFR (a division of the U.S. treasury) also assessed ETF’s impact on financial stability, and potential contagion selling in underlying assets, especially for ETFs with illiquid assets (like bonds). There is also a “herding” potential that gets exacerbated through ETF duplication as firms look to copy other’s index structures. The quick creation of new products could generate buying pressures by consumers not well suited to hold such risk exposure (like ETFs that replicate complex trading strategies used by hedge funds). In a crisis, once risks materialize, investors could quickly sell their ETFs. Another potential scenario is a “run” on a big asset manager (like BlackRock) where all secondary market fund holders simultaneously liquidate their holdings. There is also an emerging, and unsettled, debate on the price distorting and volatility enhancing impact of ETFs on underlying securities.

Mutual funds holders can interact directly with a mutual fund issuer and redeem their fund units at NAV, because of *Investment Company Act*

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1096. *See Office of Financial Research, About the OFR,* https://www.financialresearch.gov/about/ (last visited Oct. 10, 2019). The Office of Financial Research was instituted pursuant to post crisis reform (the *Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010* ) to “promote financial stability by looking across the financial system to measure and analyze risks, perform essential research and collect and standardize financial data.”
1098. *Id.* at 10-11.
1099. *Id.* at 9.
1102. Dellinger, *supra* note 862.
provisions governing open-end management investment companies.\textsuperscript{1105} Likewise, MMMFs are generally redeemable at a “stable” NAV ($1.00 per share); however, post-crisis rules designed to mitigate MMMF runs have adjusted these rules somewhat by introducing a “floating NAV” provision to account for underlying securities daily prices (rather than a $1.00 “stable share price”) on MMMFs that invest in corporate debt.\textsuperscript{1106}

ETF investors can’t transact directly with the fund sponsor to redeem their shares at the underlying NAV.\textsuperscript{1107} They must sell them into the secondary market (and find a willing counterparty), so in a panic they could be “trampled by the herd.”\textsuperscript{1108} The ETF redemption process is only available to a small number of “designated” authorized participants or “APs” who redeem ETF shares in “large blocks” and are incentivized through an arbitrage mechanism to eliminate price differences in the ETF secondary market and the underlying NAV.\textsuperscript{1109} Even though only APs can redeem ETFs there are still concerns that in a crisis or run on an ETF issuer, it won’t be able to satisfy AP redemption requests.\textsuperscript{1110}

Individual firms within the ETF operating ecosystem may be an independent source of risk since high levels of concentration in the industry can induce both operational and fire sale risk.\textsuperscript{1111} The failure of a large ETF firm, or AP, could “amplify or transmit risks to other parts of the financial system.”\textsuperscript{1112} In a “stressed market” an ETF sponsor could face many redemption requests from APs,\textsuperscript{1113} or an AP withdraw, if the value of the secondary market ETFs

\begin{footnotesize}
\begin{enumerate}
\item \textsuperscript{1106} See Kuhu Parasrampuria, S\textsc{éc}\textsc{’}s New Money Market Rules, 36 Rev. Banking & Fin. L. 2, 2-3 (2016) (noting that in addition to the “floating NAV” the reforms “also impose fees and redemption gates, which temporarily prohibit investors from withdrawing their investments in MMFs.”)
\item \textsuperscript{1107} See \textsc{Fidelity, Understanding How Mutual Funds, ETFs and Stocks Trade}, \textsc{Fidelity Learning Center}, https://www.fidelity.com/learning-center/trading-investing/trading/trading-differences-mutual-funds-stocks-etsf [https://perma.cc/NL56-2VLH] (last visited Nov. 4, 2019) (explaining the structure of funds trading).
\item \textsuperscript{1108} See Paul Amery, \textit{Will Investors Be Trampled By The Herd?} \textsc{Financial Times} (Sept. 11, 2016), https://www.ft.com/content/be19405a-652c-11e6-8310-ecf0bdddad227 [https://perma.cc/JPF9-DB76] (outlining the risks associated with herd behaviour when trading ETF funds).
\item \textsuperscript{1109} See Hu & Morley, \textit{A Regulatory Framework}, \textit{supra} note 1026, at 873 (explaining the regulation around structured arbitrage in ETF trading).
\item \textsuperscript{1110} Amery, \textit{supra} note 1108.
\item \textsuperscript{1111} See \textsc{OFR Report}, \textit{supra} note 1096, at 3.
\item \textsuperscript{1112} \textsc{OFR Report, supra} note 1096, at 18.
\item \textsuperscript{1113} \textsc{OFR Report, supra} note 1096, at 12.
\end{enumerate}
\end{footnotesize}
deviated significantly from the value of the underlying fund assets.\textsuperscript{1114} AP redemption \textit{en mass} could also spread selling pressure to the underlying assets themselves,\textsuperscript{1115} and then back to the ETF secondary market in what’s been described as a fire sale “feedback loop.”\textsuperscript{1116}

\paragraph*{viii. Interconnecting Market Service Providers Through The ETF Ecosystem}

Asset managers have business relationships with a host of financial intermediaries and market participants including (among others) banks, insurance companies, broker-dealers and financial service providers through their securities lending arrangements.\textsuperscript{1117} They use third party services like pricing services, benchmark providers, security data providers, custodians, transfer agents, and technology platforms.\textsuperscript{1118} Many of these service providers have common clients adding another layer of connectivity.\textsuperscript{1119} Service providers in the ETF ecosystem facilitate regulatory compliant back office and settlement operations.\textsuperscript{1120} Some ETFs also contract “distributors”\textsuperscript{1121} to take orders from the APs and, often, to act as the liaison between the ETFs transfer agent and the APs.\textsuperscript{1122} In addition to APs, other firms are involved in the operation of an ETF.

\begin{footnotesize}
\begin{itemize}
\item \textsuperscript{1115} See Ian Foucher & Kyle Gray, \textit{Exchange-Traded Funds: Evolution of Benefits, Vulnerabilities and Risks}, BANK OF CANADA FINANCIAL SYSTEM REVIEW (Dec. 2014) at 42 (“APs can also transmit liquidity shocks from the ETF to the underlying assets (and vice versa). As ETFs and the underlying market become more interconnected, a small liquidity shock originating in either the ETF or the underlying securities could be amplified through a feedback loop (via APs). This could result in a large liquidity shock and a reduction in price informativeness for both the ETF and the underlying market.”)
\item \textsuperscript{1116} Id.
\item \textsuperscript{1117} See OFR Report, supra note 1096, at 15.
\item \textsuperscript{1119} See OFR Report, supra note 1096, at 21.
\item \textsuperscript{1120} See ETF.COM, \textit{So You Want To Launch an ETF?} (July 1, 2006), https://www.etf.com/publications/journalofindexes/joi-articles/2305.html?nopaging=1 [https://perma.cc/9UP2-X2F5].
\item \textsuperscript{1121} See KPMG, \textit{ETF Playbook Glossary – Ecosystem of ETF Industry Roles}, 2-3 (2016), https://home.kpmg/content/dam/kpmg/us/pdf/etf-playbook-glossary.pdf [https://perma.cc/NG7S-258H] (“Distributors have the role of conducting sales support for an ETF. For example, the distributor will reach out to brokerage firms, registered investment advisors (RIAs), retirement plan owners to introduce the ETF to them, and support inclusion of the ETF into sell-side ETF inventories. In some cases the ETF sponsor will act as the distributor, especially if it has existing fund wholesaler resources. Smaller ETFs, however, are more likely to utilize the services of a distributor since they typically lack a dedicated sales force.”)
\item \textsuperscript{1122} See ETF.com, supra note 1120.
\end{itemize}
\end{footnotesize}
including depositories, custodians, record keepers, transfer agents, index providers, exchanges, auditors, legal counsel, and administrators who provide technology, financial, regulatory or operational support.\textsuperscript{1123} The interconnected relationships with other financial market service companies could have the effect of “expos[ing] asset managers to risks that arise in other market sectors.”\textsuperscript{1124} External risk exposure, from service company interconnection can also arise from an ETF mega issuer who offers “ancillary services.”\textsuperscript{1125}

\textit{ix. The Interconnective Influence of BlackRock’s “Aladdin” Modelling Program}

Another way that BlackRock in particular is connecting the financial system is through its \textit{Aladdin} computer system.\textsuperscript{1126} A recent \textit{European Banking Institute} study calls Aladdin a “financial operating system,” and among “the most consequential and unexamined developments in global finance.”\textsuperscript{1127} Aladdin literally fills “warehouses” with hardware and is used not just by BlackRock’s extensive employee army but also by thousands of clients who pay for access.\textsuperscript{1128} There are emerging concerns that the widespread use of Aladdin by other market participants is creating systemic risks through correlated investment exposures.\textsuperscript{1129} The reach and influence of Aladdin’s financial modeling is extensive, with an “effect on the management of ten percent of the world’s financial assets, or around $20 trillion.”\textsuperscript{1130} This vast influence has led some to be concerned about the “unprecedented” influence of a single firm, which could also generate investor herding since many of the world’s largest sovereign wealth funds rely on Aladdin’s modeling.\textsuperscript{1131} The Federal Reserve also procured the services of BlackRock to manage its \textit{Secondary Market Corporate Credit...
Facility in response to the coronavirus, and BlackRock will utilize Aladdin in this capacity, further evidencing its influence.\textsuperscript{1132}

x. ETF Firms Connecting Global Economies

Mega ETF firms are interconnecting investors, companies, countries and even employees throughout the globe. BlackRock has seventy offices in more than thirty countries and manages assets for clients in North and South America, Europe, Asia, the Middle East, Africa and Australia.\textsuperscript{1133} Vanguard has reported, as of August 31, 2019, having 220 funds in markets outside of the U.S. with more than thirty million investors in 170 countries.\textsuperscript{1134} Industry trends point towards “outsourced solutions” for operational and “back office” functions like “fund administration, accounting and transfer agency.”\textsuperscript{1135} This connects ETF firms to other service providers, many of whom also have global operations. BlackRock’s \textit{Aladdin Implementation} has been specifically referenced in focusing on a “global operating model.”\textsuperscript{1136}

v. Could ETF Interconnectivity Contribute to Systemic Risk?

This section will explore how ETF driven interconnectivity could contribute to systemic risk and influence financial crises. A variety of taxonomies characterize the transmission of systemic risk in financial crises. For example, Professors Jeremy Kress, Patricia McCoy and Daniel Scharcz identify two transmission mechanisms: “counterparty” transmission and “asset liquidation.”\textsuperscript{1137} For the purposes of simplicity this article will use a simple “direct” and “indirect” description, with numerous sub-components for each element of transmission.

\textsuperscript{1136} \textit{Id.}
\textsuperscript{1137} Kress, McCoy & Scharcz, \textit{supra} note 874, at 14.
a. Direct Transmission of Systemic Shocks

i. ETF Fire Sales and Underlying Asset Liquidation Contagion

Liquidity shortages in ETFs could magnify a crisis fallout. Asset managers, even as financial agents, can “create or amplify systemic risk” if they generate a “procyclical” impact on the financial cycle and induce contagion across other financial sectors. The IMF, in its April 2019 *Global Financial Stability Report*, noted that ETFs may be driving liquidity “mismatch” and increasing the “likelihood of herding” both impacting liquidity demand. They also may be attracting short term volatility traders. For example, in 2013 when the Federal Reserve proposed ending its quantitative easing program, short term traders aggressively sold fixed income ETFs, impacting the yield spreads of the underlying bonds. Also, in the “flash crash” of 2010 ETF prices diverged significantly from their NAV.

Professors Henry Hu and John Morley describe the starting point for ETF generated systemic risk as an impairment of the “expectations of easy exit.” Since many participants, who are relied on to support the ETF trading ecosystem (such as APs and market making firms), are driven by their own independent profit-seeking motives, it is uncertain whether they can be relied on to provide a “backstop” against panicked selling in a crisis. APs may halt the process of redeeming or creating ETFs leading the ETFs themselves to trade as closed end.

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funds, and the secondary market price deviating from the NAV, with HFT and other market makers either widening their bid-ask spreads or leaving the market. Investors could also look to pre-empt AP departure by shorting ETFs.

ETFs are an attractive mechanism for “pessimistic” short sellers to “speculate or hedge.” ETF short sellers can add to pro-cyclical selling in a crisis, and empirical evidence suggests that “difficult to mimic underlying indexes” are more commonly the target of shorts with physical and synthetic ETFs having “equal changes to be sold short.” Also, ETFs allow for the construction of “synthetic short[s]” of illiquid individual index component securities (for example by shorting an ETF and then buying long only some parts of the index), and this could also exacerbate fire-sell pressures on certain stocks in a crisis. Disappearing intermediaries can also affect liquidity in underlying asset classes which can exacerbate sell-offs and lead to contagion. Some worry that liquidity shortages in ETFs could generate sell-offs in other asset classes, including peer firm ETFs, as investors who can’t sell their ETF shares (or can only sell them at steep discounts) will move quickly to liquidate other investments. This could also create a “feedback loop” as coordinated selling drives prices downward in both the ETF secondary and underlying asset markets. This is particularly relevant for the growing segment of institutional

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1148. See Božena Chovancová, Michaela Dorocáková & Dagmar Linnertová, Two Investment Options For Bearish ETF Investors: Inverse ETF and Shorting ETF, 7(31) INT. J. FINANCIAL STUD. 2019 at 13.

1149. See Deev & Linnertova, supra note 1147, at 673.


1151. Elstein, supra note 1144.

1152. Elstein, supra note 1144.

1153. See Foucher & Gray, supra note 1115, at 42 (“APs can also transmit liquidity shocks from the ETF to the underlying assets (and vice versa). As ETFs and the underlying market
investors that look to ETFs as cash substitutes. Relatedly, recent empirical research shows that ETF sell-offs have a greater effect on underlying bond prices than mutual fund sales.

ii. Discretionary Incentives and ETF Arbitrage Malfunction

APs have a market-based profit incentive to perform arbitrage, which acts to simultaneously align the ETF share price and its underlying NAV. APs have no legal obligation, to perform this arbitrage. APs are driven by discretionary and market-based incentives, and it’s uncertain how they are going to react in a crisis, including withdrawing from performing the ETF “arbitrage mechanism.” Discretionary liquidity has proven elusive in prior crises (in both the portfolio insurance market in 1987 and in the auction rate securities market in the GFC). The Central Bank of Ireland has also noted that a “stress event” at a large AP could impact ETF liquidity. If MM or AP firms consolidate, it would reduce the number of APs who could remedy liquidity

become more interconnected, a small liquidity shock originating in either the ETF or the underlying securities could be amplified through a feedback loop (via APs). This could result in a large liquidity shock and a reduction in price informativeness for both the ETF and the underlying market.”

1154. See ESRB Report, supra note 988, at 3.
1155. See C. Dannhauser & S. Hoseinzade, supra note 1141.
1156. See BLACKROCK, A PRIMER, supra note 1027, at 2-3
1157. See Antoniewicz & Heinrichs, supra note 1027, at 1-2.
1161. There is some evidence that the market for AP ETF arbitrage is, however, growing more robust with additional competition; see Siobhan Riding, Watchdogs Probe Systemic Risks of Passive Fund Growth, FINANCIAL TIMES (Mar. 31, 2019),
shortages, since liquidity is often “fragile” during a crisis. Further, HFT and other liquidity providers may “pause” in a stress event and withdraw from the market if the arbitrage mechanism leads to a decoupling of the ETF price and its NAV.

In a report released before the coronavirus market crash, the UK’s Financial Conduct Authority (FCA) modestly rebutted contentions of fixed-income ETFs as a “threat to financial stability” due to liquidity mismatches, citing the “resilience” of discretionary liquidity providers during periods of post-crisis market stress. They acknowledge, however, emerging risks in the sector including “highly concentrated” markets for liquidity providers and authorized participants. Further, the FCA qualifies its support for discretionary liquidity providers as “preliminary” with “tentative evidence” during times of stress, and acknowledge the need for more research. Others have countered that a true crisis, or market selloff, hasn’t happened since 2008, and ETFs as a nascent but quickly growing asset class haven’t been truly tested. Additionally, the IMF in its April 2019 Global Financial Stability Report, highlights the growing risks of liquidity mismatches.

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1163. See Su, supra note 863, at 17 (illustrating how market makers “paused” their activity in ETFs during the May 2010 flash crash).


1166. Id. at 4 (“There is a high level of concentration among APs. The 5 most active APs are responsible for about 75% of overall reported primary market volumes (across all asset classes). Concentration is particularly pronounced in the fixed income market, with the top 5 APs there accounting for around 91% of overall volumes and the top AP itself accounting for 51%”).

1167. Id at 4.

1168. Id. at 13.

1169. See DB Report, supra note 1033, at 79.

1170. IMF, supra note 1140, at 12; see also IMF, supra note 1140, at 50 (“ETFs offer investors a liquid instrument with exposure to a portfolio of securities with varying liquidity and risk characteristics. The increasing participation of mutual funds and ETFs in less liquid markets may have increased their liquidity mismatches.”)
In March 2020, coronavirus-related fears caused a significant market sell-off, with ETFs quickly becoming a crisis trading “tool of choice” (with some investors even using them as “substitutes for futures”). Before the Federal Reserve announced its sweeping stimulus measures in response to the crisis, many ETFs (particularly corporate bond funds) traded at “steep discounts” from their net asset value, and a lack of dealer support in the underlying bond market was cited by researchers from Bank for International Settlements among the contributing factors leading to an impairment of ETF arbitrage and creating price distortions. Bond ETF price dislocations during the coronavirus crisis show just how precarious ETF arbitrage can be, especially since a credit ETF can be traded much faster than its underlying bonds.

iii. Securities Lending Fallout and Counter-Party Default Risk

Securities lending can transmit systemic shocks in several ways. Loan collateral could be “mismatched” with lent securities (like equities held against bonds). In a crisis the lent securities could deviate in value from the collateral and expose ETF fund holders to loss. It’s been reported that BlackRock’s iShares Core UK Gilts, an ETF tracking Sterling denominated UK government bonds, “has about two-thirds of the fund on loan at any one time and accepts

1172. See Aramonte & Avalos, supra note 1081.
1175. See BlackRock, Securities Lending, supra note 1063, at 3.
1176. See id.; In the 2008 global financial crisis AIG experienced a mismatch in its security lending transactions since they often provided corporate bonds as collateral against loans that were invested in riskier, and in some cases illiquid securities such as CDOs and other mortgage-backed securities, see McDonald & Paulson, supra note 1008 at 84-87.
equities and other ETFs as collateral." Post GFC rules in the U.S. require loans to be “overcollateralized” (102 percent for U.S. securities and 105 percent for international) and also limit the amount of a fund’s underlying assets that can be lent out to one-third of the fund assets.)

An ETF firm will also invest cash collateral. U.S. rules curtail the level of risk that an ETF firm can take on with their cash collateral investments, yet a debtor could quickly return the borrowed securities and demand their cash collateral, forcing the lender to liquidate their investments at a loss. This problem gets “exacerbated” if the invested securities have decreased in value themselves, or are experiencing liquidity shortages. ETF securities lenders also expose their investors to counter-party risk (with greater exposure for synthetic ETFs). Borrowers in a securities lending transaction with an ETF firm could fail in a crisis and the borrowed securities could be difficult to recover. ETF firms also contract with independent “lending agents” to facilitate securities lending transactions, and they could be materially affected if one of these lending agents experiences significant distress in a crisis.

Correspondingly, if a large ETF firm experienced material financial distress or failure, and defaulted on its contractual obligations, negative pressure would be put on contractual counterparties, which could trigger a “chain-reaction” of negative events. This impairs financial stability if counterparties (and the financial system) are under stress, and experiencing concurrent losses. It would cause disruption to ETF investors as well because, even though client

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1178. Mooney, supra note 1067.
1180. Mooney, supra note 1067.
1181. See Tepe, supra note 1174, at 863.
1182. Tepe, supra note 1174, at 863-864.
1185. See McCullough, supra note 1179.
1187. Kress, McCoy & Schwarcz, supra note 874, at 1470-71 (discussing the transmission of systemic risk in a financial crisis through the “counterparty channel” when one firms distress, default or failure affects other interconnected firms who may be experiencing similar distress).
assets are “excluded” from the estate of a bankrupt asset manager,\(^{1189}\) the resolution of an ETF firm could create delays and litigation for clients to recover assets.

**iv. Operational Disruption and Informational Opacity**

ETF firm “operational risks” could create disruption and informational opacity.\(^{1190}\) As noted by the ESRB, investor behavior can be affected if an ETF issuer experiences “frictions in their operations” like an arbitrage malfunction.\(^{1191}\) The ESRB posits that, although operational risk does not normally generate systemic considerations, “in a highly concentrated segment like that of ETFs” an operational event at one firm can create “mistrust among investors towards the whole segment and thus widespread sales.”\(^{1192}\) The domino effect from an adverse operational event at one of the mega-asset managers with significant ETF market share is, in many ways, analogous to the growing post-GFC fragilities in the central clearing of derivatives, where a small number of global banks now hold the reserves of the world’s largest clearing facilities, and the failure of one of these derivatives dealers could jeopardize the solvency of major clearinghouses.\(^{1193}\) Large institutions (financial or otherwise) could be also disrupted if ETFs are held on their balance sheets as “cash substitutes.”\(^{1194}\) Finally, an ETF investor who finds themselves holding the funds of a failed issuer could receive a cash distribution (provided there are sufficient assets to meet creditor demands) but only after the underlying assets are liquidated in what could be a lengthy, litigation filled, and uncertain process.\(^{1195}\)

**b. Indirect Transmission of Systemic Shocks**

**i. Contagion Selloffs in Other ETF Fund Sponsor Products**

If a single ETF mega firm experienced material distress, investors who own funds of competitor firms may panic – and distrust in the “whole segment” of

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1189. See BlackRock Letter to FSOC, *supra* note 1118, at 5 (describing the agency nature of ETF issuers).  
the market could lead to fire sales.\textsuperscript{1196} Such an event can induce a form of “prisoners dilemma”\textsuperscript{1197} where investors rush to sell their funds (of any issuer) because they are unaware of the financial status of a particular ETF issuer.\textsuperscript{1198} This is analogous to a bank run when depositors of one bank may witness the material distress of a peer bank (where they don’t have deposits) but choose to withdraw from their own bank because they are nervous that their bank may also be in jeopardy.\textsuperscript{1199} This is also an example of what Andrew Haldane describes as fragility onset through “homogeneity” in financial product holdings.\textsuperscript{1200} As more and more investors hold passive index products, a counterintuitive phenomenon emerges: an individual’s attempt at “diversification” (though an index fund) when enacted collectively, creates homogenization of the market as a whole.\textsuperscript{1201} As Haldane notes, homogenized financial systems can be unpredictable in a crisis, since diversity strengthen the “durability” of the whole system.\textsuperscript{1202}

\textit{ii. The Formation of Investor Herds and Flight to Quality}

ETFs could contribute to the formation of investor herds in a crisis. An ETF is a “momentum strategy” and underlying assets are purchased when ETF investor money “flows in” and underlying assets are sold when investor money “flows out.”\textsuperscript{1203} With ETFs, speculators can trade across multiple markets “unhinged” from the intrinsic value of the constituent securities.\textsuperscript{1204} Herd formation is influenced by the “co-movement” of asset prices since investors face simultaneous loss (as they have invested in the “systemic” rather than idiosyncratic components of risk).\textsuperscript{1205} Further, ETFs attract “directional traders” like HFT to take positions on entire asset classes, which both increases the volatility of constituent securities,\textsuperscript{1206} and can drive investor “directional”

\begin{itemize}
  \item \textsuperscript{1196}See ESRB Report, supra note 988, at 31.
  \item \textsuperscript{1197}See Andrew Postlewaite & Xavier Vives, Bank Runs as an Equilibrium Phenomenon, 95(3) J. of POL. ECON. 485, 485-486 (1987) (discussing a bank run that illustrates a prisoner’s dilemma).
  \item \textsuperscript{1198}See ESRB Report, supra note 988, at 31.
  \item \textsuperscript{1199}See Postlewaite & Vives, supra note 1197, at 485-486.
  \item \textsuperscript{1200}See Haldane, supra note 901, at 3-4, 9-10.
  \item \textsuperscript{1201}Haldane, supra note 901, at 3-4, 9-10.
  \item \textsuperscript{1202}Haldane, supra note 901, at 9-10.
  \item \textsuperscript{1203}Thomas, supra note 866.
  \item \textsuperscript{1205}ESRB Report, supra note 988, at 19; see L. R. Glosten, S. Nallareddy & Y. Zou, ETF trading and information efficiency of underlying securities, COLUMBIA BUSINESS SCHOOL RESEARCH PAPER, No 16-71 (2016).
  \item \textsuperscript{1206}See I. Ben-David, F. Franzoni, F. & R. Moussawi, Do ETFs increase volatility? 73(6) J. of FIN., 2471 (2018).
\end{itemize}
Herds can form in many ways in ETFs. Investors who hold exotic ETFs, or fixed income ETFs, could also look to liquidate their holdings in a herd-coordinated “flight to quality.” ETFs that use leverage or “rule-based trading strategies” have procyclical potential. A bear market sell-off in ETFs could also generate a collective fire-sale in the underlying assets. A “stress event” affecting a large AP or market maker could also trigger an ETF investor herd. Similarly the failure of the arbitrage mechanism could drive a coordinated fire-sale and other debilitating “chain reactions.” Additionally, an ETF firm experiencing financial or operational disruption (or in the grips of a fraud or other scandal) can also find itself subject to a run, similar to a bank run, as investors liquidate firm sponsored ETFs.

iii. Impact on Pensions, Institutional and Retail Investors

A low-interest environment, post-GFC, has caused institutional investors to “search for yield,” through products like ETFs, and in a crisis a simultaneous sell-off could “amplify shocks.” The IMF recently noted in a October 2019 Global Financial Stability Report the “increasing holdings of riskier and more illiquid assets by institutional investors” in the face of declining interest rates. The report posits that as institutional investors seek out profit opportunities, correlated investment fund portfolios could “amplify market sell-offs” – and that this dynamic is contrary to the “traditional role they play in stabilizing markets

1207. ESRB Report, supra note 988, at 20-1.
1209. See ESRB Report, supra note 988, at 22-3.
1211. See CBI Feedback Statement, supra note 1160 at 11.
1213. ESRB Report, supra note 988, at 31.
during periods of stress.”

ETFs have also become increasingly exotic in variety. In the midst of a market panic investors may look to sell some of the exotic funds and crowd into safer asset classes, triggering an investor herd and contagion in both the exotic funds, and their underlying assets.

iv. Redemption Runs on Mutual and Open-Ended Funds Issued by ETF Firms

Large ETF issuers also offer mutual funds. Investors in a crisis-driven information cascade could look to early redemptions thinking it will provide an “economic advantage” since late redemptions could be exposed to a “less liquid” underlying portfolio. However a number of risks emerge if a bottleneck of redemptions occurs for mutual funds offered by ETF issuers. First, investors could be “gated” and unable to redeem mutual fund units, similar to the recently controversial Woodford funds in the U.K. Fixed income funds have also been shown in one study to act similarly due to being evaluated based on “relative performance.” Thus similar performing funds could facilitate coordinated redemption requests across fund companies.

v. Material Risk Transmission to Real Economy and Impacts on Corporate Behavior

The impact of ETF (and underlying asset) fire sales, and investor collective actions, can transmit shocks to the real economy and influence corporate behavior. Empirical evidence suggests that when equity fund-originated firesales of firm shares cause an underpricing of the firms, they tend to respond with

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1217. Id. at 3-4.
1219. ESRB Report, supra note 988, at 20.
1221. OFR Report, supra note 1096, at 12-6.
1222. See Owen Walker & Peter Smith, Neil Woodford Slams the Gate in Investors’ Faces, FINANCIAL TIMES (June 3, 2019), https://www.ft.com/content/ee03bc4a-8627-11e9-97ea-05ac2431f453 [https://perma.cc/KJ89-J56K] (describing the Woodford funds controversy in the UK in which investors were unable to redeem mutual fund units).
a correspondingly lower level of investment and employment than their industry competitors. Similarly there is evidence of a “noisy” information effect causing firms to reduce their own capital investment when their product-market peers experience a stock price depreciation due to “non-fundamental” information (for instance based on a fire sale). This is because corporate managers struggle to filter the signal from the noise in their peer’s stock price, and the resulting loss of investment can be significant, even for firms that are not otherwise under financial constraints. Also, trading flows in corporate bonds can impact new corporate debt issuance decisions.

vi. The Challenge of Regulating Highly Interconnected ETF Firms

As previously noted, the operations of large ETF firms foster deep and complex interconnections and could facilitate both indirect and direct financial shocks during a crisis. Hence there has been a post-GFC heightened focus on their potential systemic importance. This section will canvass the complexity of that question by assessing the challenge in applying bank-like prudential oversight to ETF firms, the limitations in applying the FSOC’s proposed “activities-based” rules for non-bank SIFIs to ETF issuers, and a variety of other alternative regulatory considerations and important developments to monitor.

a. Post-Crisis Non-Bank Systemically Important Financial Institution Designation

FSOC was created by The Dodd Frank Wall Street Reform and Consumer Protection Act (DFA) for several aims, including to “identify risks

1229. See generally ESRB Report, supra note 988; OFR Report, supra note 1096; FSB Structural Vulnerabilities, supra note 936.
to the financial stability of the United States that could arise from the material financial distress or failure, or ongoing activities, of large, interconnected bank holding companies or nonbank financial companies.\textsuperscript{1233} The DFA gives FSOC authority to determine whether a “nonbank financial company’s material financial distress – or the nature, scope, size, scale, concentration, interconnectedness, or mix of its activities – could pose a threat to U.S. financial stability.”\textsuperscript{1234} Pursuant to Section 113 of the DFA, the FSOC can make a “determination” that a nonbank financial company be subject to Federal Reserve supervision and prudential controls.\textsuperscript{1235} If designated as a non-bank SIFI, a firm will be “subject to consolidated supervision and regulation by the Federal Reserve, including risk-based capital, leverage, liquidity, and risk management requirements.”\textsuperscript{1236} These standards are more onerous than a standard non-bank’s “baseline regulatory regime.”\textsuperscript{1237} A variety of “macroprudential tools” are also available to the Federal Reserve to ensure that the declared non-bank SIFI doesn’t transmit systemic risk “through the broader economy.”\textsuperscript{1238}

In 2013, American International Group, Inc. (AIG), General Electric Capital Corporation, Inc. (GE), and Prudential Financial, Inc. (Prudential) were designated non-bank SIFIs,\textsuperscript{1239} followed by a similar declaration for Metlife, Inc. (Metlife) in 2014.\textsuperscript{1240} In 2016 FSOC de-designated GE after the firm altered its risk profile and sold off certain assets.\textsuperscript{1241} This was followed by AIG being de-designated in 2017 after undertaking similar activities.\textsuperscript{1242} Metlife had initially sued FSOC over its status,\textsuperscript{1243} and won in district court by shrinking its insurance...
business. In early 2018, FSOC withdrew its appeal against Metlife. The final institution to shed the label of a non-bank SIFI was Prudential, which was de-designated in 2018.

b. Applying FSOC’s “Activities-Based” Guidance to ETF Firms

Under the revised guidelines FSOC will only pursue an entity specific determination under Section 113 of the DFA if “a potential risk or threat cannot be addressed through an activities based approach.” Before proceeding with a designation, FSOC will also perform a cost-benefit analysis (CBA), and only proceed if the benefits outweigh the possible costs. It’s highly unlikely the FSOC’s revised framework will capture asset managers like ETF firms. Therefore, despite their size, growth, and complex interconnectedness none of the “giant three,” even the largest of all - BlackRock - will likely be legally “too big to fail” in the U.S. any time soon. This is welcomed by BlackRock, who lobbied heavily against enhanced supervision, and Vanguard, who lauded the FSOC’s changes. Both firms have battled the “too big to fail” label for most of the decade. They strongly rejected previous

1245. Kress, supra note 1236 at 174; see also Alistair Gray, Trump Administration Drops Appeal in MetLife ‘Too Big to Fail’ Case, FINANCIAL TIMES (Jan. 19, 2018), https://www.ft.com/content/cfc31764-ff65-351d-95f2-78e7b413af4f [https://perma.cc/2JPUELXH].
1247. FSOC Proposed Rules, supra note 1230, at 9028.
1248. FSOC Proposed Rules, supra note 1230, at 9029
1250. Bebchuck & Hirst, supra note 864.
1251. See Loomis, supra note 1046.
suggestions by the OFR,\textsuperscript{1255} in a 2013 report that they posed a “too big to fail” systemic risk.\textsuperscript{1256} Also, both firms signal that the costs of enhanced regulatory scrutiny, due to a non-bank SIFI designation, would likely flow through to investors in the form of higher fees.\textsuperscript{1257}

c. Counter Arguments Against Heightened ETF Issuer Regulatory Scrutiny

BlackRock and Vanguard strongly opposed previous attempts by the Financial Stability Board (FSB) to suggest the application of bank-like regulatory parameters to asset managers;\textsuperscript{1258} advocating (and lobbying) strenuously that their operational structure was distinguishable from banks or insurance companies and that heightened Federal Reserve oversight, and non-bank SIFI controls, were inapplicable and an unnecessary regulatory burden.\textsuperscript{1259} BlackRock in particular has ushered extensive support for a “products and activities” approach to addressing risks in asset management.\textsuperscript{1260} This section will review the key arguments that are levied against prudential supervision for ETF issuers.

i. Agency Function and Balance Sheet Distinctions From Banks and Insurance Companies

The primary counter-argument against an asset manager being a non-bank SIFI is that it’s “fundamentally different” than a bank, or an insurance company,

\begin{itemize}
  \item [1256] See also Chris Flood, BlackRock fights ‘too big to fail’ fears, Financial Times (Nov. 4, 2013), https://www.ft.com/content/e79d2280-4553-11e3-b98b-00144feabdc0 [https://perma.cc/4KYY-68FZ].
\end{itemize}
because it acts as an “agent” or “advisor” on behalf of its investors. BlackRock submits that its role is a “provider of services” for a fee. Relatedly, asset managers have significantly smaller balance sheets than banks and insurance companies, and other than securities lending operations don’t act as primary lenders. An ETF firm’s assets are not acquired through leverage (unlike bank deposits), and an asset manager doesn’t have access to “central bank liquidity.” The largest ETF issuers use significantly less leverage than deposit taking banks. Also, if an ETF issuer failed, an ETF’s underlying assets could be transferred to a new custodian. As such, BlackRock describes its role in the ETF business as a “highly constrained fiduciary on behalf of the asset owner,” and if it fails to return monies to a client it doesn’t require a “disentangling from the asset manager’s own assets.”

ii. ETF Substitutability and Non-Critical Functionality

Substitutability is a factor in FSOC non-bank SIFI determinations, and asset managers, even the ETF mega-firms, argue that other firms can provide similar products and services, and that this mitigates against the need for heightened prudential oversight. Substitutability generally refers to whether there are “readily available alternatives” to a financial product or service, or how hard is it to find a replacement to what the firm is providing in the marketplace? As the argument follows, an index based ETF is highly substitutable, and thus applying “bank centric” parameters to an asset manager is a “misapplication” of regulation.

iii. Bank Access To Central Bank Liquidity and Government Insured Deposits

1261. *Id.* at 5-6; see also BlackRock Letter to FSOC, supra note 1118, at 5 (describing critical differences between a bank and an asset manager).
1262. BlackRock Letter to FSOC, supra note 1118, at 5.
1263. BlackRock Letter to FSOC, supra note 1118, at 5.
1264. BlackRock Letter to FSOC, supra note 1118, at 3.
1266. Lopez, supra note 1139, at 125.
1269. Moreolo, supra note 1215.
1270. Lopez, supra note 1139, at 126.
1271. DTCC Whitepaper, supra note 913, at 12.
Another argument in favor of asset managers – even ETF mega issuers – not being subject to bank regulation is that they can’t access “central bank liquidity” or obtain customer deposits that are government insured. 1273 Both elements have been historically present when applying prudential controls. 1274 BlackRock argued, in its submission to FSOC that “the absence of reliance on government guarantees or support” was a “critical difference” between themselves and a bank. 1275 As a result, a lack of access to central bank liquidity distinguishes them from commercial and investment banks and government sponsored entities. 1276 Further, unlike a deposit at a bank, ETF investors don’t have a “guarantee” on their investment principal. 1277 This line of argument is somewhat weakened if the analogy to MMMFs hold true for fixed income ETFs used as cash substitutes by institutions. 1278 Given the Fed and Treasury’s previous bailouts of the MMMF industry, 1279 fixed income ETFs acting as “shadow” deposits could prompt government action and support in a crisis. 1280

iv. Is Bank-Style Prudential Oversight Even Effective For ETF Issuers?

It’s questionable whether enhanced prudential oversights for asset managers (like ETF issuers) using “bank regulatory principles to address systemic risk” will be efficient or effective. 1281 ETFs issuers have not been traditionally subject to prudential controls. 1282 Also, one could question if the Federal Reserve is best suited to regulate an ETF issuer, or whether the task should be fulfilled by securities regulators (with greater expertise). 1283 Capital controls may also have reduced “utility” for asset managers since ETF risks largely emanate from the interconnective impact of their product (ETFs), rather than their own risk taking behaviors. 1284 Also, the use of leverage by ETF issuers is generally at the “fund level” rather than firm operations. 1285 Critics argue that enhanced controls won’t decrease systemic risk but will rather increase the cost of funds. 1286 BlackRock

1274. BlackRock FSB Letter, supra note 1258, at 3
1275. BlackRock Letter to FSOC, supra note 1118, at 5.
1276. BlackRock Letter to FSOC, supra note 1118, at 32.
1277. BlackRock Letter to FSOC, supra note 1118, at 64.
1278. ESRB Report, supra note 988, at 28.
1280. See Pozsar, Adrian, Ashcraft & Boesky supra note 1076, at 61-64 (discussing the “shadow” banking system and the government’s intervention in this market during the GFC).
1281. Wan, supra note 1267.
1282. Schwarecz & Zaring, supra note 904, at 1852.
1283. BlackRock Letter to FSOC, supra note 1118, at 5.
1284. See Wan, supra note 1267, at 830.
1285. Wan, supra note 1267, at 831.
1286. Wan, supra note 1267, at 827.
also argues that unlike other segments of the “shadow banking” world, its securities lending operations isn’t characterized by significant leverage. Further post-GFC reform in the DFA mandates stress-tests on asset managers who cross certain asset thresholds, so there is already a measure of prudential oversight for this sector.

d. Identifying Potential Value in ETF Mega Sponsor Concentration

There are also several reasons to suggest that market concentration in asset management benefits consumers. First, because of “economies of scale,” large ETF issuers can pass on operational efficiencies to investors (particularly institutional) in the form of lower costs. Second, ETFs can act as “vehicles of price discovery” for underlying assets, particularly for illiquid underlying like fixed income and high yield bond ETFs. Others suggest that ETFs perform a “stabilizing”, or economic shock absorbing function in a crisis, or during periods of extreme volatility, by “providing direct exposure to a physical basket of stocks in place of levered derivatives” and evidence of this phenomenon occurred in the Greek financial crisis of 2015. BlackRock in its May 2019 submission to FSOC on the revised activities based framework for non-bank SIFIs has argued as much, citing how in both 2015 and 2018, ETFs for “high yield” bonds acted as a “shock absorber” during bouts of heightened volatility.

e. The Limits of Activities-Based Regulation For Interconnected ETF Firms

There are concerns that FSOC’s activities-based framework could decrease financial system stability. Given the revised guidance, it seems unlikely that an asset manager will be legally labeled a non-bank SIFI. Former Treasury

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1287. Novick, supra note 1260, at 3-4.
1288. Lopez, supra note 1139, at 126.
1289. Bebchuck & Hirst, supra note 864, at 729.
1290. Novick, supra note 1260, at 15.
1292. Seyffart & Balchunas, supra note 979.
1293. BlackRock Letter to FSOC, supra note 1118, at 27.
Secretaries Timothy Geithner and Jacob Lew, along with former Federal Reserve Chairs Ben Bernanke and Janet Yellen have stated, in written comments to FSOC, that the proposed changes effectively “neuter the designation authority.” Numerous commentators and academics view “activity” and “entity” oversight as “complementary” rather than “substitutive.” Others suggest a “tailored” approach to regulating systemically important non-banks. This section will outline how an activities framework may not effectively mitigate the interconnection-based risks in ETFs.

i. The Challenge of Anticipating Risky Activities or Estimating Financial Distress

The FSOC’s revised guidance requires a quantified assessment of the “likelihood” of a firm experiencing financial distress. Interconnection risks are very hard to quantify, and the final subsection will highlight regulatory measures that could create more transparency and effective monitoring for ETFs. Better Markets, in its FSOC submission, notes that for highly connected and complex firms, with opaque and global operations and fee generating activities, predicting financial distress is extremely challenging (and it didn’t happen prior to the GFC). The failure of regulators to anticipate the systemic risk of CDS and mortgage-backed securities (MBS) used by complex and interconnected firms, makes one skeptical that regulators will be able to successfully predict the activities underlying the next major crisis. Professors Kress, McCoy and Schwarcz have persuasively argued that it is easier to identify “ex ante” large and highly interconnected firms than systemically risky activities. They also note (citing economist Frank H. Knight’s “unknowables” concept) that systemic risk predictions require “quantitative

1296. Geithner et al., supra note 906.
1299. FSOC Proposed Rules, supra note 1230, at 9035.
1300. See infra Section V(vi).
1303. Id.; Kress, McCoy & Schwarcz, supra note 874, at 1463.
projections” which are impossible.\textsuperscript{1304}

Geithner, Bernanke, Yellen and Lew in their FSOC submission suggest that the risk profile of a non-bank can (and did in the lead up to the GFC) “change rapidly” and also the “path” of a crisis is dependent on economic factors that are impossible to predict.\textsuperscript{1305} As noted by Professors Kress, McCoy and Schwarcz, the number of rapidly changing “potential explanatory variables” and the interplay of “behavioral elements” in the context of a crisis make a “statistical inference” of firm distress and systemic risk transmission unknowable.\textsuperscript{1306} This is why the FSOC designation power was designed in the first place – to give a “pre-emptive” tool that can only work \textit{ex ante} (Geithner \textit{et al.} liken the failure of a large interconnected non-bank to a nuclear power plant where safety guidelines can be imposed in the midst of a “meltdown.”)\textsuperscript{1307}

\textit{ii. The Speed of Interconnection Generated Contagion and Distress Transmission}

The activities-based framework requires CBA prior to making an entity designation.\textsuperscript{1308} \textit{Better Markets} in its submission to FSOC states that this requirement makes a designation “almost impossible as a practical matter.”\textsuperscript{1309} If a non-bank (like an ETF issuer) became systemically important during a crisis, the “burdensome,” time consuming, and “imprecise” administrative process in making a declaration could render the enhanced measures ineffective.\textsuperscript{1310} Interconnectedness can serve as a “conduit for contagion.”\textsuperscript{1311} Relatedly, there are “serious analytical challenges” in even attempting such a calculus, as prudential regulatory measures are difficult to accurately assess, and may create litigation risk.\textsuperscript{1312} Further, the use of CBA in financial regulation has been highly criticized by scholars such as Professor John Coates who describe it as “unfeasible” particularly for unquantifiable costs like potential systemic risks.\textsuperscript{1313} Professor Jeffrey Gordon has also described CBA as “empty” since finance is “based on a series of trade offs of values that are normatively derived”

\textsuperscript{1304} See Kress, McCoy & Schwarcz, \textit{supra} note 874, at 1483; \textsc{Frank K. Knight, Risk, Uncertainty and Profit} \textit{6}, 214–15, 224–25 (Dover Publ’ns Inc. 2006) (1921).
\textsuperscript{1305} Geithner \textit{et al.} \textit{supra} note 906.
\textsuperscript{1306} Kress, McCoy & Schwarcz, \textit{supra} note 874, at 1483.
\textsuperscript{1307} Geithner \textit{et al.} \textit{supra} note 906.
\textsuperscript{1308} FSOC Proposed Rules, \textit{supra} note 1230, at 9034.
\textsuperscript{1309} Better Markets, \textit{supra} note 881.
\textsuperscript{1310} Better Markets, \textit{supra} note 881.
\textsuperscript{1311} DTCC Whitepaper, \textit{supra} note 913, at 4.
\textsuperscript{1312} Kress, McCoy & Schwarcz, \textit{supra} note 874, at 1486.
\textsuperscript{1313} \textsc{John C. Coates IV, Cost Benefit Analysis of Financial Regulation: Case Studies and Implications}, \textit{124 Yale L. J.} 882, 1010-11 (2015).
and based on “pragmatic” design.\textsuperscript{1314}

Geithner et al. suggest that “following the steps outlined in the guidance” the revised process could take up to six years (even more) to declare a non-bank SIFI, and the activities review alone would take “at least” two years.\textsuperscript{1315} They suggest this timeline is “unworkable” given the speed that the GFC materialized.\textsuperscript{1316} They note, “[e]ven in the months leading up to the crisis, it was not clear which financial firms were most at risk of failing nor was it clear how the risks from the failure of those firms would impact other financial institutions, financial markets, or the economy as a whole.”\textsuperscript{1317} An operational disruption or stress event at a large ETF issuer could precipitate a run on the firm, or a cascade to peer funds or underlying assets.\textsuperscript{1318} This warrants strong risk mitigation efforts at an ETF issuer firm level. Fear driven overreaction from informational uncertainty is common in a crisis, even if the ultimate damage turns out to be “rather modest.”\textsuperscript{1319} This is because market crises take place in a “complex, adaptive network” which is characterized by financial and non-financial “interconnections.”\textsuperscript{1320} This is relevant to ETFs given the numerous market participants in a complex operating ecosystem.

\textit{iii. Regulatory Coordination Costs and International Challenges}

The risks stemming from ETFs transcend singular parties, and are largely driven by interconnective complexity, individual incentives, collective actions, and the potential for non-linear responses.\textsuperscript{1321} Thus, regulatory measures need to consider all impacted market segments. The activities-based framework relies on a firm’s primary regulator to mitigate systemically risk activities,\textsuperscript{1322} and in

\begin{itemize}
\item 1315. Geithner et al. \textit{supra} note 906.
\item 1316. Geithner et al. \textit{supra} note 906.
\item 1317. Geithner et al. \textit{supra} note 906.
\item 1318. \textit{See infra} Section IV(i)(d).
\item 1319. Bank of England Chief Economist Andrew Haldane has noted this phenomenon in both financial markets and in medical crises, comparing the over-reaction from the outbreak of \textit{Severe Acute Respiratory Syndrome (SARS)} to the way banks and financial market participants reacted when Lehman Brothers failed, in both cases the actual damage was “relatively modest” despite significant economic costs from the initial reaction. \textit{See} Haldane, \textit{supra} note 901 at 1 (“These similarities are striking. An external event strikes. Fear grips the system which, in consequence, seizes. The resulting collateral damage is wide and deep. Yet the triggering event is, with hindsight, found to have been rather modest. The flap of a butterfly’s wing in New York or Guangdong generates a hurricane for the world economy. The dynamics appear chaotic, mathematically and metaphorically.”)
\item 1320. Haldane, \textit{supra} note 901, at 1.
\item 1321. \textit{See infra} Section IV.
\item 1322. Kress, \textit{supra} note 1236.
\end{itemize}
the case of an ETF issuer, this would be the SEC.\textsuperscript{1323} Under the revised guidance the FSOC will use “informal measures” to influence other regulators; however, these measures are non-binding,\textsuperscript{1324} and the process of seeking harmony creates logistical complexity, coordination costs and litigation risks.\textsuperscript{1325} The FSOC’s powers, under an activities-based framework, have thus been criticized as akin to those of “a glorified think tank.”\textsuperscript{1326} Some academics suggest that an activities-based systemic risk regulator can only be effective if deployed through a consolidated federal regulator, and the current level of “jurisdictional fragmentation” in the U.S. “undermine[s]” the ability to successfully implement this approach.\textsuperscript{1327} Also, given the global nature of mega ETF firm operations, an effective activity-based regulatory framework would require coordinated international regulatory harmony, and this could be nearly impossible to obtain.

\textit{iv. Cumulative Impact of Interconnectedness Transcends Singular Activity}

As noted by Geithner et al., in the GFC there was “no one activity that propagated risk through the system.”\textsuperscript{1328} Further, Professors Kress, McCoy and Schwarz posit that the “systemic riskiness” of a firm is “cumulative,” and “inherently a product of the interrelations among its various activities and risk-management activities.”\textsuperscript{1329} They point to examples from the GFC including the relationship between AIG’s derivatives and securities lending practices, and the “interactions” of activities undertaken by \textit{Lehman} and \textit{Bear Stearns}, from repo agreements and commercial paper to MBS.\textsuperscript{1330} The “known and unknown activities” that facilitate instability during a crisis like contagion sell-offs, runs on non-bank firms; and the impact of “systemic interconnections” makes an activities-based framework inadequate to prevent systemic risk transmission from non-bank financial companies.\textsuperscript{1331}

An activities-based framework is unlikely to address the “combination of activities” undertaken by one entity.\textsuperscript{1332} An entity-based declaration, that uses

\begin{itemize}
\item \textsuperscript{1323} See Wan, \textit{supra} note 1267, at 810 (noting the Commission’s role as a primary regulator in the ETF context).
\item \textsuperscript{1324} See 12 U.S.C. § 5330(c)(2) (noting such a distinction).
\item \textsuperscript{1325} Geithner et al. \textit{supra} note 906.
\item \textsuperscript{1326} Kress, McCoy & Schwarz, \textit{supra} note 874, at 1463.
\item \textsuperscript{1327} Kress, McCoy & Schwarz, \textit{supra} note 874, at 1505-1506.
\item \textsuperscript{1328} Geithner et al. \textit{supra} note 906.
\item \textsuperscript{1329} See Kress, McCoy & Schwarz, \textit{supra} note 874, at 1462 (noting the inherent blind spots present in an activities-based approach).
\item \textsuperscript{1330} Kress, McCoy & Schwarz, \textit{supra} note 874, at 1462.
\item \textsuperscript{1331} See Kress, McCoy & Schwarz, \textit{supra} note 874, at 1489-1492 (further discussing the limitations of an activities-based framework).
\item \textsuperscript{1332} Geithner et al. \textit{supra} note 906.
\end{itemize}
prudential measures, can at least limit the “cumulative impact” of large, interconnected firms in a crisis, and give the regulator extensive insight into the risk profile of the entity and its interconnected parts.\textsuperscript{1333} The failure of a large ETF firm could have significant consequences for the economy, yet under the revised FSOC guidelines by the time a non-bank SIFI experiences material distress it could be “too late.”\textsuperscript{1334} Additionally (and perhaps most importantly) as noted by the DTCC, one of the most effective ways to “address interconnectedness risks” is to increase the “resilience of the most interconnected”\textsuperscript{1335} and the growth of the mega ETF firms (combined with the complex interconnectedness factors cited above)\textsuperscript{1336} makes a strong argument for heightened oversight. As noted by Andrew Haldane, “[i]t is only when the hub – a large or connected financial institution – is subject to stress that network dynamics will be properly unearthed.”\textsuperscript{1337}

f. Continuing ETF Risk Monitoring & Alternative Regulatory Considerations

The FSOC declaratory power for non-bank SIFIs is not a perfect administrative tool, and it may have several deficiencies from the perspective of administrative law.\textsuperscript{1338} It does, however, serve as a safeguard for systemic risks of highly interconnected non-banks. Given the speed at which a crisis (like the GFC) can crystalize, measures that can help both detect, and mitigate, interconnected shock transmission is only “effective” if instituted in advance of a panic.\textsuperscript{1339} This final subsection will assess other alternative regulatory considerations or measures, and the most important areas for future assessment in ETFs. It highlights the challenges that lay ahead, as systemic risk transmission from ETFs is most likely to come from collective actions, and non-linear responses, which are very difficult to test or prevent.

\textsuperscript{1333} Kress, McCoy & Schwarz, supra note 874, at 1463.
\textsuperscript{1334} See Gregg Gelzinis, Don’t Put SIFI Designations on the Bank Burner, AMERICAN BANKER (Jan. 29, 2018), https://www.americanbanker.com/opinion/dont-put-sifi-designations-on-the-back-burner [https://perma.cc/VXP5-AK4E] (emphasizing the need for the FSOC’s promptness when assessing potential SIFIs).
\textsuperscript{1335} DTCC Whitepaper, supra note 913 at 2.
\textsuperscript{1336} Supra, Section IV (d).
\textsuperscript{1337} Haldane, supra note 901, at 6 (noting that this “small world property” has also been shown to exist in physical networks such as the internet and forest fires).
\textsuperscript{1339} Id.
i. Understanding and Monitoring AP Discretionary Incentives

As noted above, the ETF ecosystem is continually reliant on the voluntary participation of intermediaries (APs) who act, not under legal obligation, but rather with discretionary market-based incentives, and their departure from this ecosystem could trigger numerous externalities. Given the importance of AP arbitrage to the integrity of ETFs, regulatory measures that provide greater transparency around this function, such as those recently proposed by Professors Hu and Morley, are worthwhile to consider. Further, it is worthwhile to study AP’s behavioral and market incentives to better understand the specific scenarios which would influence their departure from performing arbitrage. Relatedly, it is important to study the incentives of other market makers, including high frequency traders, to understand when they will depart from providing liquidity support.

ii. Schwarcz & Zaring’s “Regulation by Threat” Applied to ETF Firms

Despite the challenges identified above in designating an asset manager a non-bank SIFI, Professors Schwarcz and Zaring posit that FSOC’s “threat” of levying such a designation could both the curb risk taking behaviors of the non-banks and hold their primary regulators to a higher standard of accountability. Despite being seen by some as undermining the “notice-and-comment” process, the authors suggest threat based regulation is particularly useful when “risks are hard to identify” and “perils of mistake are great.” The ability for a regulator to “buy an option” has been previously noted by Professor Sunstein as useful when regulators are operating with informational opacity.

1340. Supra, Section (V)(a)(ii).
1341. The importance of discretionary actors to the continued stability of the ETF ecosystem has been noted by several researchers, see Clements, supra note 1158; Hu & Morley, A Regulatory Framework, supra note 1026; Hu & Morley, The SEC and Regulation of Exchange-Traded Funds, supra note 1026; CBI Discussion Paper, supra note 1020; Ramaswamy, supra note 1158 (all noting the significance of such discretionary actors).
1342. See Hu and Morley, A Regulatory Framework, supra note 1026, at 849; see also Hu & Morley, The SEC and Regulation of Exchange-Traded Funds, supra note 1026, at 1159-61 (advocating for a single regulatory framework for ETFs, organized around the “arbitrage mechanism” that requires enhanced “qualitative” and “quantitative” assessments for this crucial function. The authors suggest disclosures analogous to a “management discussion & analysis” (MD&A) for a specific fund’s “arbitrage mechanism”).
1343. See Hu & Morley, The SEC and Regulation of Exchange-Traded Funds, supra note 1026, at 1194-5 (discussing such scenarios and their overall effect on successful arbitrage).
1345. See Schwarcz & Zaring, supra note 904, at 1817.
1346. Schwarcz & Zaring, supra note 904, at 1819.
1347. Schwarcz & Zaring, supra note 904, at 1819.
1348. See Cass. R. Sunstein, Irreversible and Catastrophic, 91 CORNELL L. REV. 841, 845-46
The risks emanating from operation of an ETF are complex, and largely derived from unknowns about how collective actors will pursue discretionary incentives or act with behavioral biases like forming herds.\(^\text{1349}\) Perhaps, for these reasons, this should give us pause to depart from the FSOC entity-based declaratory powers.

### iii. What Are The Key Systemic Risks In ETFs To Monitor Going Forward?

There are several key areas to monitor in ETFs going forward. First, numerous “structural vulnerabilities associated with asset management activities,” identified in 2017 by the FSB, are still relevant - including liquidity mismatch between ETFs and underlying securities, the use of leverage and derivatives in funds, securities lending activities, and the possibility of firm level operational disruption.\(^\text{1350}\) Relatedly, factors identified by the European Systemic Risk Board (ESRB), like the impact of ETFs on the co-movement of indices and underlying securities,\(^\text{1351}\) the volatility\(^\text{1352}\) and co-movement of underlying asset prices between themselves\(^\text{1353}\) (leading to “simultaneous” investor loss), the various scenarios giving rise to an ETF arbitrage breakdown where APs or other market makers step away from performing this function, and the extent (and contributing factors) that ETFs create investor “correlated exposures” and contagion.\(^\text{1354}\) Interestingly, AP withdraw and ETF investor panic respectively mirrors the “hide” or “flight” phenomenon in epidemiology in relation to behavioral responses to disease.\(^\text{1355}\)

The ESRB also identifies the potential for counterparty risk through synthetic ETFs and securities lending, and the “materialisation of operational risk” for key ETF ecosystem participants such as ETF sponsors, APs and market makers given industry concentration.\(^\text{1356}\) There are also strong reasons, such as institutional adoption as cash and MMMF substitutes, and industry moral hazard and originate to distribute, to consider fixed income and loan ETFs a key

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\(^{1349}\) Infra Section IV(ii)(b).

\(^{1350}\) FSB Structural Vulnerabilities, \textit{supra} note 936, at 9-10.

\(^{1351}\) \textit{See} ESRB Report, \textit{supra} note 988, at 19-22 (presenting such factors depicting this impact).

\(^{1352}\) \textit{See} Ben-David et al., \textit{supra} note 1206.


\(^{1354}\) ESRB Report, \textit{supra} note 988, at 2-3.

\(^{1355}\) Haldane, \textit{supra} note 901, at 7.

\(^{1356}\) ESRB Report, \textit{supra} note 988, at 2-3, 32.
segment of the industry to monitor going forward.\textsuperscript{1357} This is a market that has experienced significant U.S. and international post-GFC growth.\textsuperscript{1358} Risky sub-classes of the fixed income ETF market, like emerging market debt, and high yield, are also growing.\textsuperscript{1359}

\textit{iv. Can There Be Too Much Asset Manager Proxy Voting Control?}

ETF capital flows are contributing to a passive-investment generated proxy voting bottleneck, with power materially concentrating in the hands of very few firms.\textsuperscript{1360} The ominous near-reality of intermediated capital markets overseers – essentially “ruling on capital’s behalf” - is the path ETFs investors find themselves on.\textsuperscript{1361} It’s possible that ETF mega issuers have the capacity, and expertise, to make better governance judgments than ordinary investors. Yet, recent reports suggest “hidden dangers” in their power, like deleterious effects on competition, corporate investment, innovation and consumer welfare.\textsuperscript{1362} Also, indexing creates a gatekeeping function making asset managers stewards of the economy as a whole.\textsuperscript{1363} Professor John Coates calls this the “greatest concentration of economic control in our lifetimes.”\textsuperscript{1364} BlackRock has signaled intentions to use their influence to enact climate change initiatives.\textsuperscript{1365} Asset manager proxy voting control has systemic implications, and will require policy

\textsuperscript{1357} See SEC Subcommittee Report, \textit{supra} note 977, (discussing such rationale).
\textsuperscript{1358} See SEC Subcommittee Report, \textit{supra} note 977, at 6 (“Assets in fixed income open-end mutual funds and ETFs have seen rapid growth in recent years. Overall, fixed income mutual funds and ETFs account for 11% of the U.S. bond market (US government bonds, corporate bonds, and tax-exempt bonds) as of December 2018, up from 7% a decade earlier.”)
\textsuperscript{1359} See SEC Subcommittee Report, \textit{supra} note 977 (“Fixed income ETFs have experienced growth in a variety of sub-asset classes of the bond market in recent years. Initially, these were typically portfolios of investment grade and government bonds, but have been extended to other categories including high-yield bonds, emerging market bonds, and even bank loans.”).
\textsuperscript{1360} ETFs, and other index investments, are polarizing, and some market participants have even gone as far as to associate them with a form of “Marxist economy” or central planning, see Teresa Rivas, ‘Passive Investing Is Worse Than Marxism’: Bernstein, \textsc{Barron’s} (Aug. 23, 2016), https://www.barrons.com/articles/advisors-cash-is-king-amid-uncertainty-51546881439 [https://perma.cc/NH3F-ZK77].\textsuperscript{1361} See Christophers, \textit{supra} note 1051.
\textsuperscript{1363} See id. (noting that “[f]und companies have multiple tools to influence corporate behavior, such as developing preferred policies on executive compensation, carbon footprints, gender diversity, and other governance matters. They often do this in coordination with other industry leaders . . . .”).
\textsuperscript{1364} See Coates, \textit{supra} note 1052.
attention.\textsuperscript{1366} It also forces regulators, and systemic risk monitors, to ask whether certain firms could ever have too much voting power? Even if it’s market forces that are generating it.

\textit{v. Mitigating Non-Linear Financial Market Interactive Effects, Herds and Crowd Behavior}

Individual ETFs don’t evoke the most concern in this market (although certain ETFs like inverse, leveraged and “non-transparent” varieties are problematic). Rather, instability comes from collective actions, interconnection, discretionary behaviors, non-linear impacts, crowd behaviors (like information cascades, runs and fire sales). One of (many) challenges in this area is that some interconnectedness is desirable (since “financial networks tend to be robust yet fragile”), yet the “optimal” level of interconnectedness is difficult to ascertain, and precise policy measures challenging to create.\textsuperscript{1367} As a result, regulation should at least enhance the “resilience” of financial firms that are most centrally interconnected.\textsuperscript{1368} Unfortunately, the U.S. doesn’t have an effective regulatory framework to deal with the complexities, and interconnections, inherent in the modern financial “ecosystem.”\textsuperscript{1369}

Some have recently called for more U.S. asset managers to get “stress tested” like banks, and regulators in Europe appear to be ahead of the curve of the Americans at this point.\textsuperscript{1370} Stress tests would need to stretch across individual firms and capture collective actions in the ETF ecosystem to be truly effective. As such, ETFs are an area where the use of technology (or “regtech”) for enhanced supervision may have important utility in the future.\textsuperscript{1371} However, on the use of technology Professor Erik Gerding cautions that systemic and other forms of complexity in financial markets may be better confronted by

\begin{itemize}
\item \textsuperscript{1366} See Coates, \textit{supra} note 1052, at 20-23 (providing a broad discussion of the policy options that are possible in response to the concentration of corporate shareholders because of the growth of index funds including self-regulatory codes or regulations regarding stewardship, voting dilution, ownership “caps” or other “structural limits” imposed on ETF firms.)
\item \textsuperscript{1367} DTCC Whitepaper, \textit{supra} note 913, at 10.
\item \textsuperscript{1368} DTCC Whitepaper, \textit{supra} note 913, at 11.
\item \textsuperscript{1369} Dan Awrey & Kathryn Judge, Why Financial Regulation Keeps Falling Short, \textit{CORNELL LAW SCHOOL LEGAL STUDIES RESEARCH PAPER} NO. 20-03; \textit{EUROPEAN CORPORATE GOVERNANCE INSTITUTE (ECGI) LAW WORKING PAPER} NO. 494/202; \textit{COLUMBIA LAW \& ECONOMICS WORKING PAPER} NO. 617 (2020) available at: https://scholarship.law.columbia.edu/faculty_scholarship/2604 [https://perma.cc/G9AB-U532].
\end{itemize}
adjustments to “old-fashioned disclosure” rather than “hi-tech disclosure solutions.”

A potentially more useful technological framework to envision is Andy Haldane’s dream of a “Star Trek chair and a bank of monitors” that tracks the global flow of ETFs in “close to real time” similar to weather systems and internet traffic. Access to data, and global regulatory coordination costs stand as obvious frictions to this vision. Professor Gerding adds further caution that regulators need to be careful about delegating or outsourcing risk modeling to private industry (a phenomenon that was widespread in the lead up to the GFC).

**vi. The New Challenge of Non-Transparent ETFs**

As noted, the SEC recently approved four applications for “non-transparent” ETFs. This is a significant development and one worthy of continued investigation. The SEC will require approved non-transparent ETFs to only invest in securities that trade on exchanges, and also to provide APs with a daily “‘proxy’ portfolio” (identifying assets but not portfolio weights). It’s believed that APs can perform the arbitrage function through the proxy portfolio, and those in support of this development suggest that it will promote more active management, which will improve market efficiency. Further, advocates say that concealing fund compositions allows for more competition in the market and mitigates the poaching of novel index strategies. Yet there are numerous uncertainties about how these structures will affect market stability. True arbitrage is risk-free, or guaranteed. If an AP doesn’t know an index’s exact composition it can’t ensure true arbitrage. If transparent plain-vanilla ETF structures risk arbitrage breakdown, surely non-transparent structures are even more precarious.

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vii. The Opaque Corner of Index Provider Regulation

Another area of ETF systemic risk consideration worthy of ongoing investigation is the regulation of index providers. SEC Commissioner Robert J. Jackson Jr. and Professor Steven Davidoff Solomon have identified that indexes may not be as transparent as otherwise believed and are vulnerable to bias and manipulation. Index creation is subject to very little regulatory oversight. Index providers face conflicts of interest; for example it’s been reported that MSCI (the world’s largest index provider) was pressured (and threatened) by the Chinese government to include more Chinese companies in their indices to facilitate foreign investment capital flows into China. Professor Adriana Robertson recently documented how the “overwhelming majority” of indexes in a surveyed sample were used as a benchmark for a single fund, and a “substantial fraction” of ETFs track indices created by the ETF issuer or an affiliate.

vii. Conclusion: What Are The Costs of Liquidity Transformation?

It’s easy to wonder whether the true costs of ETF liquidity transformation are under-estimated. ETFs that hold bonds and bespoke loans create instant liquidity for retail investors to markets that are opaque and otherwise difficult to access. History lends caution when illiquid underlying assets are synthesized into instantly liquid financial products. The idea of transforming something that’s fundamentally “illiquid” (like a loan) into something “liquid” (an ETF that represents a loan basket) evokes a liquidity “mismatch” and “illusion” concern (reminiscent of MBS in the GFC). Deposit insurance, and central banks acting as “lenders of last resort,” curb bank run and systemic risks. This

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1382. See Jackson & Solomon, supra note 1086.
1383. See DeCambre, supra note 1088.
1384. See Bird, supra note 1087.
1386. See Chris Flood, ‘Big Ticket’ Trades Made Possible By Bond ETF Liquidity, FINANCIAL TIMES (June 17, 2018), https://www.ft.com/content/b5e0bb88-5865-11e8-806a-808d194ff875
“extraordinary” government support has not been “normally” available to other firms, and represents a social “cost” of the intermediation, liquidity and maturity transformation services that a bank provides.

The MMMF crisis showed, however, that the government was willing to support “shadow deposits” in the GFC. As a result, the MMMF market now benefits from an “implicit” guarantee of emergency government support. Like MMMFs, ETFs also offer liquidity transformation by turning less liquid (often bespoke) loans into cash substitutes. In an unprecedented move to mitigate the economic fallout from the coronavirus, on March 23, 2020 the Federal Reserve established the Secondary Market Corporate Credit Facility with authorization to purchase investment grade corporate ETFs. Now that the government is supporting the ETF market, perhaps firms providing such liquidity transformation services should have heightened safeguards.

While ETFs have many benefits, and strong demand factors, their popularity has also spawned complex interconnected ETF mega firms, with growing influence over the decisions of nearly every publicly traded corporation in America. In many ways ETFs are a “tragedy of the commons” problem where what’s good for the individual is sub-optimal for the group. Empirically there’s a “real prospect” that these ETF firms will one day have voting control over all large publicly traded companies in America. These mega ETF sponsors are growing to an unprecedented size, while fostering

1390. Morgan Ricks, Regulating Money Creation After The Crisis, 1 HARV. BUS. REV. 75, 78 (2011).
1391. See id. at 119-120.
1392. See Pozsar, Adrian, Ashcraft & Boesky supra note 1076, at 61-64 (discussing the “shadow” banking system and the government’s intervention to support it during the GFC); Blinder, supra note 909, at 147-48; Logan, Nelson & Parkinson, supra note 1075, at 9-11.
1394. See supra Section IV(d)(v).
1397. See supra Section IV(c).
1398. See supra Section IV(d)(ii).
1400. See Bebchuk & Hirst, supra note 864, at 737-741.
1401. See Dawn Lim, BlackRock’s Assets Blow Past $7 Trillion in Milestone For Investment Giant, THE WALL STREET JOURNAL (Jan. 15, 2020), https://www.wsj.com/articles/blackrocks-
The popularity of ETFs gives rise to systemic risks not otherwise present in other managed asset classes like those associated with the arbitrage function, and derived from directional and noise traders attracted to the liquidity of ETFs; yet it has also reinforced common concerns like securities lending. Post-GFC reforms have not curbed the growth and concentration of the largest asset managers, just as they haven’t prevented a few mega-banks from becoming the most important players in nearly all of the world derivatives clearinghouses. These same mega banks also happen to be some of the largest APs in the ETF ecosystem.

Interconnectivity in financial markets can both absorb and amplify shocks, making them at once “robust” and “fragile.” It’s increasingly prudent to consider financial markets together as a “system” and design regulatory structures in this light. Systemic risk in this sector is most likely to be a by-product of the collective actions of a myriad of interconnected counterparts, and manifest through phenomena such as discretionary withdrawals of key market-incentivized intermediaries, crowd behaviors from correlated exposures giving rise to information cascades, runs, fire sales, and non-linear impacts. The FSOC’s activity, and entity-based, frameworks, when evaluated individually for ETFs have limitations. As advocated by previous scholars, it would be prudent to not consider these approaches as mutually exclusive but look at them as complimentary, and this is particularly true for the ETF mega-players. These giant asset managers may be growing “too connected to fail” and the most effective regulatory framework will require a cross-market “system-wide” toolkit to monitor and assess the collective behavior of all participants.

ETFs as a financial market case study highlight externalities associated with complex systems including what Andrew Haldane identifies as tensions in robustness and fragility onset through complexity and “homogeneity,”
“feedback effects” in periods of heightened stress, unknown risks (the so called “Knightian uncertainties”), and network “dimensionality” due to financial innovation. \(^1\) Haldane suggests that, given these dynamics, policy prescriptions should increasingly include access to data to map the global financial network, improved communication across the network, regulations to “vaccinate the ‘super-spreaders’ to avert financial contagion,” and the implementation of safeguards against the “network’s dimensionality and complexity.”\(^2\) As a result, there is merit in ensuring that the most centrally connected entity in this ETF ecosystem - the issuer itself – is economically resilient and has adequate safeguards and controls in place, while also assessing activities across the network, and the behavior of its numerous interconnected participants.\(^3\)

\(^1\) Haldane, supra note 901, at 2.
\(^2\) Haldane, supra note 901, at 2.
\(^3\) See Gilbert, supra note 877.
Chapter V: Exchange Traded Confusion: How Industry Practices Undermine Product Comparisons in Exchange Traded Funds


I. Abstract

Despite their incredible popularity and importance to modern capital markets, exchange traded funds (ETFs) are extremely difficult to compare side-by-side. Investors who successfully navigate the initial challenges of product choice overload, and opaque index construction methodology, soon encounter a wide array of discretionary operational, management, marketing, and financial practices of ETF sponsors that combine to undermine simple product and performance comparisons. This dilemma is compounded by disclosure effectiveness challenges given investor cognitive limitations and behavioral tendencies. This article is the first scholarly work, amongst a growing body of ETF studies, to illustrate why accurate “apples to apples” product comparisons in ETFs are so challenging (at times even impossible) to perform. It presents a variety of ETF case studies to demonstrate this challenge including recent performance instabilities in the coronavirus pandemic.

It advocates for continued positive momentum around investor-focused reforms in ETFs, building on encouraging steps undertaken by the U.S. Securities & Exchange Commission in its recent “Rule 6c-11” under the Investment Company Act of 1940. It makes several recommendations to improve ETF product comparisons including standardizing website formats and layouts for information presentation, uniform calculation methodologies of key ETF variables, an ETF naming convention, and standard terms in sustainable investing. ETF investors would also greatly benefit from a systematized and structured electronic reporting mechanism whereby standardized data is provided by ETF sponsors to a centrally controlled public repository. Additional studies are warranted on strategic ETF disclosure ordering, digital enhancement, and added contextual discussion around critical concepts like arbitrage and index composition methodology. The ETF “model portfolio” industry is also an emerging concern that should be assessed, and the article provides suggestions to reduce informational opacity and improve comparative assessments.
II. Introduction

Over the past decade exchange traded funds (ETFs) have surged in both popularity and variety - fueled by an array of diverse and compelling demand factors. Yet despite their popularity, it is extremely difficult to effectively compare products side by side. Navigating the “sheer breadth of products all tracking the same index” can be confusing, if not completely overwhelming. One recent report noted twenty four separate ETFs that track the S&P Net Total Return Index ($US). ETFs can also be difficult to distinguish from mutual funds, or other passive investments tracking similar


1415 Recent estimates from consulting firm ETFGI Global, reports that from 2008 to 2019 the number of ETFs globally grew from 1617 to 6940, while the value of assets held in ETF products, during the same period also grew from $716 billion to over $6 trillion. See ETGFI, ETFGI report assets in the global ETFs and ETPs industry which will turn 30 years old in March started the new decade with a record 6.35 trillion US dollars (January 16, 2020), https://etfgi.com/news/press-releases/2020/01/etfgi-reports-assets-global-etfs-and-etps-industry-which-will-turn-30.

1416 The demand factors underlying the growth of ETFs are diverse and include: passive investment outperformance over active management styles (and investors becoming disillusioned with active managers in light of their failure to predict and guard against the 2008 financial crisis); the ability to obtain low-cost diversification; intra-day liquidity on secondary markets (positively distinguishing ETFs from index mutual funds); potential tax advantages over mutual funds; the ability to obtain exposure to opaque and otherwise difficult to access asset classes (like over-the-counter bonds and leveraged loans); the emergence of novel indexing structures by competing ETF sponsor firms; the growth of securities lending within the ETF industry; short-duration credit ETFs being used as institutional cash substitutes; and certain economies of scale of large ETF issuers. See Ryan Clements, Are ETFs Making Some Asset Managers Too Interconnected To Fail? 22(4) U. PA. J. OF BUS. L. 722, 736-755 (2020), available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3516936.


indices. Add to this an opaque product menu of ETFs tracking diverse asset classes, equities, bonds, commodities, numerous commercial and bespoke indices, investment styles, sectors, regions, currencies, brands and issuers.

Yet index duplication and choice overload are only two challenges, among many, that undermine accurate “apples to apples” product comparisons in ETFs. This article is the first scholarly critique, in a growing body of ETF studies, to show why side-by-side product comparisons in ETFs are exceptionally difficult (at times even impossible) to perform. It presents a variety of discretionary operational, management, marketing, and financial practices that ETF sponsors engage in that impair investor attempts to make simple product and performance comparisons. It also shows how product comparisons are obscured by disclosure effectiveness challenges in light of investor cognitive limitations and behavioral tendencies.

The Securities and Exchange Commission (SEC) recently improved the ability of investors to compare ETFs by adopting “Rule 6c-11” under the Investment Company Act of 1940 (ICA). This rule standardized the process to launch for certain ETF structures without having to obtain a costly exemptive order. While a positive step, more can be done to improve ETF product

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1420 See ETFGI, supra note 1415.
1422 See infra Part I.
1423 See infra Part II.
1425 The Investment Company Act of 1940 (ICA), 15 U.S.C. § 80a-1 (2020), authorizes open-ended management investment companies, unit investment trusts, and closed-end structures, but does not specifically authorize exchange traded funds (which combine features of both open-end and closed end structures). As a result, prior to Rule 6c-11, ETFs desiring to operate had to obtain exemptive relief from certain provisions of the ICA. For example, among others, relief was required from Section 2(a)(32) rules in relation to the definition of “Redeemable Securities” (since ETFs are only redeemable in “creation units” by authorized participants (APs) at net asset value, and not by investors in individual units who must otherwise transact in the secondary market), and Section 22(d) rules in relation to the redemption of ETF shares at
This article advocates for further investor-focused reforms by standardizing ETF website formats and layouts, requiring uniform calculation methodologies of key ETF variables, creating a formal ETF naming convention, and standard terms for sustainable investing. Comparative frictions could also be materially reduced with systematized and structured electronic reporting by ETF sponsors of standardized data to a centrally controlled public repository. Investors also stand to materially benefit from additional studies around strategic disclosure ordering and digital enhancement, and further contextual discussion around critical concepts like ETF arbitrage and index composition methodology. Also, cash-like ETFs, and the ETF “model portfolio” industry are emerging concerns that should be assessed to ensure market stability, reduce informational opacity, standardize disclosure and improve comparisons.

The article proceeds in Part I by showing how discretionary ETF sponsor operational, financial, marketing and management practices undermine the ability of investors to perform side-by-side product comparisons – even for similarly named funds. It also discusses emerging challenges with the ETF “model portfolio” industry and with active, non-transparent, and “smart-beta” ETF structures. Part II shows how behavioral tendencies, and information processing limitations, deducted from behavioral finance and judgment decision making (JDM) literature, when assessed in conjunction with mandated investment disclosures, combine to compound the challenge of ETF comparisons. The article concludes in Part III by identifying improvements made by Rule 6c-11, and then advocating for additional investor-focused reforms that will make ETF side by side comparisons easier for investors and reduce informational opacity in ETF “model portfolios”.


1426 See infra Part III.
1427 See infra Part III(b)-(g).
1428 See infra Part III(b).
1429 See infra Part III(c)-(e).
1430 See infra Part I(c)(iii) & Part III(f)--(g).
iii. Part I, ETF Industry Practices That Create Investor Confusion

In Part I, this article illustrates why true side-by-side ETF product comparisons are extremely difficult (at times even impossible). It shows how supposedly similar ETFs can exhibit significant variations because of ETF sponsor discretion in replicating an index and attempting to minimize tracking errors; diverse financial, operational, and marketing activities of ETF sponsors; and inconsistencies in fund names and product compositions.

a. Index Replication Discretion and Tracking Errors

The first source of investor confusion relates to how an index is replicated, and the actions ETF sponsors take to minimize index tracking errors. ETFs bearing consistent names and tracking similar or related indices, can be (and often perform) very differently. This subsection highlights how an ETF may deviate from the index it seeks to track; and how its trading price may also dislocate from its underlying net asset value (NAV). It also discusses the phenomenon of custom and bespoke ETF indexes, and how this contributes to investor difficulty when comparing funds.

i. ETF Sponsor Discretion on How to Replicate an Index

ETFs normally track an “index,” which is a representative measure of the performance of a “basket” of assets.\textsuperscript{1431} Index investing thus provides “instant, liquid exposure” to worldwide markets and asset classes.\textsuperscript{1432} Many popular indices are commercially sponsored like the Dow Jones Industrial Index (representing thirty “blue chip” U.S. industrial stocks), the Russell 2000\textsuperscript{®} Index (a “capitalization-weighted index” that tracks the 2000 smallest publicly traded companies in the U.S.) and the Nasdaq-100 Index (an index that tracks the 100 “largest and most actively traded non-financial” securities on the Nasdaq Stock

ETF issuers frequently replicate popular indices, as this mitigates the risk of clients seeking out desired index structures elsewhere.

Unfortunately, there is significant “variety” in the number of indices, and how they are constructed. Consider, two distinct ETFs which supposedly track the same index, and possess the same name of “U.S. Aggregate Bond ETF” (issued respectively by BlackRock and Schwab). On March 31, 2020, these two ETFs had different holdings and portfolio maturity compositions, supporting recent contentions (discussed in detail below) that indexing is actually “active” investment management. The choice of index replication

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1433 See SEC Indices, supra note 1431.
1437 The Schwab U.S. Aggregate Bond ETF had a portfolio maturity of 2.7% less than 1 year, 26.2% between 1-3 years, 32.8% between 3-5 years, 11% between 5-7 years, 9% between 7-10 year, 18.2% greater than 10 years, see SCHWAB U.S. AGGREGATE BOND ETF (SCHZ) Fact Sheet (March 31, 2020), available at https://www.schwabfunds.com/resource/schz-fact-sheet; The BlackRock iShares Core U.S. Aggregate Bond ETF had a portfolio maturity of 2.28% less than 1 year, 23.26% between 1-3 years, 35.2% between 3-5 years, 11.49% between 5-7 years, 8.99% between 7-10 years, 18.78% greater than 10 years, see BLACKROCK iSHARES CORE U.S. AGGREGATE BOND ETF (AGG) Fact Sheet (March 31, 2020), available at https://www.ishares.com/us/literature/fact-sheet/agg-ishesares-core-u-s-aggregate-bond-etf-fund-fact-sheet-en-us.pdf.
1440 See infra Part I(a)(iv); see Adriana Z. Robertson, Passive in Name Only: Delegated Management and “Index” Investing, 36 YALE J. ON REG. 795 (2019).
method also has significant impacts on whether an ETF will produce tracking errors (a matter also discussed extensively below).1441

Further, while full physical replication of an index (investing in all its listed assets1442) is possible, it is costly and often unpractical for ETFs.1443 It’s also challenging when an index has many securities that represent only a small portion of its total capitalization.1444 If an ETF tracks an index that includes illiquid securities, full physical replication also makes it very costly for ETF authorized participants (APs)1445 to acquire underlying securities when performing arbitrage.1446 The difficulties in full replication make a “sampling method” common in ETFs.1447 Sampling has been described as a form of “active management” since ETF investors are dependent on the discretionary security selections of fund managers.1448 In addition to sampling replication, other index construction methods include synthetic,1449 and optimization1450 (which includes

1445 See DEUTSCHE BUNDESBANK, supra note 1442 at 83-84.
1446 Sloane Ortel, Paul Kovarsky & Antonella Puca, How to see the hidden risks of ETFs, CFA INSTITUTE (January 1, 2018), https://blogs.cfainstitute.org/investor/2018/01/18/how-to-see-the-hidden-risks-of-ets/; see Fisch, Hamdani, & Solomon, supra note 1414 at 21; Robertson, supra note 1440.
1447 See DEUTSCHE BUNDESBANK, supra note 1442 at 83-84.
“stratified sampling.”) These methods potentially introduce tracking error. A synthetically replicated ETF uses derivatives (with cash collateral), where the ETF sponsor enters into a swap transaction.

**ii. Premiums, Discounts, and the Impact of ETF Arbitrage Instability**

When ETFs trade in the secondary market, their prices will sometimes dislocate from their underlying NAV. For example, on August 24, 2015, the U.S.’s two largest S&P 500 tracking ETFs traded at both a discount to and a premium from, respectively, their NAVs at the exact same time. Several instances of significant premiums and discounts in ETFs have been noted in the literature over the last decade. Every ETF trades differently, and price dislocations have tremendous ramifications for investors who may unknowingly purchase an ETF above its fair market value (at a “premium”) or sell below what its worth (at a “discount”). ETF secondary market prices only align with their underlying NAV when financial intermediaries (the aforementioned APs) redeem or create new ETF shares in a process called “arbitrage.” APs have a contractual right but not a legal or fiduciary “obligation” to perform this

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2020) ("The primary idea of the optimisation is to build a new portfolio with the same characteristics as the index with less securities to reduce transaction cost and/or the exposure to illiquid assets.")

1451 See id. ("the portfolio manager divides the underlying securities of the benchmark into multiple risk buckets with similar characteristics and selects individual securities to build the new portfolio."); see Comment Letter to SEC of BlackRock on File No. S7-15-18 (September 26, 2018), at 4, available at https://www.sec.gov/comments/s7-15-18/s71518-4428129-175691.pdf (hereinafter “BlackRock Comment Letter”) ("Most bond index ETF portfolio managers employ a set of techniques to effectively sample bonds from the broader underlying index.")

1452 See Part I(i)(c).

1453 See DEUTSCHE BUNDESANK supra note 1442 at 83-84.


1455 See Hu & Morley 1, *infra* note 1459 at 846.

1456 See Bhattachaya & O’Hara, *infra* note 1460 at 3-4; Hu & Morley 1, *infra* note 1459 at 856-863.


arbitrage. In a normally functioning market, APs have a market incentive to perform this arbitrage because they can extract risk free profits. This arbitrage function is heavily automated by computer algorithms – a phenomenon recently criticized as exacerbating market volatility.

The problem is that markets are often abnormal, and ETF arbitrage malfunctions and trading price dislocations can both harm investors and obscure product comparisons. Further, ETFs that track similar indices will exhibit different dislocations in a crisis. There are numerous factors that can contribute to APs withdrawing from performing arbitrage including a lack of desire to deal in undesirable securities, “inventory risk” during periods of market stress, an inability to acquire and “transact in” certain underlying or illiquid assets, and conflicts when acting as dealers in the underlying asset market (especially for less liquid assets like bonds). Price dislocation risk is

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1460 See Ayan Bhattacharya & Maureen O’Hara, ETFs and Systemic Risks, CFA INSTITUTE RESEARCH FOUNDATION BRIEF (January 2020) at 5, available at https://www.cfainstitute.org/-/media/documents/article/rf-brief/etfs-and-systemic-risks.ashx (“For instance, if the ETF is trading at a premium, authorized participants would sell short the ETF while simultaneously buying the underlying securities. At the end of the day, authorized participants would deliver the basket of securities to the sponsor in exchange for ETF shares, thus closing out the short position for a profit.”)


1462 See Johnson, supra note 1457 (“The March 12 closing prices for Vanguard Total Bond Market Index ETF (BND), iShares Core U.S. Aggregate Bond ETF (AGG), and Schwab U.S. Aggregate Bond ETF (SCHZ) represented respective discounts to the funds' NAVs of 6.2%, 4.4%, and 6.3%."

1463 See Clements, supra note 1458 at 30-32.


a significant factor that can affect ETF investor portfolio performance.\textsuperscript{1467} Rule 6c-11 did not prescribe a minimum number of APs per ETF to perform the arbitrage function,\textsuperscript{1468} despite expressed concerns about arbitrage and market making instability in stressed markets, and potential “anticompetitive behavior” due to AP concentration.\textsuperscript{1469} Yet to compare ETFs side by side one must assess the arbitrage robustness of individual ETFs, a task which is very difficult.\textsuperscript{1470}

A critical case study in ETF price dislocation, and the fragility of AP arbitrage in a crisis, is the recent market sell-off associated with the coronavirus pandemic. Severe NAV discounts emerged in ETFs in March 2020 as the market priced in the significance of the pandemic.\textsuperscript{1471} Corporate bond ETFs in U.S. and European markets (most noticeably high-yield credit ETFs) were particularly affected, with ETF secondary market prices dropping precipitously below their NAV.\textsuperscript{1472} Some of the discounts were “historic” such as the Vanguard Total Bond Market ETF, which traded 6.2 percent below its NAV in March,\textsuperscript{1473} and the BlackRock iShares iBoxx $ Investment Grade Corporate Bond ETF which traded at a 5 percent discount to NAV.\textsuperscript{1474} Even normally “ultra-stable” short-maturity bond ETFs experienced historic single day losses, with Bloomberg

\textsuperscript{1468} Rule 6c-11, supra note 1424 at 54.
\textsuperscript{1470} See Hu & Morley 1, supra note 1459 at 892-900; Clements, supra note 1458 at 31-32.
reporting that during peak volume “roughly 70 fixed-income ETFs were trading with at least a 5% discount to their net asset value, and 16 traded at a discount of 10% or greater.” Bond ETF discounts emerged because APs and market makers stopped performing arbitrage in credit ETF during the sell-off as bonds became “difficult to unload.” Massive discounts (as high as 15 percent) also surfaced in emerging market ETFs.

These massive price dislocations persisted in credit ETFs until the Federal Reserve intervened with its Secondary Market Corporate Credit Facility (SMCCF), at which point ETF prices realigned with their underlying NAV. The SMCCF included an unprecedented act of purchasing credit ETFs. The impetus for this unheralded move by the Fed was to “restore order” between corporate credit and ETF markets, and remedy the steep price “inconsistencies” that had emerged in the latter. The Fed’s foray into ETFs was controversial since BlackRock (the world’s largest ETF sponsor) was tasked to oversee purchases, despite a clear conflict being able to purchase its own funds. In the first two months after the SMCCF, over half of the ETFs purchased by the government (mostly from large banks and investment companies) were BlackRock products, and this created a corresponding surge of $2.9 billion of new investor funds into BlackRock’s flagship investment grade

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1481 See Greifeld & Kawa, supra note 1476.
1482 See Richard Henderson & Robin Wigglesworth, Fed’s big boost for BlackRock raises eyebrows on Wall Street, FINANCIAL TIMES (March 27, 2020), https://www.ft.com/content/08b897a5-aadb-40d7-922c-431154ed968a.
credit ETF. Also, with BlackRock at the helm, the Fed purchased hundreds of millions of dollars of BlackRock high-yield (junk-bond) ETFs.

In a recent publication, I identified the similarities between ETFs and instabilities in Auction Rate Securities (ARS) market in 2008, and portfolio insurance in 1987. The coronavirus pandemic strengthens both comparisons. First, the ARS market failed when financial intermediaries stopped providing liquidity support (they were under no legal obligation to do so) as their internal risk profile changed because of losses incurred from the crisis. In an April 2020 report, the Bank for International Settlements (BIS) noted that ETF arbitrage was similarly impaired during the sell-off because dealers managed their own risks by providing “less support to corporate bond liquidity” in an attempt to “preserve balance sheet capacity in a context of increasing uncertainty.” Dealers wouldn’t take on additional credit risk, and they also widened their bid-ask spreads on underlying bonds, which contributed to steep price NAV discounts. Both ARS and ETF arbitrage breakdown show that discretionary liquidity is fragile in a crisis when it’s needed most.

Next, as noted above, the coronavirus pandemic resulted in significant price dislocations from NAV in credit and emerging market ETFs. Also, as mentioned, AP arbitrageurs didn’t quickly step in to remedy the discounts because of the difficulty (and opacity) operating in the underlying market. The breakdown of arbitrage in ETFs (at a time when it was needed) recalls the state of the market on October 19, 1987 as index futures and cash prices exhibited a significant decoupling when normally present arbitrageurs retreated since they couldn’t accurately assess prices in the midst of the panic.

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1484 Id.
1485 See Clements, supra note 1458 at 45-51.
1486 Id. at 49-51.
1487 Aramonte & Avalos, supra note 1472 at 4.
1488 Id.
1489 See Aramonte & Avalos, supra note 1472 at 1-4.
iii. Index Tracking Errors and Return Differentials

When comparing ETFs, an investor must look beyond historical returns, and evaluate the extent an ETF’s performance accurately reflects the underlying index it seeks to replicate. Performance deviation of an ETF from its index is a “replication risk,” also commonly known as “tracking error.” If an ETF consistently incurs tracking errors, then the “set it and forget it” investment ethos that powers passive indexing is largely undermined. Also, an investor needs to know the tracking errors of similarly named ETFs in order to compare products and make suitable investment decisions.

For example, a low fee ETF with significant tracking error will cause returns to deviate from what an investor otherwise expects. Year over year tracking errors have been reported in ETFs benchmarking high yield bonds and emerging market indices. The annual percentage lag of an ETF relative to its tracked index has also been called a “hidden” or “extra fee” that many investors may not even be aware of at all, and should be added to an ETF’s expense ratio as an “effective cost” to fully assess a fund. The factors that influence ETF tracking errors are diverse and include share repurchases and issuances, seasonal influences, spin-offs, index replication strategy and revisions, fund size, stock consolidation, dividend policy, seasonal factors, and premiums and discounts to net asset value. A recent working paper by scholars at the NYU Stern School of Business and St. John’s University suggests, however, that the “major determinants” in ETF performance differentials for

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1493 Id.; see Michaela Dorocáková, Comparison of ETF’s performance related to the tracking error, 10(4) JOURNAL OF INTERNATIONAL STUDIES, 154, 158 (2017)
1494 See Ortel, Kovarsky & Puca, supra note 1448.
1495 Fontinelle, supra note 1492.
1497 Ortel, Kovarsky & Puca, supra note 1448.
1498 Abramowicz, supra note 1496; see Steve Johnson, Why ‘tracking difference’ is a vital metric for passive ETFs, FINANCIAL TIMES (July 27, 2020), https://www.ft.com/content/80917014-0d39-438e-b3b8-cb645d3c2a43.
1499 Dorocáková, supra note 1493 at 154, 158-160.
funds that track similar indices are “the number of passive funds in the same family” as well as “the amount of securities lending they do.”\footnote{See Elton, Gruber & de Souza, supra note 1419 at 28.}

Tracking error must also be viewed “in context” because it can arise due to numerous factors including costs and chosen replication methods,\footnote{Fedorova, supra note 1417.} and cash management and settlement activities.\footnote{See infra Part I(ii)ff; see Comment Letter to SEC of Deschert LLP on File No. S7-15-18 (September 28, 2018), at 3, available at https://www.sec.gov/comments/s7-15-18/s71518-4458072-175786.pdf (“Dechert Comment Letter”), (“Specifically, without the ability to place T-1 orders, the following undesirable consequences could ensue: (i) ETFs would have cash received in a creation order remain uninvested for a day, thus hampering the ETFs ability to achieve its investment objective (and increasing index tracking error for index-based ETFs) for that day.”)} One of the reasons that tracking errors are prevalent in ETFs is because many indices are based on “market capitalization” and the number of securities per company are routinely in flux (given changes in value of the constituent shares).\footnote{See Fontinelle, supra note 1492.} Another factor that generates tracking errors are diversification rules that prevent an individual stock to comprise more than twenty five percent of the ETF’s underlying portfolio.\footnote{See Exchange Act, supra note 1425 at Section 11(d)(1), Rule 4e-5; Dechert Comment Letter, supra note 1502 at 10-11.} This is a particular problem for niche or specialized sector funds where its tracked index may not have similar constraints.\footnote{Fontinelle, supra note 1492.} Trading and management fees also create tracking error.\footnote{Id.}

Further, ETFs that use physical replication have been noted as being more prone to tracking error than those synthetically replicated with derivatives.\footnote{See Bourgi, supra note 1441.} Large samples (approaching full physical replication) are costly but reduce tracking error.\footnote{See Bocconis, supra note 1446.} As a result, “sampling” methods are often enhanced synthetically for optimization.\footnote{Id.} Finally, an ETF has a constant “trade-off” between minimized costs and ensuring efficient tracking, and as will be shown below, efforts to minimize tracking errors can result in larger trading premiums and discounts.\footnote{See infra Part I(b)(i).}
iv. The Proliferation of Custom, Affiliated and Bespoke Indexes

The universe of tracked indices seems ever-expanding and now features many thousands of product choices amongst asset (and multi-asset) classes, sectors, industries (including novel types like blockchain and cannabis), region and multi-regions, countries, commodities, currencies, a variety of credit themes (like bond type and duration), alternatives, and “styles” including volatility, factoring, inverse and leveraged.\footnote{See ETFDB.COM, ETF Directory, \url{https://etfdb.com/etfs/} (last visited July 11, 2020).} The modern proliferation of ETFs has also given rise to emerging concerns contesting whether index funds are in-fact “passive.”\footnote{See Robertson, supra note 1440.} Illuminating research from Professor Adrianna Robertson has revealed that “passive” ETFs aren’t passive at all, but rather what she calls “delegated management.”\footnote{See id. at 796-798 (“Rather than being passive in any meaningful sense, index investing simply represents a form of delegated management, whereby the investor (the principal) empowers a delegatee (her agent) to make decisions on her behalf. Instead of being truly passive, tracking an index almost always implies choosing a managed portfolio.”)} Robertson shows, that despite the vast majority of ETF’s having a “primary objective” of tracking an index,\footnote{See id. at 833, Robertson reports that out of a sample of 571 U.S. ETFs, 553 of them were “index based” or designed to track a particular index – see id. fn.139.} a “substantial fraction” of such ETFs track a bespoke index created by the ETF manager or an affiliate.\footnote{See id. at 833, 836.} She warns, given this compositional “heterogeneity,” that investors should proceed cautiously when assessing “baselines” or benchmarks as measurement mechanisms.\footnote{See id. at 797-798, 805-806.} More troubling, Robertson finds empirical support, warranting more investigation, that ETF managers may take advantage of “unsophisticated” investors by displaying similar management fees as other ETFs (a metric investors are oft attuned to) but including the costs of affiliate licensing in more opaque expense ratios.\footnote{See id. at 834-835 (“Ultimately, I find evidence most consistent with the second explanation—that managers are taking advantage of the popularity of ETFs and that investors are primarily concerned with management fees.”); see at 841.}

b. Variable Financial, Operational & Management Practices

This subsection will show how ETF sponsors use non-standardized and inconsistent NAV calculation methodologies; outline problems when APs utilize customized baskets in their arbitrage activities; assess difficulties in determining
daily ETF portfolio compositions; identify structural distinctions across ETFs; highlight challenges for investors when comparing fees and liquidity in ETF peers; note the opacity in securities lending profit pass-throughs; and identify several variable cash management and liquidity operations of ETF sponsors.

i. Inconsistent Net Asset Value Calculation Methodologies

In order to accurately evaluate and compare ETFs, an investor must know a fund’s NAV per share (which when calculated during the trading day is called “intraday indicative value or “IIV”). A fundamental challenge for investors comparing ETFs is that there isn’t a standardized methodology for calculating IIV, and as noted by the SEC it can be “calculated in different and potentially inconsistent ways.” ETF analyst Elisabeth Kashner has argued that conflicting NAV calculation methods make it extremely difficult to undertake a true side-by-side ETF performance comparison. Kashner notes, “NAVs can be designed to minimize calculated tracking difference or premium / discount” and suggests that choosing one method eliminates an ETFs ability to minimize the other.

She posits that ETF performance comparisons are at times “impossible” because, due to often undisclosed calculation methodologies, “return difference might be explained by FX conversion times rather than economic exposure.” In support of her argument she shows how two ETFs (Schwab Emerging Markets

1518 See Rule 6c-11, supra note 1424 at 61-63.
1519 Id. at 63.
1521 Kashner, Will the Real, supra note 1520 (“For two-thirds of all U.S. ETFs, the choice is a bitter one. Aligning strike times with capital market closings minimizes premiums/discounts but can wreak havoc with tracking difference. Synchronizing with benchmark valuation tightens tracking difference but blows out premium/discount results.”); See Elton, Gruber & de Souza, supra note 1419 at 7.
1522 Kashner, Will the Real, supra note 1520.
Equity ETF\textsuperscript{1523} and \textit{Invesco PureBeta FTSE Emerging Markets ETF}\textsuperscript{1524} which both track the \textit{FTSE Emerging Index}, have different NAV calculation methods and significantly similar underlying portfolios, and that this is commonly the case for a variety of ETF styles across fund issuers.\textsuperscript{1525} Kashner suggests the only viable solution is a standardized requirement for both NAV calculation methods.\textsuperscript{1526} Unfortunately, the SEC did not mandate a standardized NAV calculation methodology (or address the two prongs noted by Kashner) in Rule 6c-11.\textsuperscript{1527} IIV calculation variability was also identified by investment manager \textit{Eaton Vance} in their comment letter to Rule 6c-11, who called on the SEC to adapt better disclosure requirements for how ETFs calculate their daily NAV.\textsuperscript{1528} Eaton Vance advocated that without more context and description on how an ETF calculates its NAV, “the utility of its premium/discount disclosures significantly diminishes.”\textsuperscript{1529}

\textit{ii. Customized Baskets and Daily Basket Delivery Opacity}

Rule 6c-11 increased the flexibility of APs to negotiate and deliver customized asset baskets (including baskets comprised of cash), which may not align, \textit{pro rata}, with disclosed ETF portfolio holdings, in the redemption and

\textsuperscript{1525} Kashner, Will the Real, supra note 1520 (Kaschner identifies that Vanguard, Invesco, First Trust, VanEck, ProShares and JP Morgan normally apply “end of day” valuation methodologies to “align strike times with capital market closes” while BlackRock, State Street Global Advisors (SPDR), Charles Schwab, WisdomTree, PIMCO and Northern Trust synchronize their valuations with benchmark valuations.)
\textsuperscript{1526} Id.
\textsuperscript{1527} See Rule 6c-11, supra note 1424 discussion at 64-66; see infra Part III(i).
\textsuperscript{1528} See Comment Letter to SEC of Eaton Vance Corp. on File No. S7-15-18 (October 4, 2018), at 10, available at https://www.sec.gov/comments/s7-15-18/s71518-4486351-175882.pdf (“Eaton Vance Comment Letter.”) (“As part of the current rulemaking process, we believe the Commission should consider adopting requirements for ETFs to better disclose how they calculate daily NAVs. We are aware of two significant differences in valuation practices among ETF sponsors: (a) whether the ETF normally values portfolio holdings that trade on markets that are closed at the time the ETF’s NAV is determined (generally 4:00 PM eastern time) based on local market closing prices (Local Close Pricing) or whether the ETF routinely adjusts valuations from local market closing prices to reflect subsequent market movements (Fair Value Pricing); and (b) whether the ETF’s fixed income holdings are generally valued at the bid side of the market (Bid Pricing) or at the midpoint of the bid-ask spread (Mid Pricing)”)
\textsuperscript{1529} Id.
creation process.\textsuperscript{1530} The use of customized baskets is intended to make ETF arbitrage, creations and redemptions more efficient,\textsuperscript{1531} and alleviate the “day to day frictions” associated with APs procuring an ETF’s constituent holdings (which vary in availability).\textsuperscript{1532} It’s also said to facilitate faster redemptions and creations.\textsuperscript{1533} The problem, however, is that the new rule could benefit large financial institutions to the detriment of retail investors since it may exacerbate tracking error if an ETF sponsor accepts cash or other collateral that doesn’t match the index.\textsuperscript{1534} It could also create a conflict, which might harm ETF investors, if an AP either “cherry-picked” (pressured the ETF sponsor to give them desirable securities during a redemption) or “dumped” (pressured the ETF sponsor to accept securities they otherwise want to liquidate).\textsuperscript{1535} Customized baskets also introduce a form of “correlation risk” since the actual composition of the underlying basket could deviate from the index it tracks.\textsuperscript{1536}

An ETF sponsor that accepts cash in the basket delivery or redemption process potentially introduces tracking error, unless the cash is quickly reinvested in the constituent index securities.\textsuperscript{1537} A December 2019 study by the Bank of Canada indicated that cash substitution was a growing trend in U.S. credit ETFs before the coronavirus crisis, especially for new ETF issuers.\textsuperscript{1538}

\textsuperscript{1530} See Rule 6c-11, supra note 1424 at 80-81. The rule does, however, establish requirements on the APs who wish to use custom baskets (“In addition, as proposed, the rule will provide an ETF with flexibility to use “custom baskets” if the ETF has adopted written policies and procedures that: (i) set forth detailed parameters for the construction and acceptance of custom baskets that are in the best interests of the ETF and its shareholders, including the process for any revisions to, or deviations from, those parameters; and (ii) specify the titles or roles of employees of the ETF’s investment adviser who are required to review each custom basket for compliance with those parameters.”)


\textsuperscript{1533} Id.

\textsuperscript{1534} Id.

\textsuperscript{1535} Id.; see Rule 6c-11, supra note 1424 at 82-83.

\textsuperscript{1536} See Kaminska, A Little ETF Rule, supra note 1532.

\textsuperscript{1537} See Izabella Kaminska, What’s Really In Your ETF Basket? FINANCIAL TIMES (February 9, 2020) - https://ftalphaville.ft.com/2020/02/07/1581077071000/What-s-really-in-your-ETF-basket--/.

\textsuperscript{1538} See Rohan Arora, Sebastien Betermier, Guillaume Ouellet Leblanc, Adriano Palumbo & Ryan Shotlander, Creations and Redemptions in Fixed-Income Exchange-Traded Funds: A
When fixed-income ETFs utilize cash for redemptions or creations they depart from an “in-kind” transfer model, and this “transfers the liquidity risk from the ETFs to the authorized participants (APs), which are typically financial institutions.”\(^{1539}\) Cash redemption, however, creates liquidity risk, and a “first-mover” problem because of the potential for “redemption runs” if an underlying basket of securities deteriorates in quality and liquidity (a phenomenon which isn’t present in an in-kind model).\(^{1540}\) It’s been argued that ETF disclosures don’t effectively capture how this liquidity risk gets “transferred” from dealers to ETF investors when ETF sponsors accept cash redemptions.\(^{1541}\)

In the early days of the ETF industry, AP customized basket delivery was common; however, after 2006 the SEC levied restrictions on basket delivery composition “requiring they generally corresponded pro rata to the advertised portfolio holdings.”\(^{1542}\) Also, basket customization is common in European ETF markets.\(^{1543}\) Rule 6c-11 affirmed the longstanding requirement for ETFs to prominently disclose on their websites portfolio holdings, in a standardized format, used to calculate an ETF’s NAV, and such information would be “publicly available and free of charge.”\(^{1544}\) Standardized disclosure of ETF portfolio holdings garnered much industry support,\(^{1545}\) although there were


\(^{1539}\) Id.

\(^{1540}\) Id. (“When ETF shares are redeemed in kind, the fund manager delivers a basket of bonds and does not have to liquidate its bonds to meet investors’ requests to redeem. Consequently, the first-mover advantage, in which investors have an incentive to redeem ahead of others, does not exist in the in-kind model.”)

\(^{1541}\) See Kaminska, What’s Really, supra note 1537.

\(^{1542}\) Kaminska, A Little ETF Rule, supra note 1532; see Rule 6c-11, supra note 1424 at 81-82.

\(^{1543}\) See Kaminska, What’s Really, supra note 1537.

\(^{1544}\) See Rule 6c-11, supra note 1424 at 68 & 97.

concerns about the potential to “front run” or “piggy-backing” on portfolio disclosures.\textsuperscript{1546} Rule 6c-11 does not, however, require ETF issuers to disclose their customized baskets.\textsuperscript{1547} In addition to citing increased costs, the SEC suggested that customized basket creation and redemption information is available from the \textit{National Securities Clearing Corporation}, the AP, or an ETF itself.\textsuperscript{1548} This may be a tenuous justification, however, since retail investors incur significant costs and difficulties obtaining this information; as such, it’s been suggested that the rule creates a “privileged access” that favors investment institutions over investors.\textsuperscript{1549}

\textit{iii. Product Structural Distinctions and Share Classes}

While ETFs may share the arbitrage mechanism, there is variation on the most common structures. Structure is important when ETFs track similar underlying assets because of distinctions in governance, internal operations (like securities lending), dividends, use of derivatives, cash management, taxation, termination dates, which can affect performance (NAV premiums and discounts and index tracking errors).\textsuperscript{1550} The most common ETF structure in the U.S. is the “open-end fund”\textsuperscript{1551} - the same classification as mutual funds registered under the ICA\textsuperscript{1552} with additional parameters under the \textit{Securities Act of 1933}\textsuperscript{1553} and the \textit{Securities Exchange Act of 1934}.\textsuperscript{1554} Other ETF structures include Unit Investment Trusts (UIT), Grantor Trusts, Limited Partnerships (LPs), C

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\textsuperscript{1546} See Rule 6c-11, \textit{supra} note 1424 at 69; Invesco Comment Letter, \textit{supra} note 1425 at 14.
\textsuperscript{1547} See Rule 6c-11, \textit{supra} note 1424 at 94 (“After considering comments, however, the Commission is not including a basket publication requirement in rule 6c-11.”)
\textsuperscript{1548} Id. at 95.
\textsuperscript{1549} Kaminska, \textit{A Little Rule}, \textit{supra} note 1532.
\textsuperscript{1550} See Aaron Levitt, \textit{The 7 Different ETF Structures}, ETFDB.COM (April 20, 2016), https://etfdb.com/portfolio-management/the-7-different-etf-structures/; \textit{see supra} Part I(i)(b) & (c).
\textsuperscript{1551} Id.; \textit{See Rule 6c-11, supra} note 1424 at 154 (“ETFs are predominantly structured as open-end funds.”)
\textsuperscript{1552} \textit{See supra} note 1425.
\textsuperscript{1553} Id.
\textsuperscript{1554} Id.; \textit{see Dechert Comment Letter, supra} note 1502 at 7-8 (“the ETF structure – in which ETFs simultaneously issue new shares on a continuous basis while the ETF’s shares trade on an exchange – is not specifically contemplated by the Exchange Act. Accordingly, ETFs generally seek relief from certain Exchange Act sections and rules.”)
Corporations, and Exchange Traded Managed Funds (ETMFs).\textsuperscript{1555} Related are exchange traded notes (ETNs), which are unsecured debt instruments that provide a return based on an underlying reference or index.\textsuperscript{1556}

Another particular structural distinction is the idiosyncratic nature of Vanguard’s “share class” design which, as noted by Professors Henry Hu and John Morley may confer some advantages on the company.\textsuperscript{1557} They state, “[a] share class ETF can be created when a conventional mutual fund issues a new class of shares to be traded on an exchange and purchased and redeemed in a process resembling the creation and redemption process for an ETF.”\textsuperscript{1558} They add that share class ETFs may have advantages over other funds including “the ability to spread costs over a larger pool of assets,” and “the ability to manage cash more efficiently” against a wide redemption pool.\textsuperscript{1559}

\textit{iv. Hidden Fees, Liquidity Rents and “Costs in Context”}

ETFs are commonly marketed for their “low cost” value proposition.\textsuperscript{1560} They are generally “cheaper” than mutual funds,\textsuperscript{1561} with lower administrative costs.\textsuperscript{1562} Fees in ETFs are extremely competitive across fund companies, and are effectively a very small proportion of assets under management.\textsuperscript{1563} Some scholars, however, posit that this hyper-competitive fee environment is contributing to ETF sponsors underinvesting in governance and stewardship, and excessively deferring to corporate managers.\textsuperscript{1564}

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\textsuperscript{1555} See Levitt, supra note 1550.
\textsuperscript{1557} See Hu & Morley 1, supra note 1459 at 883.
\textsuperscript{1558} See Hu & Morley 2, supra note 1459 at 1168.
\textsuperscript{1559} Id. at 1168-1169.
\textsuperscript{1561} Mutual funds have been criticized in recent scholarship as levying excessive fees to the detriment of investors, see Stewart Brown & Steven Pomerantz, Some Clarity on Mutual Fund Fees, 20 U. PA. J. BUS. L. 767, 812 (2018)
\textsuperscript{1562} Stoyan Bojinov, Why are ETFs so Much Cheaper Than Mutual Funds, ETFDB.COM (June 24, 2015), https://etfdb.com/etf-education/etfs-vs-mutual-funds-why-etfs-are-cheaper/.
\textsuperscript{1564} See id at 2055, 2057-2058
costs” in ETFs that investors must understand in order to make effective product comparisons.\textsuperscript{1565} Some of these may be opaque or unfamiliar like advisory and index licensing fees.\textsuperscript{1566}

In order to compare ETFs side-by-side it’s necessary to look at “costs in context” across similar funds.\textsuperscript{1567} To do so, an ETF investor must first identify the index replication method an ETF issuer is using for a fund.\textsuperscript{1568} For example, if an ETF issuer is using an “optimization” or sampling method to lower costs, then the index isn’t fully replicated.\textsuperscript{1569} As a result, a sampling-style ETF risks incurring tracking errors (which is a “hidden” cost for an ETF investor) if the excluded securities outperform, resulting in a chosen ETF sample deviating from its benchmark index.\textsuperscript{1570} In making a relative cost assessment between funds it is also necessary to understand “turnover” as this can increase commission expenses in an ETF.\textsuperscript{1571}

ETF price dislocations from NAV (premiums or discounts) highlighted above,\textsuperscript{1572} also create an overlooked cost for ETF investors.\textsuperscript{1573} In other words, if an investor purchases an ETF at a premium (and / or sells the ETF at a discount) this acts as a significant cost against an investor’s “realized return.”\textsuperscript{1574} A 2016 \textit{Journal of Portfolio Management} study showed that during periods of ETF price dislocation “deviations from NAV are often much greater than the

\begin{footnotes}
  \textsuperscript{1565} See Bocconis, \textit{supra} note 1446.
  
  \textsuperscript{1566} See Robertson, \textit{supra} note 1440 at 837-841.
  
  
  \textsuperscript{1568} Fedorova, \textit{supra} note 1417.
  
  \textsuperscript{1569} Id.
  
  \textsuperscript{1570} See Ben Johnson & Christine Benz, \textit{Don’t Overlook These Hidden ETF Costs}, MORNINGSTAR (March 14, 2017), https://www.morningstar.com/articles/796870/dont-overlook-these-hidden-etf-costs. (highlighting how such “sampling error” manifested in the BlackRock iShares MSCI Emerging Markets ETF.)
  
  \textsuperscript{1571} Id.; see Kuepper, \textit{supra} note 1567.
  
  \textsuperscript{1572} See \textit{supra} Part I(a)(ii).
  
  \textsuperscript{1573} See Eaton Vance Comment Letter, \textit{supra} note 1528 at 8-9 (“Accordingly, we believe the cost to buy or sell an ETF’s shares is appropriately measured by the difference between an investor’s all-in purchase or sale price and the value per share of the fund’s net assets at the time the trade price is determined. Over an investor’s full holding period, his or her trading costs sum to the difference between the return of the ETF itself over the period and the investor’s realized return. In addition to any commissions that apply, the cost to buy an ETF includes the premium to current value at which shares are acquired, and the cost to sell an ETF includes the discount from current value at which shares are sold.”)
  
  \textsuperscript{1574} Id. at 9.
\end{footnotes}
bid-ask spreads suggest.” 1575 Thus investors may not be aware of such “transaction costs” when they go to trade.1576

ETFs that track the same index often have different expenses.1577 Recent research has revealed that higher fee ETFs can not only survive, but thrive, if they are more liquid in the secondary market than their lower fee counterparts.1578 For example, the study notes that State Street Global Advisors SYP ETF (that tracks the S&P 500) has nearly twice the assets under management, twenty times the daily trading volume, and ten times higher turnover, despite being nearly twice as expensive as peer indexes tracking the S&P 500.1579 This is because higher fee, more liquid ETFs, attract shorter-term traders who are “relatively insensitive to the fee,” and this has significant implications for investors because when multiple ETFs compete around the same index, secondary market liquidity is spread between the competing funds.1580 The authors posit that since liquidity originates in the secondary market, and is not controlled by the ETF issuer, there is a form of “prisoner’s dilemma” between investors, and a “first mover” advantage for ETF sponsors.1581 Most notably they identify an opportunity for an ETF sponsor to “extract a rent (via

1576 Id.; see Antti Petajisto, Inefficiencies in the Pricing of Exchange-Traded Funds, 73(1) FINANCIAL ANALYSTS JOURNAL 24, 24 (2017) available at https://www.cfainstitute.org/en/research/financial-analysts-journal/2017/inefficiencies-in-the-pricing-of-exchange-traded-funds (“the difference between [an ETF’s] share price and the value of the underlying portfolio is often economically significant, indicating that the unsophisticated investor may face an unexpected additional cost when trading ETFs.”); see Eaton Vance Comment Letter, supra note 1528 at 9 (“variations in ETF premiums and discounts often contribute far more to the trading costs paid by ETF investors than commissions, bid-ask spreads and market impact combined.”)
1577 This phenomenon is clearly evident when you compare the fees of three large ETFs which track the same S&P 500 Index. The Vanguard S&P 500 ETF (VOO) has an expense ratio of 0.03% (see Vanguard S&P 500 ETF, https://investor.vanguard.com/etf/profile/fees/voov, accessed July 7, 2020); The BlackRock iShares Core S&P 500 ETF has an expense ratio of 0.03% (see BlackRock iShares Core S&P 500 ETF, https://www.ishares.com/us/products/239726/ishares-core-sp-500-etf, accessed July 7, 2020); and the State Street Global Advisors SPDR® S&P 500® ETF Trust has an expense ratio of 0.0945% (see SPDR® S&P 500® ETF Trust, https://www.ssga.com/us/en/individual/etfs/funds/spdr-sp-500-etf-trust-spy, accessed July 7, 2020).
1579 Id. at 1.
1580 Id. at 2.
1581 Id. at 1-2.
their fee) from the liquidity externalities of their client.”

This research helps to illuminate why the largest ETFs can maintain relatively high fees despite a “race to the bottom” in fee structures by new ETF issuers.

v. Securities Lending and Profit Pass-Through or Reservation

Securities lending by ETF firms has significantly increased in the U.S. since the 2008 global financial crisis. Securities lending, together with credit default swaps, were two principle factors in the downfall of AIG in the 2008 crisis. The practice has been described as both a “hidden source of return” for ETF sponsors, and the “best-kept secret in the ETF business.” Mutual funds and pensions often lend out the securities they hold, and this has particular appeal for short sellers in search of high demand stocks. ETF investors may potentially benefit from fees generated from securities lending (in the form of reduced costs); however, they are also exposed to new risks – like counterparty default, and potentially insufficient or “mismatched” collateral. The amount of profit that passes through to ETF investors is

1582 Id. at 2.
1583 Id.
1585 See Robert McDonald & Anna Paulson, AIG in Hindsight, 29(2) J. OF ECON. PERSPECTIVES 81, 81-95 (2015).
1588 Id.
1589 Id.
1592 See BlackRock Securities Lending, supra note 1590; Attracta Mooney, Stock Lending By ETF Operators Worries Investors, FINANCIAL TIMES (February 4, 2018), https://www.ft.com/content/d4706b0e-e40a-11e7-a685-5634466a6915; See Adam
varied amongst ETF sponsors, and is not always clear from disclosures. Also, not all ETFs structures can use securities lending, for example it is prohibited in ETFs that are organized as UITs.

Securities lending in ETFs can expose investors to many risks including losses from “mismatched” collateral, counter-party risk (relating to firms ETF sponsors lend securities to), and recovery risks, costs or delays if lent securities are difficult to trace in a borrower operational failure. As a result, many ETF investors may want to know the extent, and details, of such activities by competing ETF sponsors when comparing products – beyond mere expense reduction. Consider an ETF investor looking to compare small capitalization ETFs trading on U.S. markets for their securities lending practices. Despite encountering overwhelming product choice ex ante, our investor compares three small cap ETFs with the highest assets under management in this product segment from three ETF sponsors (Blackrock, Vanguard and Schwab).

None of the ETF’s websites, or fact sheets, contains information on securities lending. The first mention of securities lending for BlackRock and Schwab is merely boilerplate, without fund specific details, and found in the summary prospectus (Vanguard’s summary prospectus was silent). It is only in the exceedingly dense Statement of Additional Information (SAI), which aggregates...
data for numerous sponsored funds concurrently, where financial details for securities lending is provided for these specific ETFs.\footnote{\textsuperscript{1600}}

\textit{vi. Variable Cash Management, Liquidity Operations and Failure to Deliver}

Another challenge in comparing ETFs is the significant variation in cash management, dividend reinvestment and timing practices amongst ETF sponsors.\footnote{\textsuperscript{1601}} This includes reinvestment turn-around time when an ETF accepts cash in a customized AP basket exchange.\footnote{\textsuperscript{1602}} Also, open-ended ETFs registered as investment companies can reinvest dividends and interest; however, ETFs organized as UITs (like \textit{State Street Global Advisors SPDR S&P 500 ETF Trust}\footnote{\textsuperscript{1603}}) cannot reinvest but must payout cash dividends, and this can “create a cash drag during rising markets.”\footnote{\textsuperscript{1604}} This distinction, along with restrictions on securities lending and the use of derivatives can cause UITs to deviate in performance from open-ended ETFs tracking similar underlying.\footnote{\textsuperscript{1605}} ETFs allowing for cash redemptions may also find a drag on performance, due to larger cash positions.\footnote{\textsuperscript{1606}}

Larger ETFs can also have significant “liquidity advantages” for their investors, and liquidity differentials can affect the “total return” of investors due to reduced trading costs.\footnote{\textsuperscript{1607}} Liquidity is “often misunderstood” with ETFs, and

\footnotesize
\begin{itemize}
\item \textsuperscript{1600} Compare \textit{BlackRock iShares® Trust Statement of Additional Information} (August 1, 2019 as revised June 25, 2020), \textit{Vanguard Index Funds Statement of Additional Information} (April 28, 2020), \textit{Schwab® Equity ETFs, Statement of Additional Information} (December 18, 2019).
\item \textsuperscript{1601} See Bourgi, \textit{supra} note 1441.
\item \textsuperscript{1602} See Arora et al., \textit{supra} note 1538.
\item \textsuperscript{1604} Levitt, \textit{supra} note 1550; See James Chen, \textit{Dividend Drag}, INVESTOPEDIA (July 3, 2018), https://www.investopedia.com/terms/d/dividend-drag.asp (“Dividend drag is a negative effect of the dividend structure of a unit investment trust (UIT), a type of unmanaged exchange-traded fund (ETF), in a rising market. SEC rules stipulate that unit investment trusts, which require no board of directors, must pay out profits as cash dividends to investors instead of reinvesting in the portfolio. In a rising market, this means the ETF will underperform similar funds with the ability to reinvest.”)
\item \textsuperscript{1605} See Levitt, \textit{supra} note 1550; Rule 6c-11, \textit{supra} note 11 at 19.
\item \textsuperscript{1606} See Rule 6c-11, \textit{supra} note 1424 at 83.
\item \textsuperscript{1607} See Bebchuk & Hirst, \textit{The Specter, supra} note 1435 at 729.
\end{itemize}
opaque concepts like “implied liquidity” are more reflective of the actual liquidity of an ETF than commonly cited metrics like “average daily volume.” Professors Lucian Bebchuck and Scott Hirst, in a recent study on the ominous growth of the “giant three” ETF issuers (BlackRock, Vanguard and State Street) note, “[a]n ETF, with fewer assets can be expected to have lower liquidity and more significant bid-ask spreads than a larger ETF, which will operate to reduce the total return the investor will enjoy from holding the ETF.” The authors suggest that such a phenomenon confers both a “first-mover” and a “network” benefit on large incumbent ETF issuers. Another operational challenge that undermines the ability of investors to make easy performance comparisons is the propensity of “failures to deliver” (FTD) in some ETFs. FTD has been documented as occurring in ETFs when an AP engages in an “operational shorting” strategy, and also contributing to increased market volatility. The possibility of FTD can lead to increased costs for investors who buy and hold ETFs.

c. Naming and Product Composition Inconsistencies & Firm Marketing Activities

1608 Implied liquidity measures “what can be potentially traded in ETFs based on its underlying assets” See Bourgi, supra note 1441.
1609 Bourgi, supra note 1441.
1610 Bebchuk & Hirst, The Specter, supra note 1435 at 729.
1611 Id.
1612 A “failure to deliver” occurs when a short seller “does not own the underlying assets and so cannot make the delivery” see Gordon Scott, Failure to Deliver, INVESTOPEDIA (August 2, 2019) https://www.investopedia.com/terms/f/failuretodeliver.asp.
1613 See Richard B. Evans, Rabih Moussawi, Michael S. Pagano, & John Sedunov, ETF Short Interest and Failures-to-Deliver: Naked Short-Selling or Operational Shorting? DARDEN BUSINESS SCHOOL WORKING PAPER NO. 2961954 (November 20, 2018), at 35, available at SSRN: https://ssrn.com/abstract=2961954 (the authors describe an “operational short” as “the AP sells ETF shares but postpones their creation and delivery, which delay is effectively a form of short-selling. The AP owes or is short the ETF shares until they ultimately deliver those shares to the investor who purchased them in the secondary market.”)
1615 See Comment Letter to SEC of Professor James J. Angel, on File No. S7-15-18 (October 1, 2018), at 6, available at https://www.sec.gov/comments/s7-15-18/s71518-4467037-175796.pdf (“Angel Comment Letter”); (“fails to deliver do cause harms to other investors: long investors who are failing to receive are deprived of the stock lending revenue they could otherwise generate.”)

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This subsection will identify investor comparative challenges from not having a universal naming convention in ETFs. It will introduce the concept of index composition risk, highlight marketing practices of ETF sponsors that contribute to investor confusion, and identify emerging issues with ETF “model portfolios”, and active, non-transparent and “smart-beta” ETF structures.

i. A Lack of Naming Conventions and Index Composition Consistency Risk

Rule 6c-11 didn’t impose a standardized nomenclature to distinguish ETFs from levered or inverse exchange traded products (ETPs),1616 or exchange traded notes (ETNs) which are unsecured debt instruments that provide a return linked to a reference entity or basket (using swap contracts or other derivatives).1617 Recently “investment giants” BlackRock, State Street and Invesco called on exchange data feeds (Nasdaq, NYSE Arca and CBOE Global Markets) to adopt a precise and narrowed definition of an ETF that didn’t include ETNs, levered or inverse ETPs, or tradable products with commodity derivatives exposure.1618 This proposal mirrors prior scholarly calls for a clear regulatory definition of an ETF.1619 This distinction is important because ETPs and ETNs have unique risks – like credit risk of an issuing bank in the case of an ETN.1620

Name confusion impairs ETF product comparisons since two funds, which have similar names and track similar indices, can actually be comprised of very different securities and composite weights.1621 It is also very challenging to compare, side-by-side, ETFs with “idiosyncratic objectives” or country-specific varieties, since they may have heterogeneous holdings, despite similar names.1622 For example, consider two ETFs with similar names, both offering total market singular country exposure to Israel (the VanEck Vectors Israel

1616 See Rule 6c-11, supra note 1424 at 116-118.
1619 See Hu & Morley 2, supra note 1459 at 1162.
1620 See Fidelity, supra note 1617.
1621 See Ortel, Kovarsky & Puca, supra note 1448.
1622 Id.
ETFs, and the BlackRock iShares MSCI Israel ETF, on the date of inquiry had different portfolio weights for top holdings, and varied sector exposures. Relatedly, some stocks can be characterized, concomitantly, as dividend, growth, and value. One market participant analogized ETFs as a “vaudeville act” and analogized certain stocks (like Exxon) - used in multiple ETF types - as “a kind of ETF Swiss Army Knife.” In other cases, ETFs that have the semblance of diversification (on the basis of their name) can be quite heavily weighted in only a very few stocks.

Further, an ETF’s name may not align with investor intuition. A recent Canadian report noted that “value” ETFs often don’t contain “true value stocks.” Another industry report noted that BlackRock’s iShares Emerging Markets Minimum Volatility ETF has had at times a lower “beta” than the actual S&P 500, and that this defies logic. The problem of “composition risk”

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1625 On the date of inquiry (July 8, 2020) the ETFs had notably varied sector exposure weights. VanEck’s top four sectors were Information Technology (45.2%), Financial (16.6%), Health Care (14.1%), and Real Estate (6.3%); BlackRock’s top four sectors were Information Technology (40.77%), Financials (20.18%), Health Care (10.61%) and Real Estate (9.09%). See supra notes 200 & 201.
1626 See GRANT’S INTEREST RATE OBSERVER, On the ETF Divide, Volume 34, No. 19b (October 14, 2016).
1627 Id. at 2.
1628 Id. 2; see Satyajit Das, These are just some of the ways ETFs and index funds are making financial markets more unstable, MARKETWATCH (May 16, 2020), https://www.marketwatch.com/story/etfs-and-index-funds-have-made-financial-markets-more-unstable-2020-05-15; Consider, for example, the case of BlackRock iShares U.S. Energy ETF, https://www.ishares.com/us/products/239507/ishares-us-energy-etf (accessed July 8, 2020), which despite the semblance of diversification in its name had, at the time of inquiry, over 45% of its entire portfolio invested in only two stocks, Exxon Mobil Corp. and Chevron Corp.
1631 The term “beta” is commonly used to measure a “stock’s volatility in relation to the overall market.” See Ben McClure, What Beta Means When Considering a Stock’s Risk, INVESTOPEDIA (February 18, 2020), https://www.investopedia.com/investing/beta-know-risk/.
1632 See Grant’s Interest Rate Observer, supra note 1626 at 3. (suggesting that it goes against intuition for the S&P 500’s beta to be higher than an emerging market index since the latter contained global exposure with “geopolitical” risk).
(where investors compare two similarly named ETFs with different underlying assets) plagues industry and sector ETFs like healthcare.\(^{1633}\) Naming precision is also relevant in light of recent troubles in leveraged and other funds holding exposures to commodity futures like oil.\(^{1634}\) For instance it’s been suggested that investor harm in oil ETFs during the coronavirus pandemic sell off in March 2020 could have been averted (at least mitigated) had the *USCF United States Oil Fund* (USO),\(^{1635}\) been named the “United States Oil Futures Fund.”\(^{1636}\)

**ii. Marketing Practices of ETF Sponsors that Contribute to Investor Confusion**

Investor difficulty comparing ETFs is exacerbated by the marketing practices of ETF sponsors and investment advisors. Studies on mutual fund choice provides evidence that fund selection is influenced by marketing and “salesmanship.”\(^{1637}\) The same logic applies to ETFs. The SEC recently fined *Wells Fargo* $35 million for marketing poorly-suited inverse ETFs to clients between 2012 and 2019.\(^{1638}\) Advisors can also easily hype-up thematic ETFs, many of which end up closing, without providing adequate details to clients of potential tax consequences if the funds liquidate.\(^{1639}\)

ETF sponsors may also look to leverage the nascent popularity of socially responsible and sustainable investing.\(^{1640}\) This trend relies on a variety of terms or acronyms including “impactful,” “sustainable,” “ESG” (environmental, social and governance), “SRI” “green,” “inclusion,” “exclusion,” “philanthropic,” and

\(^{1633}\) See Bourgi, *supra* note 1441.


\(^{1636}\) Riquier, *supra* note 1634.


\(^{1639}\) *Id.*

“socially responsible,” among others. In July 2020, industry aggregator ETF.com listed 109 ETFs trading in the U.S. which included a “socially responsible” mandate. An October 2019 report from the Institute for International Finance suggests that the “sheer proliferation” of such terms is causing investor confusion. The report lists 80 different characterizations of sustainable investment products, and states at best the investment industry is “inadvertently” confusing investors, and at worse “greenwashing” or “intentionally misleading” them about how such investments relate to sustainability.

Recent industry research on global investor behavior adds that actual investments in sustainable finance is “significantly lagging” the expressed intentions of those wanting to invest in the sector; and that “independent ratings confirming that the fund takes a sustainable approach” would help in this regard. This recommendation aligns with prior reports suggesting “a lack of information or understanding” prevents sustainable investments.

iii. ETF “Model Portfolio” Compositional Opacity and Comparative Challenges

The ability to “comparison-shop” is particularly challenging in the emerging ETF “model portfolio” industry. These “prepackaged investment

1641 Id.
1644 Id. at 1-2.
portfolios,” that use ETFs as component parts rather than individuals stocks, mutual funds or bonds, have surged in popularity (lockstep with the expansion of available ETF products) and are widely marketed by banks, discount brokers and fintech “robo-advisory” platforms.\textsuperscript{1648} The universe of available ETF products has grown so vast that many investors prefer to “outsource” portfolio composition decisions.\textsuperscript{1649} Such a move requires an investor to “go beyond fees and gauge performance” when evaluating what pre-packaged portfolio to purchase, and this presents significant challenges.\textsuperscript{1650}

The rules governing “side-by-side comparisons” for ETF model portfolios are sparse, largely non-compulsory, and generally fall within the SEC’s adviser advertising rules governing false or misleading statements.\textsuperscript{1651} As such, it is extremely difficult for an individual investor to engage in an apples-to-apples comparison since some firms choose not to report their performance, there is no uniform accounting standard, and the portfolios themselves have “varying degrees of customization.”\textsuperscript{1652} The tools to perform such a comparison may be are available, but generally exist behind expensive paywalls like Morningstar and because of costs are largely inaccessible to many investors.\textsuperscript{1653}

iv. Comparative Challenges with Smart Beta and Non-Transparent ETFs

Finally, a new frontier of ETF products including “smart beta” (also known as “factor” based), active, and non-transparent funds create unique challenges for investor comparisons. A “smart beta” ETF is a “long only” portfolio that includes a “factor tilt” (such as growth or value).\textsuperscript{1654} Smart beta ETFs are often devised around “rules” such as “momentum” or “volatility” or factors (such as value, growth or dividend).\textsuperscript{1655} This distinguishes smart-beta ETFs from conventional structures that are weighted by market

\textsuperscript{1648} Id.
\textsuperscript{1649} Id.
\textsuperscript{1651} See Loder, supra note 1647.
\textsuperscript{1652} Id.
\textsuperscript{1653} Id.
Many smart-beta ETFs use a combination of factors, described as a “mixture” of both active and passive management. In addition to leveraging academic research which suggests factoring is associated with higher returns, smart-beta funds look to mitigate the high fees and general opacity associated with active funds and the tracking errors in passive structures.

Smart beta ETFs have shown to be “wildly inconsistent” in their performance, and have not shown evidence of outperforming passive strategies, despite their higher fees. They have also exhibited significant secondary market price premiums and discounts to NAV. One analyst calls this emerging ETF sector part of a finance “reality distortion field” that is more about marketing than actual performance. The way that these ETFs are constructed widely vary, and the academic support backing smart beta often doesn’t factor in transaction costs which erode returns. Also, there is evidence that investors don’t really understand the factors that generate the “best return,” or at least don’t exhibited it in their investment choices. One industry report recently noted that marketing certain factors (like “growth”) seem to attract as much investor money as those focused on “value”, despite the former not showing excess returns empirically. Momentum strategies attract little investor capital despite empirical support for higher returns. Smart-beta ETFs are also very difficult to compare side-by-side because there are limited products in factor types, and disproportional holdings within classifications.

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1657 Id.


1659 See Broadridge, *supra* note 1656 at 2.

1660 See Vlastelica, *supra* note 1655.

1661 See Eaton Vance Comment Letter, *supra* note 1528 at 5.

1662 Rabener, *supra* note 1654.

1663 Id.

1664 see Nicolas Rabener, *ETFs: Smart Beta or Smart Marketing?* IPE MAGAZINE (April 2018), https://www.ipe.com/etfs-smart-beta-or-smart-marketing/10023929.article

1665 Id. (“growth and value tend to be negatively correlated, which implies that if value stocks show structural positive returns, then growth stocks are likely to generate negative excess returns over time.”)

1666 Id.

1667 See Broadridge, *supra* note 1656 at 7.
Similarly, “active” and “non-transparent” ETF structures, despite recent signs of popularity, present comparative challenges for investors when choosing between investment managers. Supporters of actively managed ETFs posit that they will improve market efficiency. In May 2019, the SEC provided exemptive relief, for the first time, for a “non-transparent” actively managed ETF. In November 2019 four more “non-transparent” ETFs were approved by the SEC with the requirement of disclosing a daily “proxy portfolio” to investors of underlying securities, but not basket weights. The justification for weighting opacity is that it facilitates competition and decreases the ability for firms to duplicate indexing strategies. Yet there are standing concerns about how non-transparent ETFs will affect markets, and doubts on the real benefits of “opaqueness.” As identified by SEC Commissioners Robert J. Jackson Jr. (as he was then) and Allison Herren Lee, if an AP doesn’t know an ETF’s precise underlying basket then arbitrage could be impaired, leading to investors buying or selling at prices that don’t reflect NAV in times of market turmoil.

iv. Part II, Compounding ETF Confusion? Disclosures and Investor Behavior

1674 Id.
1675 See Jackson Lee Statement, supra note 1672 at FN6.
In Part II, this article shows how investor cognitive limitations and behavioral tendencies around mandated investment disclosures compound the difficulty in ETF product comparisons and making suitable decisions.

a. The Limits of Investor Rationality and the Use of Decision-Making Shortcuts

Despite influential works asserting investor “rational expectations” and “efficient” markets, a variety of studies counter that investors are error prone, limited in their rational functioning, and subject to a wide range of decision-making biases and cognitive limitations when processing information. Studies of this nature look to test “judgmental processes” when investors assess information and make decisions. Mandated securities disclosure serves many worthy public policy goals. Yet the usefulness to investors of mandated


\[1678\] Slovic, supra note 1677 at 783.

\[1679\] Disclosure is both a fundamental and historical tool in securities regulation and provides an alternative to ex ante regulatory merit review or substantive approval of financial products or transactions. Disclosure serves many desired purposes including, among others, protecting investors, informing investors to make efficient decisions, allowing for efficient capital formation and price discovery, facilitating complete markets and the efficient distribution of risk, remedying informational asymmetries between securities issuers and investors, directing management incentives and corporate behavior, correcting agency problems, ensuring fair
Disclosure is (in part) contingent on their ability to accurately organize, synthesize and utilize information to make better decisions.1680 As famously described by Professor Herbert Simon, humans are rational only within the limits of their capacity to compute (a concept known as “bounded rationality”).1681 The complexity (and volume) of mandated securities disclosure in ETFs thus collides with the very human tendency to use decision making rules (known as “heuristics”) to simplify and de-complexify daily choices.1682

Securities regulators globally are assessing how to integrate learnings from behavioral finance and JDM research into investment disclosures.1683 Such initiatives aim to enhance market efficiency, and limit the “internalities” imposed on investors through their own poor decision making.1684 Heuristics are critical to navigate modernity, and for the most part they work tremendously well; yet, they can also lead to bad decisions when we are faced with complex variables or challenging tasks.1685 Judgment errors in processing information


1680 See Guttentag, Evolutionary Analysis, supra note 1679 at 974.
ONTARIO SECURITIES COMMISSION, Behavioral Insights Key Concepts, Applications and Regulatory Considerations, OSC STAFF NOTICE 11-778 (March 29, 2017),
have even been documented in the context of experts in their own domain. Further, even the most sophisticated institutional investors (which often hold ETFs in their portfolios) are prone to investor biases. Professor Elisabeth de Fontenay has identified how shareholder shortcomings affect even the most powerful and sophisticated investors thus revealing the “ideal investor” concept to be a myth.

Compounding the challenge of navigating complex investment disclosures is the fact that retail investors often lack financial literacy – an observation confirmed by the SEC. Research undertaken by the Investment Funds Institute of Canada reveals that how investors react to fee disclosure is also influenced by their investment knowledge and financial literacy. Professor Lisa Fairfax has extensively documented how widespread financial illiteracy in the U.S. poses “a significant, widespread, and long-term challenge to our current federal securities regime” since it uses disclosure (and assumes that investors both understand, and can effectively use it to make suitable decisions) as its primary investor protection tool. She notes financial illiteracy makes investors “ill-equipped” to avoid “inappropriate” investments, and this leads to market inefficiency. One finds ETF-related support for Fairfax’s thesis via investor interest in levered ETFs, which are a poor long-term investment due to a daily (or other periodic) “reset” feature. Fairfax contends

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1688 Choi & Pritchard, supra note 1677 at 17-20.
1692 See Lisa M. Fairfax, The Securities Law Implications of Financial Illiteracy, 104(6) VIRGINIA L. REV. 1065, 1070 (2018)(Fairfax notes at 1068-1069 that “[t]he founders of America’s federal securities law regime rejected other normative models that would have relied on regulatory evaluation of securities in favor of one focused on disclosure to investors.”)
1693 Id. at 1069.
that any “signaling function” allegedly performed by institutional investors, advisers and financial intermediaries to reliably offset the problems of retail investor financial illiteracy is inconsistent, potentially misaligned, and contestably assumes its own level of financial literacy.\textsuperscript{1695}

**b. Rational Choice Theory and Assumptions Underlying ETF Disclosures**

Underpinning securities regulation is an assumption that if investors are provided with prescribed disclosure they will make choices leading to efficient market outcomes.\textsuperscript{1696} A body of scholarship suggests otherwise.\textsuperscript{1697} It is not certain that all publicly disclosed information is incorporated into the price of securities upon dissemination.\textsuperscript{1698} There are numerous reports of markets failing to exploit arbitrage opportunities or respond to new information.\textsuperscript{1699} Further, even in the existence of arbitrage opportunities, those collectively recognizing them must possess both the capital, and willingness to act, in order to effectively “exploit the mispricing.”\textsuperscript{1700} Just because information is available does not mean that investors will make correct judgments about that information. Research has shown that investment decisions are also influenced by irrelevant information, social biases,\textsuperscript{1701} a discounted view of the future, and emotional states.\textsuperscript{1702} In order to make rational choices investors must fully understand their preferences,

\textsuperscript{1695} See Fairfax, \textit{supra} note 1692 at 1098-1100.
\textsuperscript{1696} See Gilson & Kraakman, \textit{supra} note 1677 at 549-52 & nn.1-5; Black, \textit{supra} note 1677 at 1499.
\textsuperscript{1700} Steven M. Davidoff & Claire A. Hill, \textit{Limits of Disclosure}, 36 SEATTLE U. L. REV. 599, 628 (2018); see Rule 6c-11 \textit{supra} note 11 at 175.
\textsuperscript{1702} See Ariely, \textit{supra} note 1685 at 317; Ontario Securities Commission, Behavioral Insights, \textit{supra} note 1683 at 25.
possess “computational” abilities to interpret relevant information, exhibit consistency in their choices, and utilize cognitive processes that are “fully logical” – and none of these premises are certain.1703

The rational actor assumption also disregards the propensity for investor “herds” to form.1704 Recent ETF reports from the CFA Institute have highlighted how the “systematic” risk factor in an ETF can “function as a coordinating device” or “focal point” for investors to form herds.1705 Others have noted growing evidence of ETFs as a “driver” of markets, with increasing price correlations between index constituent securities and amongst ETFs.1706 ETFs drive market events because high liquidity attracts short term speculators, who introduce non-fundamental noise into the price of underlying securities - a phenomenon witnessed in 2013 when trading in credit ETFs materially impacted the yield spreads on underlying bonds;1707 and in 2018 when inverse VIX fund trading may have generated an adverse “feedback loop” in the underlying VIX itself.1708

c. Information Overload and the Emerging ETF “Paradox of Choice”

ETFs present a prime case study for the dual cognitive frictions of “information overload” 1709 and the “paradox of choice.” 1710 Maximum information dissemination is not efficient if the costs of impaired decision-making outweigh marginal benefits.1711 The deleterious impact of “information

1703 Ontario Securities Commission, Behavioral Insights, supra note 1683 at 21.
1705 Bhattachaya & O’Hara, supra note 1460 at 6.
1707 Bhattachaya & O’Hara, supra note 1460 at 3; SEC Bond Subcommittee, supra note 1464 at 23-24.
1708 Bhattachaya & O’Hara, supra note 1460 at 4.
1709 Paredes, supra note 1679 at 421.
1711 See Frank H. Easterbrook & Daniel R. Fischel, Mandatory Disclosure and the Protection of Investors, 70 VA. L. REV. 669, 681, 969 (1984), see at 696 (“Information is costly, and the
overload” on investors has been well documented, as has the “limited attention” of consumers in general. Research has also shown that lengthy disclosures can be ineffective. A prospective ETF investor has an exhaustive (and largely unrealistic) plight attempting to navigate, for multiple comparative fund choices, cumulatively dense and voluminous ETF fact sheets, summary and full prospectus, SAI, and ongoing disclosures like semi-annual and annual reports to get a clear and comprehensive side-by-side picture.

Numerous psychological studies suggest that more information does not always lead to better judgment. In fact, too much information can impair judgment. More information can irrationally increase a decision maker’s confidence (even if it’s not justified by more accurate decisions). Lengthy disclosures also lead to

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1713 See Loewenstein, Sustein & Golman, supra note 1684 at 398-399.


1715 Consider the quandary faced by an investor who wants to compare ETF options in the emerging “artificial intelligence” (AI) sector. Industry aggregator ETF.com on July 3, 2020 listed twenty four available ETFs with exposure to the AI sector representing nearly $850M assets under management. See ETF.COM, Artificial Intelligence ETF Overview, https://www.etf.com/channels/artificial-intelligence-etsfs (accessed July 3, 2020). The total cumulative page count of all the disclosures noted above (fact sheet, summary prospectus, full prospectus, semi-annual report, and annual report) for a single AI-tracking ETF was 194 pages, see BLACKROCK, iShares Robotics and Artificial Intelligence Multisector ETF, https://www.ishares.com/us/products/297905/ishares-robotics-and-artificial-intelligence-multisector-etf-fund (accessed July 3, 2020). The idea that investors will navigate nearly two hundred pages of disclosure, respectively, for each of twenty-four individual ETFs to make a single investment decision is extremely unlikely.


1718 See Peter H. Huang, How Do Securities Laws Influence Affect, Happiness, & Trust? 3 J. BUS. & TECH. L. 257, 291 (2008) (“But people also can suffer affectively from information overload in terms of feeling anger, annoyance, apathy, boredom, frustration, helplessness, listlessness, and stress upon receipt of too much (or too little) information or information too quickly (or too slowly”); see at 292-293, (“Requiring provision of information can impose large negative affective psychic impacts, such as fear, guilt, or shame, without producing much in the form of any countervailing benefits.”)

1719 See Slovic, supra note 1677 at 783.
cognitive complexities associated with information “accumulation.” This is compounded by the difficulty in undertaking complex assessments which require analysis of numerous variables concomitantly. There is also evidence of investor “aversion” to disclosure that can make them uncomfortable (like conflict of interest disclosures).

Notably, investors do not always respond in ways predicted by regulators when they are given additional information, and this is compounded when one considers evidence of widespread financial illiteracy. After the 2008 crisis, the SEC instituted significant money market mutual fund reform, which among other measures increased the amount, and detail, of required information for underlying asset values, believing such measures would “increase market discipline, which could ultimately deter situations that could lead to heavy redemptions.” In a recent study, Professors Dan Awrey and Kathryn Judge suggest that these reforms may have actually reduced market discipline by “increasing the government footprint.” This iatrogenic backfire effect has significant relevance to ETF disclosure reforms in Rule 6c-11 below.

Relatedly, a “paradox of choice” has emerged in ETFs. In 2017 Bloomberg reported that the number of indexes had eclipsed the number of publicly traded stocks. Recent estimates from consulting firm ETFGI Global, notes that from 2008 to 2019 the number of available ETF products

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1720 See Ontario Securities Commission, Behavioral Insights, supra note 1683 at 24.
1721 See Simon, supra note 1677 at 99–100.
1723 Fairfax, supra note 1692 at 1088.
1725 Dan Awrey & Kathryn Judge, Why Financial Regulation Keeps Falling Short, CORNELL LAW SCHOOL LEGAL STUDIES RESEARCH PAPER NO. 20-03; EUROPEAN CORPORATE GOVERNANCE INSTITUTE (ECGI) LAW WORKING PAPER NO. 494/202; COLUMBIA LAW & ECONOMICS WORKING PAPER NO. 617 (2020), at 25, available at: https://scholarship.law.columbia.edu/faculty_scholarship/2604 ("[t]he net effect of the SEC’s reforms has thus far been to position the FHLBanks between banks and money market funds. Instead of raising capital by issuing short-term debt that was then, held by money market funds, banks today borrow more from FHLBanks, which then loan the money onto banks. Thus, rather than increasing market discipline, the reforms seem to have reduced it.")
1726 See infra Part III(a).
1727 See Schwartz, supra note 1710.
increased from 1617 to 6940 globally.\textsuperscript{1729} Despite this surge in product variety, the SEC justifies Rule 6c-11 on the economic premise that by reducing regulatory costs, and time to launch for new ETFs, that investors will be provided with more product choice.\textsuperscript{1730} Unfortunately, having “more choices” is not unequivocally a good thing.\textsuperscript{1731} There are many reasons why more choice in ETFs could be making investors worse off. First, too many investment choices can lead to confusion, even potential unhappiness (due to “missed opportunity” regret\textsuperscript{1732}), and “decision avoidance,”\textsuperscript{1733} leading to not investing at all (and risking wealth erosions from inflation).\textsuperscript{1734}

Too many ETF choices can also cause investors to inadvertently increase the risk profile of their portfolios by taking sector or geographic exposures (particularly in relation to thematic or “style” based ETFs\textsuperscript{1735}) without fully realizing it.\textsuperscript{1736} Too many choices can also lead to investors relying on a “default option” \textsuperscript{1737} which could potentially favor large and well known ETF incumbents.\textsuperscript{1738} Attempts to avoid decisions also strengthen demand for informationally opaque industry trends like ETF “model portfolios,” and suggested reforms to this industry are discussed below.\textsuperscript{1739} The windfall default to established firms because of choice aversion is supported by the “quality

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\textsuperscript{1729} See ETGFI, \textit{ETFGI report assets in the global ETFs and ETPs industry which will turn 30 years old in March started the new decade with a record 6.35 trillion US dollars} (January 16, 2020), https://etfgi.com/news/press-releases/2020/01/etfgi-reports-assets-global-etfs-and-etps-industry-which-will-turn-30


\textsuperscript{1731} See Schwartz, supra note 1710.

\textsuperscript{1732} See id. at 122-123 & 128.

\textsuperscript{1733} Id. at 130.

\textsuperscript{1734} See Constable, supra note 1419.

\textsuperscript{1735} A large number of ETFs have emerged that are based on “investment style” including (among many others), active, asset-allocation, alpha-seeking, carbon credit, developed markets, ESG, preferred stock, and socially responsible, see ETF.COM, \textit{Lists of ETFs}, https://www.etf.com/channels/ (accessed July 3, 2020).

\textsuperscript{1736} See Constable, supra note 1419.

\textsuperscript{1737} See Ontario Securities Commission, Behavioral Insights, supra note 1683 at 37.

\textsuperscript{1738} On this risk, there is empirical evidence to support the contention that the most well known mutual funds (based on media coverage) have benefited from increased fund flows, see Erik R. Sirri & Peter Tufano, \textit{Costly Search and Mutual Fund Flows}, 53 J. Fin. 1589, 1614-16 (1998).

\textsuperscript{1739} See infra, Part III(d).
heuristic,” in that some may imply that an ETF sponsor that is “well-known” is equated with “lower-risk.” Finally, choice overload can lead to “secondhand information” reliance rather than individual research, making investors susceptible to herding, or what Professor Barry Schwartz calls a “bandwagon effect,” or a “broad, but mistaken, consensus.” As noted, this is significant given the propensity for investor herds in ETFs.

d. ETF Relative Assessments and the Use of “Reference” Points

JDM research suggests that decision making is enhanced, particularly when assessing costs and benefits, if a suitable comparative is provided. As noted by Professors Daniel Kahneman and Amos Tversky in their seminal paper on “prospect theory” people evaluate the consequences of their choices from initial “reference points.” These are known as “anchors” and they can service as “an unintended reference point which influences subsequent value judgments.” Unfortunately, investors must undertake substantial efforts, with technical domain knowledge, to effectively compare ETFs where reference points or easy comparatives aren’t always obvious.

Rule 6c-11 mandates enhanced disclosure for ETFs on sponsor websites. Yet these enhanced disclosures do not require a standardized layout. The SEC acknowledged that “[i]nvestors seeking to compare multiple ETFs will have to visit the website of every ETF, navigate to the relevant section of the website, and extract the information provided in the layout chosen by the fund.” This could have the ultimate effect of decreasing, if not significantly undermining, the “informational benefits of the new disclosures” - a point explicitly conceded by the SEC. While the SEC’s hope that competition

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1741 See Schwartz, supra note 1710 at 61.
1742 Bhattachaya & O’Hara, supra note 1460 at 4.
1743 See Ariely, supra note 1685 at 20.
1744 See Kahneman & Tversky, Prospect Theory, supra note 1682 at 274, 286.
1745 See Ontario Securities Commission, Behavioral Insights, supra note 1683 at 33.
1746 See infra Part III(a).
1747 See Rule 6c-11, supra note 1424 at 187 (“the conditions standardize content requirements to facilitate investor analysis while allowing ETFs to select a layout for displaying the required information that the individual ETF finds most efficient and appropriate for its website.”)
1748 Id.
1749 Id.
amongst “third party service providers” will ease the cost of comparative assessments for investors,¹⁷⁵⁰ these (if available) will likely exist behind expensive commercial pay walls and be inaccessible to many investors.

Also, when ETF investors attempt to compare products there is a potential for a disproportionate windfall in investment assets to flow to the largest ETF firms because of a concept called “overreliance on salience.”¹⁷⁵¹ This could create a bias for “brand names” as “perceptions of quality based on the brand’s profile” rather than investors looking into the specific details and factors associated with a particular fund.¹⁷⁵² Salience could also be generated by the steady media mention of the largest ETF firms – particularly BlackRock in light of its growing influence within the U.S. government in facilitating coronavirus stimulus.¹⁷⁵³ This concept is supported by empirical evidence that the largest ETF firms are in fact capturing the bulk of new investment flows.¹⁷⁵⁴

e. “Processability” and the Importance of Context in Information Delivery

Information disclosure can increase competition, improve product quality, alter consumer behavior, and aid in better decision making if it is used correctly.¹⁷⁵⁵ Information will only be used correctly if it is effectively processed.¹⁷⁵⁶ Professors James Cox and John Payne define processability as “the cognitive ease with which information can be comprehended and used” and state that it is a “function of the way the information is presented, the kind of processing to be undertaken, and the knowledge base of the consumer.”¹⁷⁵⁷ Not

¹⁷⁵⁰ Id.
¹⁷⁵¹ See Ontario Securities Commission, Behavioral Insights, supra note 1683 at 33.
¹⁷⁵² Id. at 21.
¹⁷⁵⁴ See Bebchuk and Hirst, The Specter, supra note 1435 at 723 (“Over the last decade, more than 80% of all assets flowing into investment funds has gone to the Big Three, and the proportion of total funds flowing to the Big Three has been rising through the second half of the decade.”)
¹⁷⁵⁷ Cox & Payne, supra note 1637 at 931.
all information that is available will be readily processible, and information will be more effectively processed if it is delivered with adequate context. Effective “context” (also called “framing effects”) may also require particularly wording in disclosures. Professors Cox and Payne also note, impactful information must be “easy to process,” and since processing is “costly” it is common for consumers to “accept information in the format in which it is given rather than expending cognitive effort to transform it.” Context is also needed for “common or familiar attributes” among competing choices.

Rule 6c-11 made several improvements to contextual disclosure including enhanced website disclosures of key ETF variables, visuals and tables illustrating trading discounts and premiums, contextual discussions around periods of prolonged trading price dislocations from NAV, and contextual disclosures relating to bid-ask spreads. Yet there is more that can be done to enhance investor context, improve processability, and allow for simplified product comparisons. Part III will canvass many such ideas including standardized calculation methods and website layout formats, the use of digital enhancements, centralized reporting of key ETF variables in standardized digital formats; and enhanced contextual disclosures around index construction methodology and variability and AP arbitrage instability.

f. ETF Disclosure Ordering and the “Primacy” and “Recency” Principles

A variety of psychological studies have revealed that information identified at the beginning (the “primacy effect”), and the end (the “recency

1761 Cox & Payne, supra note 1637 at 932.
1762 Id. at 934; Slovic, Finucane, Peters & MacGregor, supra note 1759 at 334.
1763 See infra Part III(a); see Rule 6c-11, supra note 1424 at 243-249.
1764 See infra Part III (b)-(g).
effect"\textsuperscript{1766}, of a document is more likely to be recalled than information contained in the middle.\textsuperscript{1767} This concept was originally coined the “serial position effect” and it’s been used in technology to understand internet use habits,\textsuperscript{1768} in advertising to influence behavior,\textsuperscript{1769} and generally to enhance user experience across various domains including digital arts, interface and web design.\textsuperscript{1770}

The serial position effect can contribute to investor confusion when one assesses ETF website disclosures. As noted, Rule 6c-11 mandates enhanced website disclosures, but allows for discretion in the layout and presentation method of required variables.\textsuperscript{1771} Consider an ETF investor wanting exposure to a basket of assets that tracks U.S. real estate investments. In addition to a conundrum of product choice \textit{ex ante},\textsuperscript{1772} our investor encounters significant heterogeneity in information presentation formats when looking across ten different ETF issuers (\textit{Vanguard, Schwab, State Street Global Advisors, BlackRock, JP Morgan, Fidelity, Pacer, Invesco, First Trust and Vident}).\textsuperscript{1773}

\textsuperscript{1766} See \textsc{American Psychological Association, Recency Effect}, https://dictionary.apa.org/recency-effect (last accessed July 4, 2020).


\textsuperscript{1771} See Rule 6c-11, \textit{supra} note 1424 at 187.

\textsuperscript{1772} On July 4th, 2020, according to industry aggregator ETF.com there were 22 real estate ETFs trading in the U.S., see ETF.com, \textit{Equity: U.S. Real Estate}, https://www.etf.com/Equity_U_S_Real_Estate (accessed July 4, 2020).

Given this overwhelming layout non-uniformity, one wonders what initial or “recent” information is actually being retained by a diligent investor other than the obvious, immediately noticeable markers (like trading price, NAV or expense ratio), which are far from the whole story about an ETF.  

**g. ETF Attribute “Evaluability” and Subjective Factor Weighting**

An ETF investor is tasked with comparing multiple fund attributes for each evaluated fund. A JDM concept called the “evaluability hypothesis” (EH) has significant implications for how investors interpret and make decisions around comparable ETF investment products. Professor Christopher Hsee defines the EH as, “[w]hen two stimulus options involve a trade-off between a hard-to-evaluate attribute and an easy-to-evaluate attribute, the hard-to-evaluate attribute has a lesser impact in separate evaluation than in joint evaluation, and the easy-to-evaluate attribute has a greater impact.” A “hard to evaluate” attribute is one where “the evaluator does not know how good a given value on the attribute is without comparisons.” An “easy to evaluate” attribute is one that can independently ascertained. Hsee demonstrated the EH across a variety of studies including employer decisions in hiring computer programmers, and consumer preferences for TVs and compact disk players. He found that when evaluating options separately, evaluators “base their evaluation chiefly on the easy-to-evaluate attribute alone,” while in a joint


1774 See supra Part I; see Johnson, supra note 1457.
1775 See Hsee, supra note 1759.
1776 Id. at 250.
1777 Id. at 249.
1778 Id.
1779 Id. at 251-254. The results from Hsee’s EH study are consistent with similar findings in judgment decision making. See M.H. Bazerman, G.F. Loewenstein, S.B. White, Reversals of preference in allocation decisions: Judging an alternative versus choosing among alternatives, 37 ADMINISTRATIVE SCIENCE QUARTERLY 220 (1992).
1780 Hsee supra note 1759 at 249.
comparison evaluators can compare hard to evaluate attributes against each other.\textsuperscript{1781}

A key implication of Hsee’s study for ETFs is that “hard to evaluate” attributes (like hidden fees, securities lending, custom baskets, tracking error, NAV calculation methods, premiums and discounts, and index composition methodology) are most effectively assessed in a comparative format.\textsuperscript{1782} However, as this article has demonstrated, due to wide ETF issuer discretion in calculating NAV and IIV, index replication and composition processes, operational, management and marketing practices, naming conventions, and website layouts, true product comparisons are extremely difficult (perhaps even impossible). If an investor evaluates an ETF individually (or “separately”), then according to Hsee, “because people do not know how to evaluate an option’s value on the hard-to-evaluate attribute, they have to base their evaluation chiefly on the easy-to-evaluate attribution alone.”\textsuperscript{1783}

As this article has shown, however, an easy to evaluate attribute (like expense ratio or performance) does not paint a complete picture. Therefore, a centralized, standardized reporting mechanism and data repository, allowing for true comparatives amongst similar ETFs, and made available to all investors free of charge, would seem prudent.\textsuperscript{1784} This would aid in assessing “hard to evaluate” criteria. A centralized and standardized reporting mechanism, when combined with a uniform website layout format would also help remedy a related challenge that when an ETF investor chooses between products they will subjectively weight fund attributes – a phenomenon that has been described as an “error in self-insight.”\textsuperscript{1785}

h. Is a Dollar Always a Dollar? Assessing Direct Versus Indirect ETF Fees

\textsuperscript{1781} \textit{Id} at 250 (“In joint evaluation, people could compare one option against the other, and this comparison would increase the evaluability of the otherwise hard-to-evaluate option.”)

\textsuperscript{1782} \textit{Id.} at 256.

\textsuperscript{1783} Hsee supra note 1759 at 249.

\textsuperscript{1784} See Comment Letter to SEC of Morningstar on File No. S7-15-18 (October 1, 2018), at 1-2, available at https://www.sec.gov/comments/s7-15-18/s71518-4460574-175789.pdf (“Morningstar Comment Letter”) (“We strongly encourage the Commission to have the information filed in a standardized format into a public database, such as EDGAR, through which fund sponsors will provide the information about their products.”)

\textsuperscript{1785} See Slovic, supra note 1677 at 787.
Finally, not all ETF expenses affect investors emotionally in the same way, and direct fees may feel more significant than “indirect” costs. The Ontario Securities Commission (OSC) in a study on how behavioral insights could be used to improve investment fee disclosures notes, “[i]nvestors may experience less pain of payment for indirect charges than they do for direct charges.” Thus opaque or hidden, but still potentially material, indirect expenses incurred from holding ETFs, like tracking errors, or transacting at a price premium or discount to NAV, may not be given as much attention by investors than transparent direct fees like expense ratios. Also, because of a phenomenon commonly known as the “peanut effect,” small fees are discounted when assessed year over year, despite having a significant compounding impact. This effect is exacerbated by a phenomenon known as “hyperbolic discounting” where long-term impacts are less focused on than near term-effects. ETF tracking error has the potential to massively erode investor returns, but it might be discounted given its long-term impact. Another relevant phenomenon is the “zero price effect,” where people feel excitement around free products, and this can lead to bad decisions. ETF’s marketed as “no-fee” might be capitalizing on this effect, despite having expenses associated with underlying assets.

v. Part III, How ETF Investor Performance Comparisons Can Be Improved

In Part III, this article summarizes improvements in ETF comparisons made by Rule 6c-11. It gives recommendations for additional enhancements using two key concepts: standardization and central reporting. Investors would widely benefit from standardized website formats and layouts, uniform calculation methodologies of key ETF variables (like NAV and IIV), and

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1787 See Ontario Securities Commission, Improving Fee Disclosure, supra note 1683 at 16.
1788 See supra Part I(a)(iii).
1789 See supra Part I(a)(ii) & Part I(b)(iv).
1790 See Ontario Securities Commission, Improving Fee Disclosure, supra note 1683 at 18-19.
1791 Id. at 19; see D. Laibson, Golden Eggs and Hyperbolic Discounting, 112(2) THE QUARTERLY JOURNAL OF ECONOMICS 443 (1997).
1793 See Bryan Borzykowski, Are no-fee ETFs really free? MONEYSENSE (September 4, 2018), https://www.moneysense.ca/save/are-no-fee-etfs-really-free/ (detailing how some ETFs that are marketed as “no-fee” still have expenses associated with the underlying assets that affect returns).
industry standard ETF nomenclature. Also, structured electronic reporting by ETF sponsors of standardized data to a centrally controlled public repository would also greatly enhance comparative assessments. Investors would also benefit from strategic ordering, digitally enhanced disclosure, and contextual discussion around critical concepts like AP arbitrage and index composition methodology. Part III concludes by calling for specific reform in the ETF “model-portfolio” industry.

a. SEC Disclosure Amendments That Facilitate ETF Performance Comparatives

The SEC has taken significant steps since the 2008 crisis to improve the effectiveness of disclosures, and aid investor comprehension through “plain language” guidelines. Rule 6c-11 makes several disclosure amendments, many of which help investors compare ETFs falling within the scope of the rule. First, it requires ETF sponsors to disclose on their website NAV per share, market prices, median bid-ask spreads over the most recent thirty calendar days, and premiums and discounts at the end of each prior business day. It also requires table and line graphs for days where ETFs trade at a premium or

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1796 Rule 6c-11 does not apply to all ETF structures, but rather is limited in its application to ETFs organized as open-end funds. It leaves in place the individual exemptive relief framework for several product types including leveraged, inverse, ETFs organized as Unit Investment Trusts (UITs), share class ETFs, and non-transparent structures, see Rule 6c-11, supra note 1424 at 17-33. ETFs are also subject to exchange listing requirements see Rule 6c-11, supra note 1424 at 26; Hu & Morley 2, supra note 1459 at 1156; Some ETF stakeholders advocated unsuccessfully for Rule 6c-11 to also include ETF products that use leverage to provide a multiple of exposure, or derivatives to provide inverse exposure to a specified index, see Comment Letter to SEC of ProShares Advisors LLC on File No. S7-15-18 (October 1, 2018), available at https://www.sec.gov/comments/s7-15-18/s71518-4488848-175924.pdf (“ProShares Comment Letter”); Comment Letter to SEC of Angela Brickl, General Counsel, Rafferty Asset Management, Inc. on File No. S7-15-18 (October 1, 2018), available at https://www.sec.gov/comments/s7-15-18/s71518-4467064-175845.pdf (“Direxion Comment Letter”).

1797 Rule 6c-11 supra note 1424 at 97, 235-236.
discount to their NAV, along with commentary on material factors contributing to prolonged dislocations. A table and line graph can help illustrate complex issues (like arbitrage instability); although some commenters suggested that requiring both was unnecessary, and there was disagreement on the preferred format. The SEC justified the inclusion of both as providing different information (the line graph measured “degree” of deviation, and the table showed “how often” it occurred). There was some contention whether ETF premium and discount disclosure added to investor confusion - for example whether a discount could be misinterpreted by an investor as a “bargain” rather than a source of instability. Also, it is uncertain the extent an ETF sponsor can precisely determine the material factors contributing NAV dislocation in its commentaries.

Rule 6c-11 no longer requires an ETF sponsor to provide intraday estimates of its NAV per share (a metric commonly referred to as “intraday indicative value” or “IIV”). Prior exemptive orders required the dissemination of IIV, as it was considered useful for investors to determine whether an ETF was trading at a premium or a discount. The IIV requirement was jettisoned from Rule 6c-11 because the SEC was concerned about its accuracy, and how it could be misleading or confusing to investors if an ETF was comprised of less liquid assets (like bonds) or foreign securities. At the

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1798 Id. at 100-101, 235.
1799 See id. at 97; see at 248 (“If the exchange-traded fund’s premium or discount is greater than 2% for more than seven consecutive trading days, a statement that the exchange-traded fund’s premium or discount, as applicable, was greater than 2% and a discussion of the factors that are reasonably believed to have materially contributed to the premium or discount, which must be maintained on the website for at least one year thereafter.”)
1801 Rule 6c-11 supra note 1424 at 101.
1802 Id. at 98; See Comment Letter to SEC of State Street Global Advisors on File No. S7-15-18 (October 1, 2018), at 11, available at https://www.sec.gov/comments/s7-15-18/s71518-4466054-175827.pdf (“SSGA Comment Letter I”) supra note 1801 (identifying that market makers and intermediaries can effect arbitrage without the IIV given “widely available daily portfolio holdings”, and that the IIV has “significant
time of the adopting release of Rule 6c-11, exchange listing requirements mandated IIV dissemination, and there was industry support for the SEC to work with the exchanges to remove this requirement.\textsuperscript{1807} Fortuitously for ETF sponsors, shortly after the adoption of Rule 6c-11, the major U.S. exchanges proposed new generic listing standards removing the IIV publication requirement for ETFs that can rely on Rule 6c-11, and these rule changes were adopted by the SEC.\textsuperscript{1808} The SEC acknowledged that the IIV didn’t have a standardized calculation methodology, and that the metric was not widely used by market makers and APs when performing arbitrage (who generally used proprietary methods).\textsuperscript{1809}

The choice to eliminate intraday IIV was controversial, as many consider IIV to be useful to retail investors.\textsuperscript{1810} One commenter to Rule 6c-11 expressed stark cynicism at its removal, implying that opacity clearly favored the ETF industry over investors.\textsuperscript{1811} Nasdaq suggested that providing IIV allows an


\textsuperscript{1807} See Invesco Comment Letter, supra note 1425 at 13; SIFMA Comment Letter, supra note 1425 at 20; Wisdom Tree Comment Letter, supra note 1800 at 2, 4-5; SSGA Comment Letter I, supra note 1802 at 7; ETF.com Comment Letter, supra note 1545.


\textsuperscript{1809} Rule 6c-11 supra note 1424 at 62-63 (“[b]ecause there are no uniform methodology requirements, the IIV also can be calculated in different and potentially inconsistent ways.”)


\textsuperscript{1811} See Segment Letter, supra note 397 (“Reducing intra-day NAV calculations will limit investor information flow and will result in less efficient daily pricing. I believe that 99%
investor to “screen” for price deviations that signal arbitrage instability. Others noted that IIV may be the only intraday pricing mechanism that is available to retail investors, and the only intraday way to know if an ETF is trading a significant premium or discount to NAV. The SEC, in the final rule, admitted that none of the largest ETFs by assets provided real-time IIV on their websites, and the information wasn’t otherwise available on free public financial websites.

The SEC Fixed Income Market Structure Advisory Committee (FIMSAC) suggested that IIV contained “valuable information” for retail investors, and echoed that it’s the only intra-day pricing source for many investors, so it should be included with an explanation of its limitations. Also, recent empirical studies suggest that the potential for investor herding increases if IIV is not available. Investors also benefit from knowing when prices deviate from NAV during the trading day since, unlike mutual funds, they cannot redeem directly at NAV. As documented by Professors Hu and Morley, the possibility of buying an ETF at a premium to NAV (or selling at a discount) throughout the day is a viable concern for investors. Also, IIV is valuable when a significant gap materializes during the day but is corrected by close, which as noted by Professors Hu and Morley happened in 2015 with BlackRock’s iShares Core S&P 500 (IVV).

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accurate information is better than no information at all. In this case, it’s more like 99.99%. We both understand who benefits from reduced information…….Please do not let industry forces success in reducing great information in pursuit of perfect information.”

1812 See Nasdaq Comment Letter, supra note 1810 at 7.
1813 See IDS Comment Letter, supra note 1810 at 2-3; Eaton Vance Comment Letter, supra note 1528 at 3; NYSE Comment Letter, supra note 1810 at 4.
1814 See Angel Comment Letter, supra note 1615 at 3
1815 See Rule 6c-11 supra note 1424 at 66.
1817 Bhattacharya & O’Hara, supra note 1460 at 15.
1818 See Hu & Morley 2, supra note 1459 at 1162, 1174.
1819 Id. at 1174.
1820 Id. at 1174-1175; Relatedly, one law firm commenter to Rule 6c-11 suggested that additional disclosure should be required for “material discount spreads that are obscured by using pricing only at the close of the day” see Comment Letter to SEC of Hagens Berman on File No. S7-15-18 (October 10, 2018), at 2, 7-8 available at https://www.sec.gov/comments/s7-15-18/s71518-4463571-175822.pdf (“Hagens Berman Comment Letter”).
The SEC requires ETF sponsors to report if they are relying on Rule 6c-11.\textsuperscript{1821} It also amended Form N-1A in several respects to make cost disclosures more transparent, and easier to understand for ETF investors.\textsuperscript{1822} Form N-1A is the registration statement form used by open-ended funds to register under the ICA and offer securities in the U.S.\textsuperscript{1823} It provides ETF investors with information about ETF trading and other costs.\textsuperscript{1824} ETFs relying on Rule 6c-11 must now provide additional disclosure around actual trading costs when investors buy and sell ETF shares.\textsuperscript{1825} The SEC did pull back from its original proposal of an extensive and prescribed “question and answer” (Q&A) format despite some industry support.\textsuperscript{1826} Instead, it landed on a flexible approach for ETF sponsors to use other formats besides Q&A to communicate trading costs in Item 6 of Form N-1A.\textsuperscript{1827}

Form N-1A was also amended, for ETF issuers that rely on Rule 6c-11, to require a cross referencing of an ETF’s website (which includes timely and enhanced disclosures) in its summary prospectus,\textsuperscript{1828} a streamlined obligation to provide “narrative disclosures” in relation to bid-ask spreads to better contextualize costs in context,\textsuperscript{1829} and daily website disclosure of “median bid-ask spreads calculated over the most recent 30-day period.”\textsuperscript{1830} The latter requirement was criticized as being potentially misleading (since it’s only one aspect of trading costs).\textsuperscript{1831} Rule 6c-11 also removed certain disclosures from

\begin{enumerate}
\item Rule 6c-11 \textit{supra} note 1424 at 147.
\item See \textit{id.} at 133-134 (changes include, among others, adding the term “selling” to narrative disclosures for fees to reflect the fact that fees may be incurred when they sell an ETF and a requirement that investors may be subject to brokerage commissions and other fees; streamlining disclosures related to trading costs and bid-ask spreads; and requiring ETF issuer that can’t rely on Rule 6c-11 to provide median bid-ask spread information on their website).
\item See Rule 6c-11 \textit{supra} note 1424 at 133.
\item \textit{Id.} 136-137.
\item See Oppenheimer Funds Comment Letter, \textit{supra} note 1531 at 4.
\item Rule 6c-11 \textit{supra} note 11 at 137.
\item \textit{Id.} 138 (“Rule 6c-11 will require daily website disclosure of several items, including the NAV per share, market price, premium or discount, and bid-ask spread information.”)
\item See Rule 6c-11, \textit{supra} note 1424 at 109.
\end{enumerate}
Form N-1A, including duplicative information that is provided in Form N-CEN. Form N-CEN provides information to the SEC on an annual basis from ETF issuers, similar to a census. Form N-8B-2 was also amended to make it consistent with revisions to Form N-1A (requiring ETFs organized as UITs to provide the same disclosures as ETFs registered under the ICA) despite UITs not falling within the ambit of Rule 6c-11.

Also for consistency across regulations, and to reduce regulatory complexity in ETFs, a series of “technical and conforming amendments” were made to Form N-CSR, Form N-PORT, and Regulation S-X. Rule 6c-11 avoided imposing “supplemental disclosures” if, within limited allowable and extraordinary circumstances, an ETF suspended the issuance of creation units. An idea to create greater transparency for investors, which was not included in Rule 6c-11 however, was the proposal by Jane Street Capital, LLC, a leading ETF market maker, to require ETFs to file periodic reports, like on Form 8-K, for material non-public information that is relevant to the operation of the arbitrage function, like the potential for “creation halts.”

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1832 Rule 6c-11 supra note 1424 at 144.
1834 See Rule 6c-11 supra note 1424 at 145-146.
1835 See U.S. SEC. & EXCH. COMM’N, Form N-CSR, https://www.sec.gov/files/formn-csr.pdf (Form N-CSR is a “Certified Shareholder Report of Registered Management Investment Companies” and is “used by management investment companies to file reports with the Commission” relating to a variety of disclosure items of ETFs organized as registered management investment companies.)
1836 See U.S. SEC. & EXCH. COMM’N, Form N-Port, https://www.sec.gov/files/formn-port.pdf (Form N-PORT is a “Monthly Portfolio Investments Report” and is used by registered management investment companies or ETFs organized as UITs to file monthly portfolio holdings with the Commission.)
1838 See Rule 6c-11 supra note 1424 at 59; See Eaton Vance Comment Letter, supra note 1528 at 3; Jane Street Comment Letter, supra note 1469 at 2-3.
1839 See Jane Street Comment Letter, supra note 1469 at 2-3. Jane Street notes that this is required by some exchanges and advocates for a consistent approach by the SEC; see Listed ETP Compliance Guidance, NYSE REGULATION, (January 10, 2018), at 5, available at https://www.nyse.com/publicdocs/nyse/regulation/nyse-arca/NYSE_Arca_2018_Regulatory_Reminder_Letter.pdf.
b. Enhancing Comparative Disclosures and Standardized Calculation Methodologies

Easy investor comparisons allow for a well-functioning and efficient market, and JDM research suggests that decision making is made “more coherent and rational” when information is presented in a comparative format.\textsuperscript{1840} Unfortunately ETF issuers do not have a market incentive to facilitate simple ETF comparisons since doing makes it easier for investors to “switch” to competitor firms.\textsuperscript{1841} Performance comparisons in ETFs are enhanced when disclosures are standardized; and Rule 6c-11 mandates standardization in the dissemination of daily ETF portfolio holdings,\textsuperscript{1842} a move which garnered significant industry support.\textsuperscript{1843}

The SEC’s predecessor rule to 6c-11 relied on Article 12 of Regulation S-X for information presentation, and this was strongly contested by market participants as a source of investor confusion.\textsuperscript{1844} Rule 6c-11 requires an ETF to disclose its portfolio (on its website free of charge) including ticker symbol, CUSIP or other identifying information; a description of the ETF’s underlying holdings,\textsuperscript{1845} quantities of securities held, and percentage weights of the portfolio.\textsuperscript{1846} The SEC rejected, however, the idea of adjusting disclosures in alignment with other investment products.\textsuperscript{1847} It also disallowed its utilization by

\textsuperscript{1840} Loewenstein, Sunstein & Golman, supra note 1684 at 406.

\textsuperscript{1841} See Jeff Schwartz, Reconceptualizing Investment Management Regulation, 16 GEO. MASON L. REV. 521, 541 (2009) (illustrating the propensity for switching in the mutual fund industry).

\textsuperscript{1842} See Rule 6c-11, supra note 1424 at 74-75.

\textsuperscript{1843} Cary Comment Letter supra note 1545; ETF.com Comment Letter supra note 1545; BlackRock Comment Letter, supra note 1451 at 2; BNY Mellon Comment Letter, supra note 1545 at 1-2; Fidelity Comment Letter, supra note 1545 at 3; Comment Letter to SEC of ETF BILD Project on File No. S7-15-18 (October 1, 2018), at 4, available at https://www.sec.gov/comments/s7-15-18/s71518-4467044-175799.pdf (“ETF BILD Letter”)

\textsuperscript{1844} See Franklin Comment Letter, supra note 1831 at 2-3; Fidelity Comment Letter, supra note 1545 at 3, 9-10; BlackRock Comment Letter, supra note 1451 at 14; Comment Letter to SEC of Vanguard on File No. S7-15-18 (September 28, 2019) at 4, available at https://www.sec.gov/comments/s7-15-18/s71518-4457959-175784.pdf (“Vanguard Comment Letter”); CSIM Comment Letter, supra note 1545 at 9; Wisdom Tree Comment Letter, supra note 1800 at 8.

\textsuperscript{1845} The SEC also indicated specific requirements for description of fixed income assets including “the security’s name, maturity date, coupon rate, and effective date, where applicable, to assist investors in identifying the specific security held.” See Rule 6c-11, supra note 1424 at 77.

\textsuperscript{1846} See Rule 6c-11, supra note 1424 at 76-77

\textsuperscript{1847} See id. at 75-76; see Wisdom Tree Comment Letter, supra note 1800 at 7-10 (limiting disclosures to “information that is useful to investors”). See also CSIM Comment Letter, supra
share class ETFs, despite some industry support for all ETF sponsors being brought under a similar approval framework.

Rule 6c-11 mandates the standardized publication of ETF portfolio holdings, yet reserves a wide array of discretion in the format and “layout for displaying the required information.” A structured layout was not required under the new rule, despite having significant industry support for a standardized approach. Given layout discretion, the SEC openly acknowledged that “an investor’s ability to efficiently extract information from website disclosures for purposes of aggregation, comparison, and analysis across multiple ETFs and time periods may be limited.” Further, third-party aggregation services are costly for investors, who must otherwise engage in a cumbersome process of reviewing each ETF website.

The SEC conceded that having to visit each website could “decrease the information benefits of the new disclosures.” Standardized website layouts could incorporate learnings from behavioral studies which show that internet consumers often don’t make careful assessments in their online viewing (we substitute “depth for speed”). Thus, the JDM principles of prominence and disclosure ordering, including varied screen designs for mobile and desktop viewing platforms, are important to consider in designing a standardized layout and should be further studied.

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note 1545 at 9 (recommending disclosures “similar to what money market funds report on fund websites today.”).
1848 Rule 6c-11, supra note 1424 at 121-124.
1849 See ETF.com Comment Letter, supra note 1545; BNY Mellon Comment Letter supra note 1545 at 1; Oppenheimer Funds Comment Letter, supra note 1531 at 6.
1850 Rule 6c-11, supra note 1424 at 187.
1851 See id. at 187, 205.
1852 See Cary Comment Letter, supra note 1545; Morningstar Comment Letter, supra note 1784 at 1 (“We believe that this information should be provided in a standardized, structured format, such as XBRL, so that it can be analyzed and compared across providers. While website and prospectus disclosures are helpful, we believe that they are too cumbersome for analysis and easy comparison”); Angel Comment Letter, supra note 1615; Eaton Vance Comment Letter, supra note 1528 at 4; SSGA Comment Letter I, supra note 1802 at 2,9; ETF BILD Letter, supra note 1843 at 4.
1853 Rule 6c-11, supra note 1424 at 187.
1854 Id.
1855 Ontario Securities Commission, Behavioral Insights supra note 1683 at 41.
1856 Id. at 41-43.
1857 See supra Part II(f).
Additionally, ETF firms do not have market incentives to study the most effective means of website presentation for investors, since they can be easily copied by other firms. One scholar has called this a “collective active problem” for investment managers to devise an “optimal layout” on their own. The SEC can remedy this problem, while enhancing comparability and democratizing access, if website disclosure formats are standardized, and ETF key data was filed in a structured and consistent format, and made publicly available through a central database or repository in an optimal structure determined by the regulator that allowed for ETF side-by-side comparison. Regrettably, the SEC rejected an EDGAR-style filing requirement in Rule 6c-11 for portfolio holding information, despite support from prominent industry stakeholder Morningstar, as well as FIMSAC, citing increased costs on ETF sponsors.

Knowing how an ETF attribute compares with similar products is critical for investors when making an “informed choice.” Disclosures made available through firm websites and prospectus are both “cumbersome” and impede easy analysis and comparability. Requiring ETF disclosures to be made available in a “centralized repository in a structured format” (like EDGAR) would have significant benefits for investors including the ability to retain information if it was removed from an ETF sponsor’s website. It would also be “machine readable,” and could be tagged for easier automated aggregation and comparative analysis by software programs. It would also allow for easier investor comparative assessments of matters such as portfolio holdings without

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1858 See Schwartz, supra note 1841 at 541-542.
1859 Id.
1860 See Morningstar Comment Letter, supra note 1784 at 1.
1861 Id. 1-2 (“We strongly encourage the Commission to have the information filed in a standardized format into a public database, such as EDGAR, through which fund sponsors will provide the information about their products.”)
1862 See FIMSAC Comment Letter, supra note 1816 at 5 (“We support the idea of requiring information on NAV, market price, and range of premium/discount be readily available to investors. While posting on each ETF’s website is helpful, a centralized database (potentially EDGAR) accessible free of charge would be ideal to access this valuable data.”)
1863 Rule 6c-11 supra note 11 at 78
1864 See Cox & Payne, supra note 1637 at 136.
1865 See Morningstar Comment Letter, supra note 1784 at 1.
1866 Rule 6c-11 supra note 1424 at 206-207; see Reagan Comment Letter, supra note 1545; ETF BILD Letter supra note 1843 at 4 (“it makes more sense for there to be a single industry source where collecting, housing and disseminating such information occurs.”)
1867 Rule 6c-11 supra note 1424 at 205-207; see FIMSAC Comment Letter, supra note 1816 at 5; Morningstar Comment Letter, supra note 1784 at 1-2; Eaton Vance Comment Letter, supra note 1528 at 4.
having to individually navigate potentially hundreds of different websites (which use different presentation formats.) 1868

As an interim step to a centralized database, the SEC could require ETF firms to provide a comparison in their existing disclosures on how certain fund elements (like tracking error or securities lending profits) compare to related ETFs, similar to comparative proposals in mutual fund disclosure. 1869 A centralized source of information, however, that utilizes a regtech solution like blockchain, or partners with a fintech innovator, would have significant cost savings for small and medium sized ETFs, efficiency payoffs for APs, and substantial benefits for retail investors who would no longer have to visit individual websites to obtain comparative metrics. 1870

Another area where further standardization is warranted is in the calculation of NAV (including IIV). IIV standardization was not required by Rule 6c-11, 1871 despite support from numerous market participants including major exchanges like the NYSE Arca, Nasdaq and Intercontinental Exchange, Inc. (ICE). 1872 At the time of the adopting release of Rule 6c-11, exchange listing rules required ETFs to make IIV available; although this requirement has since been jettisoned by the major U.S. exchanges for ETFs relying on Rule 6c-11. 1873 Nevertheless, a standardized calculation methodology would still aid investors

1868 See ETF BILD Letter, supra note 1843 at 4 (“Currently over 100 advisers to ETFs post on their website ETF basket information. While Form N-1A imposes certain requirements on how such disclosure is made, ETFs vary on how such information is presented, which sometimes making it difficult for website visitors to find such information.”)

1869 See Schwartz, supra note 1841 at 570 (proposing such a comparative disclosure requirement for mutual fund fees); Christine Sgarlata Chung, The Devil You Know: A Survey Examining How Retail Investors Seek Out & Use Financial Information and Investment Advice, 37 REV. BANKING & FIN. L. 653, 750 (2018) (setting out numerous recommendations on how mutual fund disclosure could be improved for easier fee comparisons across different funds).

1870 See ETF BILD Letter, supra note 1843 at 4.

1871 See Rule 6c-11, supra note 1424 at 64-66.

1872 See NYSE Comment Letter, supra note 1810 at 3; IDS Comment Letter, supra note 1810 at 2; Nasdaq Comment Letter, supra note 1810 at 7; Eaton Vance Comment Letter, supra note 1528 at 4; Angel Comment Letter, supra note 1615.

1873 See Shea et al, supra note 1808. This change was supported by numerous commenters to Rule 6c-11, see Comment Letter to SEC of the Subcommittee on Investment Companies and Investment Advisors of the Committee on Federal Regulation of Securities of the Section of Business Law of the American Bar Association on File No. S7-15-18 (October 11, 2018), at 4, available at https://www.sec.gov/comments/s7-15-18/s71518-4510948-175993.pdf (“ABA Comment Letter”). The CBOE in its comment letter noted that it intended to “file a proposal to eliminate the IIV dissemination requirement within its ETF listing requirements when the daily portfolio holding disclosure requirement is in place” see CBOE Comment Letter, supra note 1545 at 3;
when comparing products.\textsuperscript{1874} To this end FIMSAC has advocated for “a consortium of market participants collaborate to develop industry standards for a number of data points, including IIV.”\textsuperscript{1875} Another area of potential standardization that has been suggested in the literature is to use a metric based on “value at risk” (VAR).\textsuperscript{1876} Such a metric could rely on “three parameters” for calculation, “the performance differences between such fund index and their benchmark, the volatility of tracking error and the liquidity spread.”\textsuperscript{1877} VAR has, however, been significantly criticized for its predictive shortcomings and potentially “destabilizing” impact.\textsuperscript{1878}

A further item of required disclosure that lacks calculation uniformity is the bid-ask spread.\textsuperscript{1879} Rule 6c-11 modified the bid-ask disclosure requirement to require issuers to use the national best bid and national best offer to facilitate a more “uniform” calculation.\textsuperscript{1880} The data used to calculate bid-ask can vary and this can impair investor comparatives.\textsuperscript{1881} The SEC initially proposed amendments relating to Form N-1A that would have required ETF sponsors to provide examples of how bid-ask spreads affect investor returns for both long and short term investments, including an “interactive calculator” on the firm’s website for investors to hypothesize various investing scenarios.\textsuperscript{1882} Support for this amendment was varied and some commentators suggested it could overemphasize certain costs (while obscuring others) and mislead investors.\textsuperscript{1883}

\begin{footnotesize}
\textsuperscript{1874} See NYSE Comment Letter, supra note 1810 at 3-4; Eaton Vance Comment Letter, supra note 1528 at 3.
\textsuperscript{1875} FIMSAC Comment Letter, supra note 1816 at 5.
\textsuperscript{1877} See Dorocáková, supra note 1493 at 157.
\textsuperscript{1879} See Comment Letter to SEC of Independent Directors Council on File No. S7-15-18 (September 27, 2018), at 3, available at https://www.sec.gov/comments/s7-15-18/s71518-4446624-175725.pdf (“IDC Letter”) (“Because there is not a uniform method for assessing bid-ask spreads, the bid-ask spread information would not facilitate comparisons between different investment options, as the Commission intends for this disclosure”); John Hancock Comment Letter, supra note 1800 at 2 (“Without uniform data across the industry, the utility of the Bid-Ask Spread Data as a tool to compare similar ETFs would be severely limited.”); Dechert Comment Letter, supra note 1502 at 5 (“there is no uniform standard methodology for calculating bid-ask spreads.”)
\textsuperscript{1880} Rule 6c-11 supra note 1424 at 110-112
\textsuperscript{1881} See SIFMA Comment Letter I, supra note 1425 at 19; CSIM Comment Letter, supra note 1545 at 11.
\textsuperscript{1882} Rule 6c-11 supra note 1424 at 113.
\textsuperscript{1883} See Vanguard Comment Letter, supra note 1844 at 7; BlackRock Comment Letter, supra note 38 at 17; SIFMA Comment Letter II, supra note 1829 at 2-3; Oppenheimer Funds
\end{footnotesize}
Another commenter suggested a discussion of examples would be useful. Ultimately the bid-ask spread examples and interactive calculator was jettisoned by the SEC in its final rule.

c. Strategic Formatting, Contextual Delivery and Digital Enhancement of ETF Disclosures

When disclosure became a cornerstone of U.S. financial market regulation, the “format” of how information was presented was not a primary concern. This has changed over time, and scholars and regulators are now interested in how investment disclosures can be strengthened through behaviorally-enhanced presentation formats. Scholarship also recognizes the “limits” of disclosure, even for sophisticated investors. Yet more can be done on ETF disclosure formats to ease investor comprehension, allow for more efficient product comparisons, and highlight opaque risks. Securities regulators should undertake further investigations on ETF disclosure ordering and contextualization, as well as the use of digital enhancements like visuals.

The International Organization of Securities Commissions (IOSCO), in a 2019 investigation of how behavioral principles can make disclosures more effective, noted that disclosures should be formed with an objective “to direct users’ attention to the most important information included in a disclosure, and to design disclosures such that the most important disclosures are also the most engaging.” A simple review of key documents in the ETF informational ecosystem (prospectus and SAI) reveal dense text-laden formats lacking for

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Comment Letter, supra note 1531 at 4; Fidelity Comment Letter, supra note 1545 at 5; CSIM Comment Letter, supra note 1545 at 10-11.

1884 FIMSAC Comment Letter, supra note 1816 at 6.

1885 See Rule 6c-11 supra note 1424 at 114.


1887 See Tom C.W. Lin, A Behavioral Framework for Securities Risk, 34 Seattle U. L. Rev. 325, 326-328, 370-372 (2011) (the author suggests the use of “spatial” adjustments including better framing and strategic placement of risk factors, categorization, ranking and underlying of certain risks (according to relative impact and likelihood), and using standardized, “menu-like” formats for risk factor disclosure. According to the author the act of disclosure then becomes, concurrently, an act of “risk management” for firms rather than of “litigation avoidance”); see IOSCO Report, supra note 1683 at 11-12.


1889 IOSCO Report, supra note 1683 at 11-12
intention direction.\textsuperscript{1890} Further, as noted by Professors James Cox and John Payne, “context” is valuable in mutual fund disclosures so that the information that is provided to investors is more easily “processable” when choosing between competing funds.\textsuperscript{1891} This is equally applicable to ETFs. Contextual improvements can be found in Rule 6c-11;\textsuperscript{1892} however, one aspect of Rule 6c-11 where the SEC decided against a contextual add-in was in jettisoning the idea of having ETF sponsors provide hypotheticals in an ETF’s prospectus on how bid-ask spreads impact returns for both long and short term traders.\textsuperscript{1893} This omission was justified by the SEC because it would be costly for issuers and it might “obscure” other factors associated with ETF transaction costs like market conditions and order size.\textsuperscript{1894}

Disclosures can also be digitally enhanced to improve investment decision making. A recent recommendation by the OSC in relation to annual fee disclosures in investment funds suggested that a “pop-up” box, that when “moused over” provides a short explanation for technical concepts, could be used to help reduce “cognitive load” on investors when navigating disclosures.\textsuperscript{1895} Another digital enhancement recommendation of the OSC was to use “content-related icons” for key areas of disclosure, which are visually stimulating and attract readers attention,\textsuperscript{1896} as well as “compelling visuals or narratives” including flow diagrams, to explain certain difficult concepts and the various “actors” associated with an investment product.\textsuperscript{1897} Relatedly, the SEC may consider BlackRock’s proposal to construct and maintain a “single interactive calculator tool” that would use “uniform data” to allow for comparative trading costs across different ETFs.\textsuperscript{1898} As noted above, the SEC withdrew its original proposal for ETF sponsors to host trading cost calculators on their individual websites (pursuant to a proposed amendment to Item 3 of Form N-1A);\textsuperscript{1899} however, a single, standardized, centrally controlled and hosted, calculator as proposed by BlackRock would aid investor comparative assessments.\textsuperscript{1900}

\textsuperscript{1890} See case study identified in supra note 1715.
\textsuperscript{1891} See Cox & Payne, supra note 1637 at 911.
\textsuperscript{1892} See infra Part III(a).
\textsuperscript{1893} Rule 6c-11, supra note 1424 at 204.
\textsuperscript{1894} Id. at 204.
\textsuperscript{1895} See Ontario Securities Commission, Behavioral Insights, supra note 1683 at 13.
\textsuperscript{1896} Id. at 15.
\textsuperscript{1897} Id. at 16
\textsuperscript{1898} See BlackRock Comment Letter, supra note 1451 at 18.
\textsuperscript{1899} Rule 6c-11, supra note 1424 at 114.
\textsuperscript{1900} See BlackRock Comment Letter, supra note 1451 at 18.
d. Marketing Practices That Create Clarity and Distinguish Other Fund Structures

As ETFs become more complex, marketing rules may need to be refined to supplement disclosure adjustments.\footnote{See Anita K. Krug, Investors’ Paradox, 43 J. CORP. L. 245, 245 (2018) (contending that “regulatory solutions” for mutual funds that resemble sophisticated and complex investment strategies, otherwise deployed by hedge and private equity funds, should center on “the process by which mutual fund shares are marketed and sold to investors” since disclosure adjustments are largely “ineffective”)} Rule 6c-11 didn’t impose marketing rules on ETF issuers, despite measures required by prior exemptive orders.\footnote{See Rule 6c-11, supra note 1424 at 115.} Previously, ETF sponsors had to distinguish ETFs from mutual funds in their sales literature (for example, by identifying that retail investors can’t redeem ETF shares directly with an ETF sponsor, and also detailing how ETFs are purchased on secondary markets).\footnote{Id.} Not all industry participants agree that investors understand ETF’s subtle (and explicit) distinctions from mutual funds sufficiently to disregard this disclosure.\footnote{See Eaton Vance Comment Letter, supra note 1528 at 8 (“In our experience, a large percentage of investors still do not understand the fundamental distinctions between ETFs and mutual funds relating to buying and selling.”)} It would seem prudent to at least require ETF sponsors to qualify their marketing that the pricing, purchase and sale mechanics of ETFs work differently than mutual funds,\footnote{See CFA Comment Letter, supra note 1810 at 5-6.} and that ETFs have unique risks because of their operational structure.\footnote{See id. at 3} It is also imperative that complex exchange traded products (ETPs) that use derivatives to obtain leverage or inverse exposures, including those that have unique mechanics like daily rebalancing,\footnote{See Rule 6c-11, supra note 1424 at 26.} or have embedded redemption rights for issuers like those found in exchange traded notes (ETNs),\footnote{See Otani & Pellejero, supra note 1556 (discussing the significant risks to investors of exchange traded notes (ETNs) when an issuing bank chooses to redeem and “take them off the market if their value falls below a certain level” and how this scenario has manifest in the coronavirus pandemic resulting in new litigation.)} be identified by investment advisers.

Another needed reform is a formal taxonomy to distinguish ETPs (like ETNs), commodity pools and inverse or leveraged ETPs, from ETF structures that can rely on Rule 6c-11.\footnote{See discussion on this point in Rule 6c-11, supra note 1424 at 30, 198, 210.} The SEC chose not to include a naming...
convention in Rule 6c-11, despite significant industry support for such a taxonomy. Professors Hu and Morley suggest that the most viable nomenclature for ETFs would be “independent of the assets the fund invests in” but capture all funds that use the arbitrage mechanism. They note, however, that naming entails some “measured dynamism” since a rigidly applied rule may not work in the future for new financial product innovations. A naming convention would serve immediate value in distinguishing leveraged and inverse ETPs and ETNs from ETFs. This is timely, since ill-advised ETN exposures wreaked havoc on some retail investor portfolios in the coronavirus pandemic – giving rise to new litigation. Also, ETN credit risk isn’t always reflected in secondary market trading prices. A formalized taxonomy for ETPs (distinguishing ETFs) will require more industry consultation, and potential frameworks have been advanced by both FIMSAC and BlackRock. Also, given the popularity of “sustainable” and “socially responsible” investing, efforts should be made to both simplify, and form conventions around, a standard taxonomy for these products.

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1910 Id. at 118.
1912 Hu & Morley 2, supra note 1459 at 1177.
1913 Id. at 1182.
1914 See Bhattacharya & O’Hara, supra note 1460 at 8-9. (“ETNs are issued by financial institutions and are unsecured debt obligations linked to the return of a market index. Whereas ETFs own the underlying securities, ETNs are more like return swaps tied to a particular index.”)
1915 See Otani & Pellejero, supra note 1556
1918 See FIMSAC Comment Letter, supra note 1816 at 3-4
1919 See BlackRock Comment Letter, supra note 1451 at 25-27.
1920 See Institute of International Finance, supra note 1643 at 3 (here the IIF provides a proposed standardized taxonomy for sustainable investing using the terms “exclusion investments,” “inclusion investments,” “impactful investments,” and “philanthropic investments.”)
e. Ordered and Centralized Simplicity Around the Most Important ETF Factors

The efficacy of mandated disclosures, the degree investors understand them and use them to increase consumer welfare, and the extent they should be reduced or simplified is a matter of standing academic debate. Empirical testing of disclosure is fraught with difficulty and uncertainty. In essence, any attempt to simplify ETF disclosures is an act of “streamlining the environments” where investors synthesize information to make decisions. To this end, Andrew Haldane, in his famous “dog and the frisbee” analogy, has persuasively argued that complex scenarios are often best solved with simple solutions. The message is especially relevant for decision making in ETFs.

Disclosure often traces its roots to Judge Brandeis’ famous declaration that “sunlight is said to be the best of disinfectants.” Yet as noted by Professor Troy Paredes, “sunlight can also be blinding.” Streamlining ETF disclosures helps to overcome “present bias” and aversions to search efforts to find the most suitable investment products. It also reduces the “task size” of the cognitive ask of disclosure review, which can lead to better decision making. To this end a standardized, structured, centrally hosted, and publicly accessible repository (like EDGAR), where ETF issuers report standardized data, and investors can effectively compare ETFs side by side is materially needed.


1922 See Gillis, supra note 1886 at 32-34.

1923 See Ontario Securities Commission, Behavioral Insights, supra note 1683 at 11.


1925 LOUIS D. BRANDEIS, OTHER PEOPLE’S MONEY AND HOW THE BANKERS USE IT, 92 (1914).

1926 See Paredes, supra note 1679 at 419.

1927 See Ontario Securities Commission, Behavioral Insights, supra note 1683 at 47.

1928 See Paredes, supra note 1679 at 441-443.

1929 The benefit of a standardized (and centrally controlled) repository across ETF sponsors is that it allows for maximum comparative impact for investors, See Erik F. Gerding, Disclosure 2.0: Can Technology Solve Overload, Complexity, and Other Information Failures? 90 Tul. L. Rev. 1143, 1174 (2016) (“As with other technologically enhanced disclosure, the challenge
Such measure has industry support, and its implementation should be further studied.  

A centralized comparative mechanism would help filter irrelevant information, which some studies have shown to be decision making distractions.  

Reductive measures for existing disclosures will also need to be further studied, although a challenge with any reductive initiative is that, as Professor Erik Gerding has noted, there is very little (if any) empirical proof of what disclosure items are “superfluous or impose excessive cognitive taxes on investors.”

Presentation format has also been found to have a material impact on how consumers process information.  

A 2015 Wharton Business School working paper provides evidence that a “streamlined” and “easier to understand” menu format for employees choosing between defined contribution retirement investment options lead to better investor risk profiles, lower turnover rates, reduced expense ratios, and more aggregate savings for plan participants.  

Simplified disclosures have also increased the effectiveness of tax credit and employer 401(k) programs.  

Simplifying and ordering ETF disclosures around the most important factors will eliminate the need for investors to take additional steps to use disclosure provided to them.

Any attempt to simplify ETF disclosures, or adjust presentation format, must wrestle with two vital ETF complexities. The first is the ETF arbitrage mechanism. The case for clear disclosure around AP arbitrage is compelling since ETF sponsors may have “asymmetric information” about its fragilities, and

with moving to a web-based, hyperlinked disclosure layout is ensuring that data remains comparable. Who controls the layout is also critical. There is a risk that some issuers might use complex layouts to frame information in ways that unduly accentuate the positive and practically eliminate the negative.

1930 See Morningstar Comment Letter, supra note 1784 at 1-2; FIMSAC Comment Letter, supra note 1816 at 5; Eaton Vance Comment Letter, supra note 1528 at 4; Reagan Comment Letter, supra note 1545; ETF BILD Letter, supra note 1843 at 4.  
1931 See Paredes, supra note 1679 at 442 & fn 17.  
1932 See Gerding, supra note 1929 at 1146.  
1934 See Donald B. Keim & Olivia S. Mitchell, Simplifying Choices in Defined Contribution Retirement Plan Design, PENSION RESEARCH COUNCIL WORKING PAPER, WHARTON SCHOOL, PRC WP2015-07 (June 2015). (The employers in the study streamlined their defined contribution investment options by eliminating “almost half” of the available choices of funds, and taking measures to “simplify the fund menus, and also to make a more coherent categorization or ‘tiering’ of the retained funds,” see pg. 1-2)  
1935 See Loewenstein, Sunstein & Golman, supra note 1684 at 405.  
1936 See Cox & Payne, supra note 1637 at 927.
APs have potentially “misaligned incentives” to step back from performing this function.\textsuperscript{1937} Professor’s Henry Hu and John Morley suggest, given the criticality of arbitrage, disclosure frameworks for ETFs should incorporate a “Management Discussion and Analysis” (MD&A) style narrative where an ETF sponsor provides “its views on the past performance and trends and uncertainties relating to the future outlook for that ETF’s arbitrage mechanism, including as a consequence, analysis of AP-specific, portfolio asset liquidity, and other factors affecting the mechanism’s effectiveness.”\textsuperscript{1938} The Professors posit that the qualitative dynamics of current ETF disclosure (the Management’s Discussion of Fund Performance) has a “mutual fund mindset” based on NAV performance, not arbitrage instabilities.\textsuperscript{1939} It is also worthwhile to further study the use of visuals, computer aided graphics or other interactive components that create a “vivid display,”\textsuperscript{1940} as these are likely to be more compelling to investors in illustrating ETF arbitrage rather than simple text overlay.\textsuperscript{1941}

Second, given the tremendous index heterogeneity in the ETF industry, as documented by Professor Robertson, further studies should be undertaken to determine how to simplify and clarify disclosures around index construction, variability and methodology, while providing transparency on affiliate index licensing fees, design and influence - beyond a description of what’s purportedly being tracked by the ETF. \textsuperscript{1942} Morningstar has advocated that index methodology be provided in a “standardized format” upon ETF launch, and include “rules regarding securities selection and weighting.”\textsuperscript{1943} Index construction methodology disclosure reform has also been advocated by industry stakeholders.\textsuperscript{1944} Appropriately, as noted by the \textit{Index Industry Association}, such a move will also require further investigation on how to appropriately “balance”

\textsuperscript{1937} See Loewenstein, Sunstein & Golman, \textit{supra} note 1684 at 391 (“We review literature examining the effects of laws and regulations that require public disclosure of information. These requirements are most sensibly imposed in situations characterized by misaligned incentives and asymmetric information between, for example, a buyer and seller or an advisor and advisee.”); \textit{see} at 393 (“such requirements are applied when less informed consumers interact with better informed sellers and when the incentives of the consumers and sellers are at least arguably misaligned.”)

\textsuperscript{1938} See Hu & Morley 2, \textit{supra} note 1459 at 1162.

\textsuperscript{1939} \textit{Id.} at 1175.

\textsuperscript{1940} Loewenstein, Sunstein & Golman, \textit{supra} note 1684 at 410.

\textsuperscript{1941} See Ontario Securities Commission, Behavioral Insights, \textit{supra} note 1683 at 15.

\textsuperscript{1942} See Robertson, \textit{supra} note 1440 at 843-844.

\textsuperscript{1943} See Morningstar Comment Letter, \textit{supra} note 1784 at 2.

\textsuperscript{1944} See ETF.com Comment Letter, \textit{supra} note 1545.
intellectual property rights of index creators with enhanced investor transparency.1945

f. Cash-Like ETFs and Safeguarding Liquidity Transformation

In the lead up to the March 2020 coronavirus pandemic a report by the European Systemic Risk Board indicated that ETFs were increasingly being used as cash substitutes.1946 Industry reports on the pandemic selloff confirmed this observation, as investors utilized ultra-short duration bond ETFs like BlackRock’s iShares 1-3 Year Treasury Bond ETF (SHY) as an alternative to holding risky assets.1947 After the Fed announced support for money market mutual funds (MMMFs) and commercial paper, investor flows from cash-like ETFs (being held as MMMF equivalents) were also reported.1948 Prior to the 2008 crisis, MMMFs were also used as cash substitutes that offered higher returns than bank deposits;1949 yet they ended up needing government support after investing in toxic commercial paper and experiencing an investor run.1950 The Fed’s support of short-duration credit ETFs, considering their act of “liquidity transformation” in turning bonds into cash substitutes, is eerily reminiscent of intervention in the MMMF market.1951 Therefore, an evaluation of post-crisis disclosure reforms in MMMFs, as potentially also applicable to ETFs, is a worthy undertaking since credit ETFs now benefit from a similar

1948 See Aramonte & Avalos, supra note 1472 at 1-4.
1949 See TIMOTHY F. GEITHNER, STRESS TEST: REFLECTIONS ON FINANCIAL CRISIS, (New York: Broadway Books, 2014); 195-96, (stating that “[m]oney market funds were widely viewed as virtually indistinguishable from bank deposits as similarly safe vehicles for storing cash with slightly better interest rates”).
1951 Clements, supra note 1416 at 839-841
“implicit guarantee” as MMMFs that the government will support the market in a crisis.1952

Most ETFs are organized as “open-ended management investment companies”,1953 thus they use the same Form N-1A for information disclosure as short duration credit mutual funds, and MMMFs, subject to certain particularized requirements for each respect fund structure.1954 MMMF regulations were amended after the 2008 crisis to better “address run risks” and included, among other reforms, prudential measures and stress tests, “floating” NAV for sales and redemptions, and redemption fees and gates.1955 Even through ETFs trade in the secondary market, and are not redeemed by investors in the same way as MMMFs, they have shown evidence of facilitating investor herd formation, and they could suffer from primary market runs by APs when bond qualities deteriorate.1956 The fact that some ETFs are being substituted for cash (like MMMFs), and the reality that both markets have experienced a government backstop, warrant further comparative analysis. Particularly on the extent that cash-like ETFs could benefit from prophylactic measures including stress tests, additional disclosures, and primary market creation and redemption safeguards.1957

g. Specific Reforms for the ETF Model Portfolio Industry

ETF model portfolios should also look to incorporate standardized reporting requirements in addition to the SEC’s adviser advertising rules

1952 Id.
1953 See Rule 6c-11, supra note 1424 at 154.
1954 See U.S. SEC. & EXCH. COMM’N, Form N-1A, available at https://www.sec.gov/files/formn-1a.pdf; Some of the particular requirements for ETFs include disclosure of the principal market the ETF trades on (see at 1); narrative disclosure around brokerage commissions, creation units, secondary market pricing, the arbitrage function and premiums and discounts (see at 4, 15). Unique requirements for MMMFs include certain omissions relating to portfolio turnover, risks, management, shareholder information and other matters (see pgs. 2, 8, 14); particularized risk disclosures (see pg. 9-10); and disclosure of “material events” (see pg. 30-31).
1956 See Bhattacharya & O’Hara, supra note 1460 at 6.
governing false or misleading statements. Requiring investors to access comparative tools through private market solutions undermines a fundamental selling point of ETFs in the first place – low cost “democratized” access to a diversified portfolio - since these comparative tools are inaccessible to many retail investors. Also, as ETF heavyweights like BlackRock and Fidelity look to enter the non-transparent ETF space, the use of these and actively managed ETFs in model portfolios will make investor comparisons even more difficult.

Securities regulators should look to undertake further industry consultations in the emerging ETF model portfolio industry to assess the suitability of current regulatory standards, and gauge how effectively (and accurately) investors can compare products including standardized performance calculations and website disclosure layout formats. Like mutual funds, ETFs now comprise a core component of many saver’s retirement portfolios. As ETF model portfolios grow in popularity, prior scholarly concerns around misleading marketing for actively managed mutual funds becomes relevant, and must be closely monitored and safeguarded against. This bears particular weight given evidence that investors often purchase funds based on historical returns, not fund specific features.

1958 See Loder, supra note 1647.
1960 Loder, supra note 1647.
1962 See Beverly Chandler, Assessing the Impact of Regulatory Change, ETF EXPRESS SPECIAL REPORT (May 15, 2020), https://www.etfexpress.com/2020/05/15/285658/assessing-impact-regulatory-change (“Another challenge comes from the fact that a lot of advisers use ETFs in model portfolios as building blocks and Tuffy wonders if they will include active strategies.”)
vi. Conclusion

ETFs have many benefits and have become very popular.\textsuperscript{1966} Yet, ETFs may also be contributing to investor herd formation,\textsuperscript{1967} impairing the information efficiency and price responsiveness of underlying assets,\textsuperscript{1968} and exacerbating volatility and disruptive market events.\textsuperscript{1969} This article has illuminated another crucially needed element of ETF discussion: it is extremely difficult (at times even impossible) for ETF investors to easily compare products or their performance, without the aid of costly third party aggregators. The ETF industry engages in wide operational, financial, marketing and management discretion, and this creates incredible challenges when investors attempt to compare products. This predicament is compounded by disclosure effectiveness challenges given investor cognitive limitations and behavioral tendencies.

Despite improvements in Rule 6c-11, much more can be done to make ETF product comparisons easier for investors. It would greatly aid ETF side-by-side comparisons if the SEC standardized website formats and layouts, required uniform calculation methodologies for key ETF variables (such as NAV and IIV), and created a standardized ETF nomenclature or taxonomy system including standards for sustainable investing. Also, investor product

\textsuperscript{1966} The popularly of ETFs as an index investment is based on the ability to obtain low cost diversification in alignment with portfolio choice and market general equilibrium theories. See Harry Markowitz, \textit{Portfolio Selection}, 7(1) J. Fin 77 (1952); William F. Sharpe, \textit{Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk}, 19(3) J. Fin 425 (1964); J. Lintner, \textit{The Valuation of Risk Assets and the Selection of Risky Investments in Stock Portfolios and Capital Budgets}, 47(1) REV. OF ECON. AND STATISTICS 13 (1965); There are also a variety of recent demand drivers behind the popularity of ETFs, independent from other index funds including liquidity, cost and tax advantages of ETFs over mutual funds, access to otherwise opaque and hard to purchase asset classes, use of ETFs as cash substitutes by institutional investors, ability of firms to quickly duplicate novel structures, securities lending, and take up by fintech firms and “robo-advisors” see Clements, \textit{supra} note 1416 at 17-23.

\textsuperscript{1967} See Bhattachaya & O’Hara, \textit{supra} note 1460 at 6-7.

\textsuperscript{1968} This occurs because ETF investors favor the “systematic” factor of risk over asset specific “idiosyncratic” factors, see \textit{id.} at 1-2.

\textsuperscript{1969} \textit{Id.} at 3.
comparisons would be materially improved through a system of structured
electronic reporting by ETF sponsors of standardized data to a centrally
controlled public repository. Investors also stand to materially benefit from
additional studies around strategic disclosure ordering and digital enhancement,
and further contextual discussion around critical concepts like AP arbitrage and
index composition methodology. Also, the ETF “model portfolio” industry is
an emerging concern which needs to be studied (and standardized) to reduce
informational opacity and improve comparisons.

Other areas worthy of further investigation in ETFs include whether
behavioral “nudges” and other mechanisms of “libertarian paternalism” have
viability for ETF disclosures.1970 Using behavioral economics in disclosure
reform may not correct for impulsivity or “self-control problems.”1971 Direct
intervention in the ETF market would rely on a welfare economics justification
of “consumer fallibility” - thus regulatory “intervention” would aid investor
decision-making, ensure a competitive ETF marketplace, and avoid adverse
selection of unsuitable products.1972 This would need to balance the benefit of
financial product innovation while mitigating system-wide risks.1973 It must also
take into account the cognitive biases that affect regulators when designing and
enacting such measures.1974 Finally, the growing influence of BlackRock on U.S.
and global governments, 1975 and the global financial system through its
integrated “Aladdin” risk management and modelling “financial operating
system,”1976 is worthy of much deeper investigation.1977 This is especially
warranted given widespread failure of “risk management systems” and models

1970 See Thaler & Sunstein, supra note 1697; Richard Thaler & Cass Sunstein, Libertarian
Paternalism, 93(2) AM. ECON. REV. 175 (2003); Cass R. Sunstein & Richard H. Thaler,
1971 See Ryan Bubb & Richard H. Pilides, How Behavioral Economics Trims its Sails and Why,
127 HARV. L. REV. 1593, 1649 (2014) (“After all, Odysseus did not instruct his sailors to
provide him with a ‘Total Cost of Swimming with the Sirens’ disclosure as soon as he got
within earshot.”)
1972 See Schwartz, supra note 1841 at 522, 526-527.
1973 See Bhattachaya & O’Hara, supra note 1460 at v (forward by Sir Paul Tucker, Chairman,
Systemic Risk Council).
1974 See Choi and Pritchard, supra note 1677 at 20-42.
1975 See Annie Massa & Caleb Melby, In Fink We Trust: BlackRock Is Now ‘Fourth Branch of
1976 See Dirk Andreas Zetzsche, William A Birdthistle, Douglas W Arner, & Ross P. Buckley,
Financial Operating Systems, EUROPEAN BANKING INSTITUTE (EBI) WORKING PAPER SERIES
1977 See Tett, supra note 1471.
to effectively predict or guard against prior crises, operational failures, or disruptive market events.¹⁹⁷⁸

Conclusion

This dissertation intersects with a growing body of literature on economic “financialization” – a term commonly used to describe the financial market’s increasing size, variability, complexity, profitability, the continual transformation of the real economy to electronically identifiable (and instantly tradeable) financial devices, and the orientation (by individuals, firms, media and society at large) towards financial market activity.1979 The origins and definition of financialization are complex, multi-faceted and no single causal factor is determinative.1980

One scholar has described financialization as “a pattern of accumulation in which profits accrue primarily through financial channels rather than through trade and commodity production.”1981 This definition would explain institutional uptake of market-based products (including the use of ETFs and ETPs in portfolios) away from “activity-centered” or production-based capital investments.1982 It also helps to explain the much greater levels of trading, significantly increased market complexity and interconnectivity, and the multitude and diversity of financial products that currently exist.1983

Other scholars suggest that financial market participants exert disproportional “influence” over economic policy, and in turn engage in wealth transfers (economic rents) in their favor.1984 In addition to BlackRock’s growing

influence over government policy, as noted in Chapters Four and Five, additional support for this idea can be found in the increased size and complexity of financial market operations, buttressed by the fact (as detailed in Chapter Four) that corporate decision making is now largely “dominated by and beholden to financial markets.” Further, numerous “financialization enhancing” regulatory measures have been enacted over the past fifty years in the U.S. including: deregulation, competition restrictions, tax breaks that favor financial market incumbents, the erosion of labor market protections, and increased global trade and international business and capital mobility. 

Researchers trace the origins of financialization in the U.S. to numerous events starting as early as the nineteenth century onset through demographic changes, globalization, sector specialization and increased household savings, increased financial service firm prominence, and direct social and political engineering. The growth of “shadow banking” has also been cited as has greater demand for investment management services, and an explosion of “household credit” (including residential mortgages and consumer debt).

One study suggests that financialization took place in four “phases.” The first from the turn of the 20th century until after the New Deal; a second

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1988 See Philippon & Reshef, supra note 1980 at 73-76.
1991 See Philippon & Reshef, supra note 1980 at 94.
1994 See id. at 4-6.
1995 Id.
“transitory phase” continuing until the 1940s; a third “golden age of capital
development” taking place until the mid-1970s; and a final phase that
established “financialized capitalism” and mirrored the first phase in terms of
financial sector dominance, income share, shareholder value orientation,
frequency of financial innovation, income inequality, and use of leverage.

Other cited factors include foreign competition resulting in firms shifting
investments from “production” activities to “portfolio holdings” for short-term
profits; a revolution in “shareholder value” as the dominant ethos of
corporate governance; the ubiquity of executive pay incentives linked to
stock market performance; and an increase in institutional and individual
investment, heightened market volatility and trading volume, investment banks
becoming publicly traded (rather than using partnership models) and pursuing
“proprietary trading” over traditional underwriting and advising, while
developing exotic financial products (often using complex derivatives).

Deregulation has also been cited as a causal factor. To this end, numerous early twentieth century deregulatory measures including the Federal Reserve Act of 1913, the Federal Farm Loan Act of 1916, and the McFadden Act of 1927, collectively worked to expand credit markets for farms, individuals and small businesses. Other cited measures in the literature include the U.S. Supreme Court’s decision in Marquette Nat. Bank of Minneapolis v. First of Omaha Service Corporation; the 1980 enactment of the Depository Institutions Deregulation and Monetary Control Act; the passage of the Employment Retirement Income Security Acts of 1974 and 1978 and the Garn-

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1997 Id. at 2.
1998 Id at 30-31.
1999 Krippner, supra note 1979 at 182.
2000 See id. at 201.
2001 See Donald Tomaskovic-Devey, & Ken-Hou Lin, Financialization: Causes, Inequality Consequences, and Policy Implications, 18 N.C. BANKING INST. 167 (2013);
2003 Id at 323.
2005 439 U.S. 299 (1978) (allowing banks to charge interest rates in other states at the rate allowed by their chartering state).
2006 This measure created mega-banks, drove credit and savings union growth, and fostered a wave of new financial and banking products, see Donald Tomaskovic-Devey & Ken-Hou Lin, Income Dynamics, Economic Rents, and the Financialization of the U.S. Economy, 76 AMERICAN SOCIOLOGICAL REVIEW 538, 544 (2011).
Financialization has undoubtedly been influenced by the proliferation of economic theories like the capital asset pricing model (“CAPM”), and the Black Scholes option pricing theory, the rise of credit rating agencies and systems for small businesses, and technological advances facilitating investment decision making “detached” from considerations of underlying business ownership. Also, market liquidity expansions (and more exchanges), and the dismantling of Bretton Woods have been cited in the academic literature as contributing. Finally U.S. bipartisan housing “pro-ownership policies” creating government sponsored entities and aiding the proliferation of MBSs and CDOs have been associated with financialization. Also contributing are developments in information technology and computer processing speeds, including the use of algorithmic and “high frequency” trading; corporate takeover activity (driven in part by anti-trust relaxations in the 1980s) with executive pay tied to stock performance.


2009 See Mitchell, supra note 2002 at 331.


2013 See Mitchell, supra note 2002 at 323.


2016 See Dagher, supra note 2004 at 39.


Individually there is now more fund and direct share ownership than ever before,\textsuperscript{2019} with higher individual debt levels and more access to credit.\textsuperscript{2020} Individuals interfacing with markets may be somewhat attributable to firms moving away from “defined benefit plans” (guaranteeing a specific retirement income) towards “defined contribution” plans, owned and managed by employees.\textsuperscript{2021} Finance now also has a “daily” role in media placement and culture, and around the globe governments look to adopt “finance-friendly policies” including accommodating market structures, central bank independence, and reduced capital regulations.\textsuperscript{2022}

Financialization has many significant societal and economic implications. Some scholars cite it association with the “collapse” of the middle class,\textsuperscript{2023} an increase in speculative trading,\textsuperscript{2024} the proliferation of leverage and debt,\textsuperscript{2025} the propagation of “too-big-to-fail” financial institutions,\textsuperscript{2026} a decline in productivity growth,\textsuperscript{2027} political volatility and class-based cultural warfare,\textsuperscript{2028} “warped” societal values,\textsuperscript{2029} manufacturing outsourcing and and
income inequality, lower rates of entrepreneurialism, and declining manufacturing, industrial investment, and productive enterprise. These negative sentiments lead one to recall Karl Polanyi’s famous “transformation” assessment of markets – that they first are “embedded in social relations” and then they evolve to later capture all of society which becomes merely “an accessory to the economic system.” Financialization has also been criticized as “money for nothing” and associated with a form of unproductive economic “rent seeking.”

Some even go as far as calling it “unproductive finance” and a cause of societal income inequality. Concerns have been cited in the literature that excessive financial industry compensation may be “leeching growth from other sectors” and enticing students to pursue financial careers over other, more productive, ventures. Lord Adair Turner, former head of the United Kingdom’s Financial Services Authority, has stated that many modern financial market activities are “economically useless” and laments banks

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2030 See Davis & Kim, supra note 2018.
2033 See CEDRIC DURAND, FICTITIOUS CAPITAL, HOW FINANCE IS APPROPRIATING OUR FUTURE (2014).
2035 Id. at 75.
2040 The Financial Services Authority was the primary regulatory of financial services in the U.K. until it was abolished in 2013 and replaced by the two regulatory bodies, the Financial Conduct Authority (FCA) and the Prudential Regulation Authority (PRA), see NEW STATESMAN, UK REPLACES FSA WITH TWO NEW REGULATORY AUTHORITIES (April 2, 2013), https://www.newstatesman.com/business/business/2013/04/uk-replaces-fsa-two-new-regulatory-authorities.
2041 Lord Adair Turner, What Do Banks Do, What Should They Do And What Public Policies Are Needed To Ensure Best Results For The Real Economy? SPEECH TO CASS BUSINESS SCHOOL (March 17, 2010).
modulating credit for speculative trading away from “productive” enterprises (like manufacturing). It is possible that financialization may have also created a “new business cycle” that unlike previous conceptions (based on wage and productivity growth) is now driven by “asset price inflation” and “debt-financed spending.” Other studies suggest that certain types of financial product innovations have increased volatility (through “interaction” effects and “flash crashes”) – a contention supported by numerous findings in this dissertation. A wide array of studies also links financialization to income inequality, and as negatively impacting employment.

Yet it cannot be denied that modern financial markets have created many positive benefits including economic diversification, enhanced financial product supply, improved allocation of risk to capable bearers and reduced financing costs for businesses; enhanced liquidity, price discovery, credit expansion, global interaction, information transmission and utilization; and the potential for finance to positively engineer social change and facilitate socially responsible investing. The continuing expansion of finance has arguably made markets more efficient in many ways. Increased trading can lead to stabilizing activity when prices deviate from efficient levels, and it also enhances

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2044 Palley, supra note 1984 at 20.


2047 See Davis & Kim, supra note 2018 at 204; see also Gerald F. Davis After The Corporation, 41 POLITICS & SOCIETY 283, 283-308 (2013); Batt & Appelbaum, supra note 2007 at 3, 6.

2048 See Greenwood & Scharfstein, supra note 1993 at 3, 6.


2051 Palley, supra note 1984 at 4.
market liquidity. The IMF has associated “financial development” with positive byproducts like “growth”, “resilience”, “diversification and management of risk” and “resource allocation.” However, the IMF also acknowledges that there may be “limits” to the benefits of financialization and that “financial deepening” in mature markets can negatively impact productivity growth. As such, the IMF suggests that financial development and economic growth has a “bell-shaped” relationship, and a similar “non-linear relationship” to economic stability.

There are other arguments in favour of financialization. Finance “allows technologies to be paid for before they exist” thus linking entrepreneurship with financial market activity. As a result, the system can serve as a “bridge between the expectations of future profits and the ability to realize them by assembling needed resources in the present.” It may also foster economic growth. Additionally it can facilitate “information transmission, risk sharing, and allocation of capital” as well as increase the quality of financial products and services.

This dissertation contributes to the “financialization” literature by providing a history and institutional back story, assessment of demand factors, market size, product variety, use overview, and analysis of emerging risks and regulatory concerns in ETPs and ETFs. It has shown how a post-GFC explosion in the size, complexity and variety of the ETF market has interconnected a multitude of financial market participants in a complex operational ecosystem driven by discretionary incentives, and that this in turn has given rise to new systemic risks and informational inefficiencies.

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2054 See id. at 16-17.
2055 Id. at 5.
2056 Id.
2057 See Max Jerneck, Financialization Impedes Climate Change Mitigation: Evidence From The Early American Solar Industry, 3(3) SCIENCE ADVANCES 1, 2 (2017); See JOSEPH A. SCHUMPETER, CAPITALISM, SOCIALISM AND DEMOCRACY (1st ed. 1942).
2058 Jerneck, id.
2060 See Rousseau & Sylla id.
Further, it has detailed, in a unique and original way how ETFs, and their sponsors, are generating new interconnectivity-based systemic risks; and that existing regulatory frameworks in the U.S. are insufficient to adequately curtail emerging concerns. It has also illuminated, in a first of its kind investigation that, due to a myriad of industry discretionary behaviors and disclosure inefficiencies, simple “side-by-side” product comparisons in ETFs are extremely difficult, if not impossible, to undertake.

Fragilities embedded in the ETF ecosystem were prominently manifest in the March 2020 COVID-19 pandemic. Here parallels between ETFs and disruptive financial innovations from the past - portfolio insurance in the October 1987 “Black Monday” stock market crash, and auction rate securities in the GFC – became clear. The promise of instant liquidity, when such liquidity is dependent on the discretionary actions of financial institutions, is illusory at best, and destabilizing at worst. The Federal Reserve’s unprecedented act of buying credit ETFs as a stabilization measure during the COVID-19 crisis highlights how important, and interconnected, ETFs have become to modern capital markets. Even more ominously, the crisis has illuminated how influential BlackRock – the largest of all ETF sponsors – has become.

Contextual to the submission of this dissertation new studies are emerging which support the conclusions and assessments from this doctoral research: namely the world’s largest asset managers (who are also the world’s largest ETF sponsors) are growing systemically important with an unprecedented level of economic power and influence, and with the growth of these firms, and the ETF market as a whole, there is a corresponding increase in market volatility and noise transmission, and a decrease in the informational efficiency of securities prices.2061

The conclusions and assessments from this dissertation regarding ETFs and ETPs harken the work of Hyman Minsky and his “money manager capitalism hypothesis” (MMCH).2062 Minsky, who rose to public prominence


after the GFC with his endogenous theory of financial instability, which posited that over periods of extended economic tranquility banks and other financial intermediaries destabilize the financial system by introducing increasingly risky products and credit, also cautioned against the destabilizing impact that asset managers could levy on the financial system. Minsky warned that financial markets would evolve as a function of the profit seeking activities of financial firms themselves, not just those businesses undertaking traditional or “productive” enterprises, and that over time this would make the financial system more fragile, while increasing the size and power of large financial intermediaries – particularly asset managers.

While ETPs and ETFs undoubtedly have significant benefits, this dissertation has also shown they are creating new risks and regulatory concerns. While further investigation into this sector is warranted (and the industry will undoubtedly continue to grow, resulting in more academic and regulatory studies) this dissertation suggests three core recommendations.

First, considering their growing economic influence (and market concentration), complex lawyers of interconnectivity, creation of new unique risks, and government backstop (and in the case of BlackRock even sway) greater regulatory scrutiny and safeguards are warranted for the largest ETF sponsors. Second, enhanced controls and standards over credit ETFs, liquidity transformation, and the proliferation of “cash-like” ETF products should be considered. Third, investor-focused reforms aiding ETF comparisons (even if these reforms are paradigm shifting in terms of disclosure) are needed.

In conclusion, this dissertation highlights a variety of areas where further research is warranted, and the author intends on pursuing such investigations post-doctorate. First, there is a clear need for further research on the systemic importance of ETFs and the growing power and influence of their sponsors (including the world’s largest asset managers such as BlackRock and Vanguard).

2064 See Wray supra note 2062.
2065 See H.P Minsky, Schumpeter and finance, in Salvatore Biasco, Alessandro Roncaglia, and Michele Salvati (eds), MARKET AND INSTITUTIONS IN ECONOMIC DEVELOPMENT: ESSAYS IN HONOUR OF PAULO SYLOS LABINI (1993).
Such lines of inquiry harmonize with the previously noted MMCH – a theory that should be further mined for its wisdom in nascent market developments.

Additional investigations into nascent ETF structures that are emerging contextual to this dissertation submission such as the ETF “model portfolio” industry, and active, non-transparent, and “smart-beta” product structures are warranted. Also, it is worthwhile to research growing concerns of model, concentration, and correlation risk given the emergence of influential risk management systems like BlackRock’s Aladdin program. Relatedly, there is a need for further investigation into the implications, and necessary regulatory adaptations, relating to ETFs as cash substitutes, as well as the extent ETFs serve as volatility drivers with distortive market impacts.

The MMCH also has implications for private equity firms who have pivoted recently, away from traditional “leveraged buy-outs” to other forms of financial intermediation like credit origination and shadow banking.\textsuperscript{2066} Given the fragilities in credit markets exhibited by the coronavirus pandemic (including bond pricing opacity, volume, dealer support, and ETF price dislocations), the Federal Reserve’s intervention in the market, and the way that credit ETFs, and other shadow banking enterprises, both interconnect borrowers with credit product investors, and potentially stimulate investor herds, credit moral hazard, and originate to distribute incentives, wide investigation of the modern shadow banking industry is critical. Such investigation is in alignment with calls for a return to the separation of commercial and investment banking, and enhanced controls on financial entities that can issue “cash-like” financial products.\textsuperscript{2067}

Research on modularity and other safeguards to mitigate against the harmful impacts of financial market collective action problems are also needed. Finally, there should be further investigation into investor-focused disclosure ordering, and digital enhancements in ETF disclosures, as well as added contextual discussion around critical concepts like ETF arbitrage and index composition methodology. Disclosure ordering and digital enhancements also have considerable value for general securities disclosure across all issuers.

\textsuperscript{2066} See Andrew F. Tuch, The Remaking of Wall Street, 7 HARV. BUS. L. REV. 315 (2017); see Mark Vandevelde & Sujeet Indap, Apollo: how a private equity giant is navigating the crisis, FINANCIAL TIMES (April 28, 2020), https://www.ft.com/content/6fce9808-84ab-11ea-b555-37a289098206.

\textsuperscript{2067} See ARTHUR E. WILMARTH, JR. TAMING THE MEGABANKS (FORTHCOMING 2020, OXFORD UNIVERSITY PRESS).
Bibliography


Agarwal, Vikas, Paul E. Hanouna, Rabih Moussawi, & Christof W. Stahel., Do ETFs Increase the Commonality in Liquidity of Underlying Stocks? 28TH ANNUAL CONFERENCE ON FINANCIAL ECONOMICS AND ACCOUNTING; FIFTH


AMERICANS FOR FINANCIAL REFORM EDUCATION FUND, LETTER TO FINANCIAL STABILITY OVERSIGHT COUNCIL, RE: RIN 4030-AA00, “Authority to
REQUIRE SUPERVISION AND REGULATION OF CERTAIN NON-BANK FINANCIAL COMPANIES” (May 13, 2019),


Aquilina, Matteo, Karen Croxson, Gian Giacomo Valentini & Lachlan Vass, Fixed Income ETFs: Primary Market Participation and Resilience of Liquidity During Periods of Stress, FINANCIAL CONDUCT AUTHORITY, RESEARCH NOTE


Austin, D. Andrew, *Auction Rate Securities*, CONGRESSIONAL RESEARCH SERVICE REPORT 7-5700 (July 17, 2012).


**BEBCHUK, LUCIAN A. & JESSE FRIED, PAY WITHOUT PERFORMANCE: THE UNFULFILLED PROMISE OF EXECUTIVE COMPENSATION** (1ST ED. 2004).


Bell, H. *High frequency trading: Do regulators need to control this tool of informationally efficient markets?* CATO INSTITUTE, POLICY ANALYSIS NO. 731 (2013).


**BERNANKE, BEN S. THE COURAGE TO ACT: A MEMOIR OF A CRISIS AND ITS AFTERMATH (1ST ED. 2015).**


Block, Fred. The Contradictory Logics of Financialization: Bringing Together Hyman Minsky and Karl Polanyi, 44(1) POLITICS & SOCIETY 3 (2016).


BOGLE, JOHN C. THE BATTLE FOR THE SOUL OF CAPITALISM (1ST ed. 2005).


BRANDEIS, LOUIS D. *OTHER PEOPLE’S MONEY AND HOW THE BANKERS USE IT*, 92 (1914).


Chatwell, Peter. The liquidity ‘doom loop’ in bond funds is a threat to the system, FINANCIAL TIMES (March 24, 2020), https://www.ft.com/content/b7c15426-6e1b-11ea-89df-41bea055720b.


COOTNER, PAUL. THE RANDOM CHARACTER OF STOCK MARKET PRICES (1ST ed. 1964).


D’Silva, Adrian, Haley Gregg & David Marshall, Explaining The Decline In The Auction Rate Securities Market, 236 CHICAGO FED LETTER 1, 2 (2008).


DAS, SATYAJIT, TRADERS, GUNS & MONEY: KNOWNS AND UNKNOWNS IN THE DAZZLING WORLD OF DERIVATIVES (2ND ED. 2010).

Das, Satyajit WMD Old and New Primed For Next Financial Crisis, BLOOMBERG OPINION (May 8, 2018),


**DAVIS, GERALD.** MANAGED BY THE MARKETS: HOW FINANCE RESHAPED THE MARKETS (1ST ED. 2009).


Davis, Gerald, Diekmann, Kristina A. & Tinsley, Catherine H. *The Decline and Fall of the Conglomerate Firm in the 1980s: The De-Institutionalization of an Organizational Form*, 59 AMERICAN SOCIOLOGICAL REVIEW 547 (1994).


Dean, Steven A. *Neither Rules Nor Standards*, 87 NOTRE DAME L. REV. 537 (2011).


DEPOSITORY TRUST CLEARING CORPORATION, *The Next Crisis Will Be Different: Opportunities To Continue Enhancing Financial Stability 10 Years After Lehman’s Insolvency*, INDUSTRY WHITE PAPER (September 2018).


DOUGLAS, WILLIAM O. *DEMOCRACY AND FINANCE* (1st ed. 1940).


DURAND, CEDRIC. FICTITIOUS CAPITAL, HOW FINANCE IS APPROPRIATING OUR FUTURE (2014).


FINANCIAL STABILITY OVERSIGHT COUNCIL, BASIS FOR THE FINANCIAL STABILITY OVERSIGHT COUNCIL’S RESCISSION OF ITS DETERMINATION REGARDING GE CAPITAL GLOBAL HOLDINGS, LLC (2016).


FINANCIAL TIMES, ETF Q&A: The good the bad and the synthetic (January 31, 2010), https://www.ft.com/content/44f0b7b6-0cce-11df-b8eb-00144feabdc0.


Frankel, Matthew. *3 Triple-Leveraged ETFs, and Why You Shouldn’t Buy Any Of Them*, MOTLEY FOOL (June 25, 2017),

Friedberg, Barbara. Leveraged ETFs Are A Loser’s Game, U.S. NEWS & WORLD REPORT (April 18, 2018),

FRIEDMAN, MILTON. CAPITALISM AND FREEDOM (1ST ED. 1962).

FRIEDMAN, MILTON. THE CASE FOR FLEXIBLE EXCHANGE RATES, IN ESSAYS IN POSITIVE ECONOMICS, (1ST ed. 1953).

Friedman, Milton. The Social Responsibility of Business is to Increase its Profits, NEW YORK TIMES MAGAZINE (September 13, 1970).

Friesen, Garth. ETFs Won’t Cause The Next Wave of Panic Selling In The Bond Market, FORBES (August 14, 2018),


Flood, Chris. ‘Big Ticket’ Trades Made Possible By Bond ETF Liquidity, FINANCIAL TIMES (June 17, 2018), https://www.ft.com/content/b5e0bb88-5865-11e8-806a-808d194f7b75.

Flood, Chris. BlackRock fights ‘too big to fail’ fears, FINANCIAL TIMES (Nov. 4, 2013), https://www.ft.com/content/e79d2280-4553-11e3-b98b-00144feabdc0.

Flood, Chris. Top 10 Institutional Investors Fuel Market Volatility, Study Finds, FINANCIAL TIMES (August 8, 2020),
https://www.ft.com/content/00bb26e7-16ac-45b1-b56e-74f8f0aa7e42?shareType=nongift.

Flood, Chris & Attracta Mooney, Crude Price Crash Hits Oil-Linked Exchange Traded Products, FINANCIAL TIMES (March 15, 2020),
https://www.ft.com/content/ce8a2b61-8f71-4bea-a391-3564b4409e28.

FORM OF PROSHARES TRUST II AUTHORIZED PARTICIPANT AGREEMENT, available at


Gai, Prasanna, Andrew Haldane & Sujit Kapadia, Complexity, Concentration and Contagion, 58 J. OF MONETARY ECON. 453 (2010).


GEITHNER, TIMOTHY F. STRESS TEST: REFLECTIONS ON THE FINANCIAL CRISIS (1ST ED. 2014).


Gerdin, Erik F. Code, Crash, and Open Source: The Outsourcing of Financial


Giulietti, Corrado, Mirco Tonin, & Michael Vlassopoulous, When the Market Drives You Crazy: Stock Market Returns and Fatal Car Accidents, IZA


Gutscher, Cecile & Yakob Peterseil, The Liquidity ‘I llusion’ Has These Funds Making Plans for a Stock Doomsday, BLOOMBERG (April 10, 2019),


Hajric, Vildan & Annie Massa, ETFs Use Anything For Attention To Crack Tough Market, BLOOMBERG (December 20, 2018),


Haldane, Andrew G. Rethinking the Financial Network, Speech Given to Financial Student Association, Amsterdam (April 28, 2009), available at https://www.bis.org/review/r090505e.pdf.

Haldane, Andrew G & Vasileios Madouros, SPEECH AT THE FEDERAL RESERVE BANK OF KANSAS CITY’S 366TH ECONOMIC POLICY SYMPOSIUM, “The


Han, Bing, Ya Tang, & Liyan Yang, Public Information and Uninformed Trading: Implications for Market Liquidity and Price Efficiency, 163 JOURNAL OF ECONOMIC THEORY 604, 605 (2016).


Harris, Lawrence. The Dangers of Regulatory Overreaction to the October 1987 Crash, 74 CORNELL L. REV. 927 (1989).


Jansen, Eric. *When a robo-advisor is, or isn’t, the right choice*, CNBC (June 5, 2018), https://www.cnbc.com/2018/06/04/when-a-robo-advisor-is-or-isnt-the-right-choice.html.


KAHNEMAN, DANIEL, THINKING FAST AND SLOW (1st ed. 2011).


KEYNES, J.M. *THE GENERAL THEORY OF EMPLOYMENT, INTEREST AND MONEY* (1ST ED. 1936).


Kim, Tae. *Goldman Sachs Says Computerized Trading May Make Next “Flash Crash” Worse*, CNBC (May 23, 2018),


Kowalik, Michal. *Opacity and Disclosure in Short-Term Wholesale Funding Markets*, FEDERAL RESERVE BANK OF BOSTON WORKING PAPER RPA 16-02, 1 (September 15, 2016).


Langevoort, Donald C. *Basic at Twenty: Rethinking Fraud on the Market*, 209 Wis. L. Rev. 151, 173-74.


government-isnt-to-blame-for-the-rise-of-wall-street/?utm_term=.1ef98b15ff76.


Leopold, Les. *Big Lie: America Doesn’t Have #1 Richest Middle-Class In The World...We’re Ranked 27th*, HUFFPOST (June 28, 2013), https://www.huffingtonpost.com/les-leopold/big-lie-america-doesnt-ha_b_3516185.html.


LEWIS, MICHAEL, FLASH BOYS (1st ed. 2014).

LEWIS, MICHAEL, PANIC! THE STORY OF MODERN FINANCIAL INSANITY (1ST ED. 2009).

LEWIS, MICHAEL. THE BIG SHORT: INSIDE THE DOOMSDAY MACHINE (1ST ED. 2010).


Li, Yun. *Michael Burry of ‘The Big Short’ says he has found the next market bubble*, CNBC (September 4, 2019), https://www.cnbc.com/2019/09/04/the-big-shorts-michael-burry-says-he-has-found-the-next-market-bubble.html.


Mackenzie, Michael. The Federal Reserve has gone well past the point of ‘QE Infinity’, FINANCIAL TIMES (March 23, 2020), https://www.ft.com/content/11b338a2-6d0c-11ea-89df-41bea055720b.


Malamud, S., A dynamic equilibrium model of ETFs, CEPR DISCUSSION PAPER SERIES, No DP11469 (2016).

Maley, Matt The Real Reason For The 1987 Crash, As Told By A Salomon Brothers Veteran, CNBC (October 16, 2017),


MINSKY, HYMAN. CAN "IT" HAPPEN AGAIN? ESSAYS ON INSTABILITY AND FINANCE. (1ST ED. 1982).


Minsky, H.P *Schumpeter and finance*, in Salvatore Biasco, Alessandro Roncaglia, and Michele Salvati (eds), MARKET AND INSTITUTIONS IN ECONOMIC DEVELOPMENT: ESSAYS IN HONOR OF PAULO SYLOS LABINI (1993)

MINSKY, HYMAN. STABILIZING AN UNSTABLE ECONOMY (1ST ED. 1986).


Mooney, Attracta. *Stock Lending By ETF Operators Worries Investors*, FINANCIAL TIMES (Feb. 4, 2018), https://www.ft.com/content/d4706b0e-e40a-11e7-a685-5634466a6915.


Oranburg, Seth C. A Place Of Their Own: Crowds In The New Market For Equity Crowdfunding, 100 MINN. L. REV. HEADNOTES 147, 152 (2016).


Ospovitich, Alexander & Dave Michaels, Big-Three Stock Exchanges Sue SEC Over Trading-Fee Plan, THE WALL STREET JOURNAL (February 15, 2019),


PARTNOY, FRANK, INFECTIOUS GREED: HOW DECEIT AND RISK CORRUPTED THE FINANCIAL MARKETS (1ST ED. 2009).

PAULSON, HENRY M. JR. ON THE BRINK: INSIDE THE RACE TO STOP THE COLLAPSE OF THE GLOBAL FINANCIAL SYSTEM (1ST ED. 2010).


Peirce, Hester. Regulating through the Back Door at the Commodity Futures Trading Commission, MERCATUS WORKING PAPER, MERCATUS CENTER AT GEORGE MASON UNIVERSITY (November 2014).

PEREZ, CARLOTA TECHNOLOGICAL REVOLUTIONS AND FINANCIAL CAPITAL: BUBBLES AND GOLDEN AGES (1ST ED. 2003) (AND ASSOCIATED WORKS).


PIKETTY, THOMAS, CAPITAL IN THE TWENTY-FIRST CENTURY (1ST ED 2014).


Plender, John. When Financial Innovation Turns Toxic, FINANCIAL TIMES (February 20, 2016), https://www.ft.com/content/55e3103e-d4bc-11e5-829b-8564e7528e54.


Poljak, Vesna. Fund Managers Believe Exchange Traded Funds Will Have A Role In The Next Crisis, FINANCIAL REVIEW (Oct. 22, 2017),


POSNER, RICHARD A. *A FAILURE OF CAPITALISM* (1st ed. 2009).


PRESIDENTIAL TASK FORCE ON MARKET MECHANISMS (1988): REPORT OF THE PRESIDENTIAL TASK FORCE ON MARKET MECHANISMS. NICHOLAS BRADY (CHAIRMAN), U.S. GOVERNMENT PRINTING OFFICE.


Riquier, Andrea. Three fund managers may soon control nearly half of all corporate voting power, researchers warn, MARKETWATCH (Sept. 20, 2019),


SCHEINKMAN, JOSE A. SPECULATION, TRADING AND BUBBLES (1ST ed. 2014).


SCHUMPETER J.A., CAPITALISM, SOCIALISM AND DEMOCRACY (1ST ed. 1942).


Schwarcz, Steven L. Rethinking the Disclosure Paradigm in a World of Complexity, 2004 U. ILL. L. REV. 1, 4-5.


**SHARPE, WILLIAM F. PORTFOLIO THEORY AND CAPITAL MARKETS 77-78 (1970).**


**SHEFRIN, HERSH. BEYOND GREED AND FEAR: UNDERSTANDING BEHAVIORAL FINANCE AND THE PSYCHOLOGY OF INVESTING (1ST ed. 2000).**


**SHLEIFER, ANDREI. INEFFICIENT MARKETS (1ST ed. 2000).**


**SHILLER, R. FINANCE AND THE GOOD SOCIETY (1ST ed. 2012).**


**SHILLER, R.J. 2015. IRRAVISIONAL EXUBERANCE (3RD ed. 2015).**


SIMON, HERBERT. *MODELS OF BOUNDED RATIONALITY* (1982).


SORKIN, ANDREW ROSS. *TOO BIG TO FAIL: THE INSIDE STORY OF HOW WALL STREET AND WASHINGTON FOUGHT TO SAVE THE FINANCIAL SYSTEM – AND THEMSELVES* (1ST ED. 2009).


Taleb, Nassim Nicholas, Antifragile (1st ed. 2014).

Taleb, Nassim Nicholas, Black Swan (1st ed. 2010).

Taleb, Nassim Nicholas, Fooled By Randomness (1st ed. 2004).


Tett, Gillian. ETFs are the canary in the bond coal mine, Financial Times (July 29, 2020), https://www.ft.com/content/6bdc7747-3ab9-4410-a4b2-ba9acbe204e8.


Thomas, David. *A Warning From The Late John Bogle*, FORBES (February 12, 2019), https://www.forbes.com/sites/greatspeculations/2019/02/12/a-warning-from-the-late-john-bogle/?fbclid=IwAR2nJ2IRa12gI7zP5xLX3oALr5CwccctcoR21ccSk7tgAMczd46mRy5m9P-Q#53d8c122b99.

Thompson, Jennifer *Virtue Signaling ETFs: Religion, Veganism and Marijuana Used to Tap Trends*, FINANCIAL TIMES (July 28, 2019), https://www.ft.com/content/7d4147e2-9e2e-11e9-b8ce-8b459ed04726.


**TRACKINSIGHT, How is Optimized Sampling Conducted?**


Turner, Lord Adair, *What Do Banks Do, What Should They Do And What Public Policies Are Needed To Ensure Best Results For The Real Economy?* SPEECH TO CASS BUSINESS SCHOOL (March 17, 2010).


tells-senator-elizabeth-warren-that-it-is-monitoring-clo-markets/#7a52a2be2124.


Vandevelde, Mark & Sujeet Indap, Apollo: how a private equity giant is navigating the crisis, FINANCIAL TIMES (April 28, 2020), https://www.ft.com/content/6fce9808-84ab-11ea-b555-37a289098206.


VEBLEN, THORSTEIN. THE THEORY OF BUSINESS ENTERPRISE (1904; Mentor ed 1958).


Walker, Owen. *Funds ‘snowball’ means big firms can only get bigger*, FINANCIAL TIMES (June 9, 2018), https://www.ft.com/content/1611bea8-68d3-11e8-b6eb-4acfcfb08c11.


WILMARTH, ARTHUR E. JR. *TAMING THE MEGABANKS* (FORTHCOMING 2020, OXFORD UNIVERSITY PRESS).


Zwirn, Daniel. Jim Kyung Soo Liew & Ajakh Ahmad, *This Time Is Different, but It Will End the Same Way: Unrecognized Secular Changes in the Bond Market since the 2008 Crisis That May Precipitate the Next Crisis,*