

**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.¹ As a result, a tradable financial instrument represents nearly every real economic interest,² 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”³ continues to expand.⁴ 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).⁵

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

¹ See generally Michael Collins, *Wall Street and The Financialization Of The Economy*, FORBES (February 4, 2015), <https://www.forbes.com/sites/mikecollins/2015/02/04/wall-street-and-the-financialization-of-the-economy/#4f6e026d5783>; see INVESTOPEDIA, *Financialization*, <https://www.investopedia.com/terms/f/financialization.asp>.

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.ineteconomics.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/6fce9808-84ab-11ea-b555-37a289098206> (discussing the rise of shadow banking in the private equity industry).

⁴ See generally Robin Greenwood & David Scharfstein, *The Growth of Finance*, 27(2) JOURNAL OF ECONOMIC PERSPECTIVES 3 (2013).

⁵ See Rachel Evans & Carolina Wilson, *How ETFs Became The Market*, BLOOMBERG (September 13, 2018), <https://www.bloomberg.com/graphics/2018-growing-etf-market/?srnd=etfs>; M. Lettau & A. Madhavan, *Exchange-Traded Funds 101 for Economists*, 32(1) JOURNAL OF ECONOMIC PERSPECTIVES 135, 135-138 (2018).

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*

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 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>.

*Journal*⁷), Chapter Two (a reproduction of two articles, one published in April 2020 on the *Duke Global Financial Markets Center FinReg blog*,⁸ and the other published in April 2020 on the *Columbia Law School Blue Sky Corporate and Securities Blog*⁹), and Chapter Five (an article which is forthcoming in the *Virginia Law and Business Review*).¹⁰ These articles show that ETFs are operationally reliant on the discretionary behaviors of independent financial market intermediaries, and as a result are vulnerable in a crisis.

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).¹¹

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

⁷ See Ryan Clements, *New Funds, Familiar Fears: Do Exchange Traded Funds Make Markets Less Stable? Part I, Liquidity Illusions*, 20 HOU. BUS. & TAX L. J. 15 (2020).

⁸ See Ryan Clements, *What Have We Learned So Far About ETFs In The COVID-19 Crisis*, DUKE UNIVERSITY SCHOOL OF LAW GLOBAL FINANCIAL MARKETS CENTER FINREG BLOG (April 3, 2020), <https://sites.law.duke.edu/thefinregblog/2020/04/03/what-have-we-learned-so-far-about-etfs-in-the-covid-19-crisis/#comment-668>.

⁹ See Ryan Clements, *Are ETFs Making Some Asset Managers Too Interconnected To Fail?* COLUMBIA LAW SCHOOL BLUE SKY BLOG (April 7, 2020), <https://clsbluesky.law.columbia.edu/2020/04/07/are-etfs-making-some-asset-managers-too-interconnected-to-fail/>.

¹⁰ Ryan Clements, *Exchange-Traded Confusion: How Industry Practices Undermine Product Comparisons in Exchange Traded Funds*, VA. L. & BUS. REV. (forthcoming, Fall 2020)

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*

¹² See Ryan Clements, *New Funds, Familiar Fears: Are Exchange Traded Funds Making Markets Less Stable? Part II Interaction Risks* (forthcoming) HOU. BUS. & TAX L. J. 15 (2021).

Law.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.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.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*).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.¹⁷ The challenge in comparing ETFs is compounded by disclosure effectiveness limitations given investor cognitive tendencies and behavioral inclinations.¹⁸

¹³ Ryan Clements, *Are ETFs Making Some Asset Managers Too Interconnected To Fail?* 22(4) U. PA. J. BUS. L. 722 (2020).

¹⁴ See *infra*, Chapter Two, Four & Five.

¹⁵ See *infra*, Chapter Two & Five.

¹⁶ See Clements, *supra* note 10.

¹⁷ See *infra*, Chapter Five.

¹⁸ *Id.*

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 1940.¹⁹ 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.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.²¹ It also relates to the work of Hyman Minsky and his “*Money Manager Capitalism Hypothesis*” (MMCH).²² Minsky’s “financial

¹⁹ U.S. SEC. & EXCH. COMM’N, *Exchange Traded Funds*, Investment Company Act Release No. 33,646 (September 25, 2019), 84 Fed. Reg. 57,162, 57,166 (Oct. 24, 2019) (to be codified at 17 C.F.R. pts. 210, 232, 239, 270, 274), available at <https://www.sec.gov/rules/final/2019/33-10695.pdf>.

²⁰ See *infra*, Chapter Five.

²¹ See *infra*, Conclusion.

²² See L. Randall Wray, *Minsky’s Money Manager Capitalism and the Global Financial Crisis*, Working Paper 661, LEVY ECONOMICS INSTITUTE OF BARD COLLEGE (1996); Hyman Minsky, *Uncertainty and the Institutional Structure of Capitalist Economies*, Working Paper 155, LEVY

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.

ECONOMICS INSTITUTE OF BARD COLLEGE (1996); Hyman P. Minsky, *Money Manager Capitalism*, HYMAN P. MINSKY ARCHIVE. Paper 13 (1989), http://digitalcommons.bard.edu/hm_archive/13; C.J. Whalen, (2002), *Money manager capitalism: Still here, but not quite as expected*, 36(2) J. OF ECON. ISSUES (2002).

²³ See Hyman P. Minsky *The Financial Instability Hypothesis*, LEVY ECONOMICS INSTITUTE OF BARD COLLEGE WORKING PAPER NO. 74 (May 1992); Minsky, H.P. *Financial instability revisited: The economics of disaster*. 3 REAPPRAISAL OF THE FEDERAL RESERVE DISCOUNT MECHANISM 97 (1972).

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.²⁸ 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.²⁹ Trading discounts from NAV were also witnessed, however, in normally “ultra-stable” short-maturity bond ETFs.³⁰

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 dissertation³¹) and other market makers stopped performing arbitrage in credit ETFs as liquidity and trading volume in underlying bond markets disappeared.³² Bond markets became opaque, volatile and expensive (manifest through increasingly widened bid-ask spreads),³³ 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.³⁴

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

²⁸ See Gillian Tett, *ETFs are the canary in the bond coal mine*, FINANCIAL TIMES (July 29, 2020), <https://www.ft.com/content/6bdc7747-3ab9-4410-a4b2-ba9acbe204e8>; Lewis Braham, *Emerging Market ETF Pricing Another Victim of the Coronavirus Outbreak*, BARRON’S (March 26, 2020), <https://www.barrons.com/articles/emerging-market-etf-pricing-another-victim-of-the-coronavirus-outbreak-51585217700>; Clements, *supra* note 8; Andrea Riquier, *ETFs behaving badly: ‘exactly what they are supposed to do’ or ‘just what we feared’?* MARKETWATCH (March 28, 2020), <https://www.marketwatch.com/story/heres-how-to-think-about-the-turbulence-in-etf-pricing-and-heres-what-to-do-about-it-2020-03-27>.

²⁹ See Sirio Aramonte & Fernando Avalos, *The recent distress in corporate bond markets: cues from ETFs*, BANK FOR INTERNATIONAL SETTLEMENTS BULLETIN NO. 6 (April 14, 2020), 1-4, available at <https://www.bis.org/publ/bisbull06.pdf>; See Dawn Lim, *Bond ETFs Flash Warning Signs of Growing Mismatch*, THE WALL STREET JOURNAL (March 23, 2020), <https://www.wsj.com/articles/bond-etfs-flash-warning-signs-of-growing-mismatch-11584964801>.

³⁰ See Brian Chappatta, *Bond ETFs Will Never Be The Same After Coronavirus*, BLOOMBERG OPINION (March 23, 2020), <https://www.bloomberg.com/opinion/articles/2020-03-23/coronavirus-bond-etfs-will-never-be-the-same-after-this-crisis>; see Lim, *supra* note 13.

³¹ See *infra*, Chapter One, Four & Five.

³² See Katherine Greifeld & Luke Kawa, *Fed’s Historic Step Into Credit Markets May Cure ETF Dislocations*, BLOOMBERG (March 23, 2020), <https://www.bloomberg.com/news/articles/2020-03-23/fed-credit-backstop-fuels-surge-in-investment-grade-bond-etfs>; see Aramonte & Avalos, *supra* note 13 at 4.

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).³⁵ These intermediaries operate with discretionary incentives, not legal obligations, and ETFs rely on them for their smooth operation and stability.³⁶ 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.³⁷ 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.³⁸ 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.³⁹ 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.⁴⁰

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),⁴¹ and only after that point did ETF prices realign with their underlying NAV.⁴² Prior to the SMCCF the Federal

³⁵ See *infra*, Chapter One.

³⁶ See Clements, *supra* note 7 at 25-26.

³⁷ *Id.* at 45-51.

³⁸ *Id.*

³⁹ See Greifeld & Luke Kawa *supra* note 32.

⁴⁰ See Clements, *supra* note 7 at 45-49; see Floyd Norris, *A Computer Lesson Still Unlearned*, N.Y. Times (Oct. 18, 2012), <https://www.nytimes.com/2012/10/19/business/a-computer-lesson-from-1987-still-unlearned-by-wall-street.html>; Mark Carlson, Fed. Red. Bd., 2007-13, A BRIEF HISTORY OF THE 1987 STOCK MARKET CRASH WITH A DISCUSSION OF THE FEDERAL RESERVE RESPONSE IN FINANCE AND ECON. DISCUSSION SERIES, DIV. OF RES. STAT. & MONETARY AFFAIRS (Nov. 2006), at 11-12.

⁴¹ FEDERAL RESERVE, POLICY TOOLS, SECONDARY MARKET CORPORATE CREDIT FACILITY, <https://www.federalreserve.gov/monetarypolicy/smccf.htm> (last visited June 28, 2020).

⁴² See Katherine Greifeld, *One Month of Fed ETF Buying Redraws \$4 Trillion Market Contours*, BLOOMBERG (June 16, 2020), <https://www.bloomberg.com/news/articles/2020-06-16/a-month-of-fed-bond-etf-buying-and-what-it-did-to-markets>.

Reserve had never purchased credit ETFs;⁴³ 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).⁴⁴

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.⁴⁵ As this dissertation will show, conflict fears have materialized as a significant number of the Fed financed ETFs have been BlackRock products.⁴⁶ Such fears, and the growing influence of BlackRock's "*Aladdin*" risk management and modelling technology will be discussed in Chapter Four in support of heightened prudential regulation for the world's largest asset managers and ETF sponsors.⁴⁷

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.⁴⁸ 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.⁴⁹

⁴³ See Andrea Riquier, *The Fed is Going to Buy ETFs. What Does It Mean?* MARKETWATCH (March 30, 2020), <https://www.marketwatch.com/story/the-fed-is-going-to-buy-etfs-what-does-it-mean-2020-03-23>.

⁴⁴ See Katherine Greifeld, *Fed Lifeline Saves Bond Funds Teetering on Brink of ETF Hell*, BLOOMBERG (March 28, 2020), <https://www.bloomberg.com/news/articles/2020-03-28/fed-lifeline-shields-bond-funds-teetering-on-brink-of-etf-hell>; See Greifeld & Luke Kawa *supra* note 16.

⁴⁵ 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>.

⁴⁶ See Matthew Boesler, Katherine Greifeld & Catarina Saraiva, *Fed Reveals ETFs It Purchased in Emergency Lending Program*, BLOOMBERG (May 29, 2020), <https://www.bloomberg.com/news/articles/2020-05-29/fed-reveals-which-etfs-it-purchased-in-emergency-lending-program>.

⁴⁷ See *infra*, Chapter Four.

⁴⁸ See *infra*, Chapter Four & Five; see Marco Pagano, Antonio Sanchez Serrano & Josef Zechner, *Can ETFs Contribute To Systemic Risk?* REPORTS OF THE ADVISORY SCIENTIFIC COMMITTEE NO.9, EUROPEAN SYSTEMIC RISK BOARD (June 2019), 3-4, 28-29, https://www.esrb.europa.eu/pub/pdf/asc/esrb.asc190617_9_canetfscontributesystemicrisk~983ea11870.en.pdf; see Aramonte & Avalos, *supra* note 13 at 1-4.

⁴⁹ 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

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 Five⁵⁰), has similarities to the MMMF market in 2008.⁵¹ 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.⁵²

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 become “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*).⁵³ 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.⁵⁴

The second recommendation is for enhanced controls over credit ETF origination, liquidity transformation, and the origination and trading of “cash-

viewed as virtually indistinguishable from bank deposits as similarly safe vehicles for storing cash with slightly better interest rates”); Martin Kacperczyk & Philipp Schnabl, *When Safe Proved Risky: Commercial Paper during the Financial Crisis of 2007-2009*, 24(1) J. OF ECON. PERSPECTIVES. 29, 34-7 (2010).

⁵⁰ See *infra*, Chapters Four & Five.

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

⁵² See *infra* Chapter Five; See Eva Su, *Money Market Mutual Funds: A Financial Stability Case Study*, CONGRESSIONAL RESEARCH SERVICE, IN Focus (March 24, 2020), available at <https://crsreports.congress.gov/product/pdf/IF/IF11320>; see U.S. SEC. & EXCH. COMM’N, *SEC Adopts Money Market Fund Reform Rules*, (July 23, 2014), [https://www.sec.gov/news/press-release/2014-](https://www.sec.gov/news/press-release/2014-143#:~:text=Website%20Disclosure%20%E2%80%93%20Money%20market%20funds,use%20of%20affiliate%20sponsor%20support)

143#:~:text=Website%20Disclosure%20%E2%80%93%20Money%20market%20funds,use%20of%20affiliate%20sponsor%20support.

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.⁵⁵ These products revealed arbitrage fragility and financial intermediary “step-away” risk (as identified in Chapter One)⁵⁶ and investor herd risk (as identified in Chapter Three)⁵⁷, 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.⁵⁸

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.⁵⁹ 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.⁶⁰

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:
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3343976

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.⁶¹ Most citizens have very little in common with a Wall Street firm.⁶² 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.⁶³ ETFs are investment products that trade on exchanges (like stocks) but “track an underlying index” or basket of assets (like securities, bonds or commodities).⁶⁴ 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.⁶⁵ 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.⁶⁶

Given their numerous benefits,⁶⁷ the post-GFC ETF market has experienced remarkable growth.⁶⁸ Recent estimates peg the U.S. market at \$3.4 trillion, up from pre-GFC levels of just over \$500 billion.⁶⁹ The menu of available ETFs have surged worldwide from 1622 in 2008 to 6478 in 2018,⁷⁰

⁶¹ See Quentin Fottrell, *10 Years After Lehman Brothers Collapse, People Are ‘Deeply Distrustful’ of Wall Street*, MARKETWATCH (September 23, 2018), <https://www.marketwatch.com/story/10-years-after-lehman-brothers-collapse-are-people-smarter-with-their-money-2018-09-17>.

⁶² See Heesun Wee, *The Problem With Wall Street Greed 5 Years After The Crash*, CNBC (September 13, 2013), <https://www.cnbc.com/id/101022751>.

⁶³ See Rachel Evans & Carolina Wilson, *How ETFs Became The Market*, BLOOMBERG (September 13, 2018), <https://www.bloomberg.com/graphics/2018-growing-etf-market/?srnd=etfs>.

⁶⁴ See James Chen, *Exchange Traded Fund (ETF)*, INVESTOPEDIA (January 16, 2019), <https://www.investopedia.com/terms/e/etf.asp>.

⁶⁵ *Id.*

⁶⁶ See ETF GUIDE, *Why ETFs Are Beating Mutual Funds*, SEEKING ALPHA (July 13, 2018), <https://seekingalpha.com/article/4187043-etfs-beating-mutual-funds>.

⁶⁷ See *infra* Section II(iii).

⁶⁸ For an analysis of the growth in the global ETF market from 2003 to 2018 see STATISTA, *Development of Assets of Global Exchange Traded Funds (ETFs) From 2003 to 2018*, <https://www.statista.com/statistics/224579/worldwide-etf-assets-under-management-since-1997/> (last visited May 31, 2019).

⁶⁹ See Eva Su, *Exchange Traded Funds (ETFs): Issues For Congress*, CONGRESSIONAL RESEARCH SERVICE, CRS REPORT R45318, 1 (September 24, 2018), available at <https://fas.org/spp/crs/misc/R45318.pdf>.

⁷⁰ See STATISTA, *Number of Exchange-Traded Funds (ETFs) Worldwide From 2003 to 2018*, <https://www.statista.com/statistics/278249/global-number-of-etfs/> (last visited May 31, 2019).

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 worrisome⁷³ 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 complex⁷⁶ *Exchange Traded Products* (ETP)).⁷⁷ They’ve also stimulated a host of concerns about complexity,

⁷¹ See Su, *supra* note 69.

⁷² See Dominic Litz, *Risk, Reward, Robo-Advisers: Are Automated Investment Platforms Acting In Your Best Interest?* 18 J. HIGH TECH. L. 367 (2018).

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>.

⁷⁴ See Rachel Evans, *The Debate Over Bond ETFs Rages on The Sidelines at Milken*, BLOOMBERG (May 1, 2018), <https://www.bloomberg.com/news/articles/2018-05-01/-hero-or-villain-bond-etf-debate-rages-on-the-milken-sidelines>.

⁷⁵ The reliance on discretionary actors to maintain the integrity and stability of the ETF ecosystem has been cited recently by several researchers, and will be discussed in detail in this article, see Henry T.C. Hu & John Morley, *A Regulatory Framework For Exchange Traded Funds*, 91 S. CAL. L. REV. 839 (2018); see Henry T.C. Hu & John Morley, *The SEC and Regulation of Exchange-Traded Funds: A Commendable Start and a Welcome Invitation.*, 92 S. CAL. L. REV. 1155 (2019); CENTRAL BANK OF IRELAND, *Exchange Traded Fund Discussion Paper* (2017), 41-51, available at <https://www.centralbank.ie/docs/default-source/publications/discussion-papers/discussion-paper-6/discussion-paper-6---exchange-traded-funds.pdf> (hereinafter “CBI Discussion Paper”); 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) at 13-14 (hereinafter “DTCC”); Srichander Ramaswamy, *Market Structures and Systemic Risks of Exchange Traded Funds*, BANK FOR INTERNATIONAL SETTLEMENTS WORKING PAPER NO. 343 (April 2011), available at <https://www.bis.org/publ/work343.pdf> (hereinafter “BIS ETF study”).

⁷⁶ See Hu & Morley, *A Regulatory Framework*, *supra* note 75 at 916; see also Martin Small, *Don’t Confuse ETFs with ETPs*, BUSINESS INSIDER (February 11, 2018), <https://www.businessinsider.com/dont-confuse-etfs-with-etps-2018-2>.

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,⁷⁸ counterparty and collateral risk for synthetic ETFs,⁷⁹ and price and information inefficiency for underlying assets.⁸⁰ They may also increase systemic risk since they extend the “financial intermediation chain”⁸¹ and behaved peculiarly during periods of market volatility in 2010, 2015, and 2018.⁸²

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.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.⁸⁴ Evidencing this trend, passive investment vehicle ownership of U.S. equities will soon cross the 50 percent threshold⁸⁵ and ETFs, as a growing significant portion of the passive index universe, could be facilitating more speculative market trading activity.⁸⁶

See U.S. SECURITIES AND EXCHANGE COMMISSION, *SEC Proposes New Approval Process For Certain Exchange-Traded Funds* (June 28, 2018), <https://www.sec.gov/news/press-release/2018-118>.

⁷⁸ See DTCC *supra* note 75 at 13-14.

⁷⁹ See CBI Discussion Paper, *supra* note 75 at 41-51.

⁸⁰ 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).

⁸¹ See BIS ETF study, *supra* note 75; see also Stefano Battiston, Guido Caldarelli, Robert M. May, Tarik Roukny, & Joseph Stiglitz, *The Price Of Complexity In Financial Markets*, 113(36) PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, PNAS 10031, 10031-10036 (September 2016), available at <https://doi.org/10.1073/pnas.1521573113>; see also Kathryn Judge, *Fragmentation Nodes: A Study in Financial Innovation, Complexity, and Systemic Risk*, 64 STAN. L. REV. 657 (2012).

⁸² See Su, *supra* note 69 at 17-20; see also Hu & Morley, *A Commendable Start*, *supra* note 75 at 1174.

⁸³ See Su, *supra* note 69 at 16; see also Owen Walker, *Funds ‘snowball’ means big firms can only get bigger*, FINANCIAL TIMES (June 9, 2018), <https://www.ft.com/content/1611bea8-68d3-11e8-b6eb-4acfcfb08c11>.

⁸⁴ See Joanna Ossinger, *JPMorgan Sees ‘Violent’ Markets on Volatility-Liquidity Loop*, BLOOMBERG (April 8, 2019), <https://www.bloomberg.com/news/articles/2019-04-08/jpmorgan-blames-violent-markets-on-volatility-liquidity-loop>; see also John Gittelsohn, *The \$1.9 Trillion Fund Giant With a Crazy Idea About Investing*, BLOOMBERG (May 14, 2019), <https://www.bloomberg.com/news/features/2019-05-14/the-1-9-trillion-fund-giant-with-a-crazy-idea-about-investing>.

⁸⁵ See Erin Arvedlund, *John Bogle pens WSJ op-ed warning index funds becoming too big*, THE PHILADELPHIA INQUIRER (November 29, 2018), <http://www2.philly.com/philly/business/john-bogle-vanguard-wsj-index-funds-blackrock-state-street-fidelity-20181129.html>.

⁸⁶ See William A. Birdthistle, *The Fortunes and Foibles of Exchange Traded Funds: A Positive Market Response To The Problems of Mutual Funds*, 33 DEL. J. CORP. L. 69, 94-95 (2008); see also Ricardo Crisostomo & Jorge Medina, *ETFs and Financial Stability; A Compendium of Possible Risk Sources*, CNMV BULLETIN QUARTER IV, 71, 75 (2018) (“Empirical studies suggest that investors who acquire shares in ETFs hold them for a shorter period than they

Concerns have also been cited about potential conflicts of interest in ETF's use of collateral,⁸⁷ and leverage.⁸⁸ 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.⁸⁹ 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.⁹⁰ 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)⁹¹ 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.⁹²

The *Depository Trust & Clearing Corporation* (America's largest post-trade infrastructure provider)⁹³ 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."⁹⁴ 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.

⁸⁹ See John C. Bogle, *Bogle Sounds A Warning on Index Funds*, THE WALL STREET JOURNAL (November 29, 2018), https://www.wsj.com/articles/bogle-sounds-a-warning-on-index-funds-1543504551?mod=trending_now_4.

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/?fbclid=IwAR2nJ2IRa12gI7zP5xLX3oALr5CwcctcoR21ccSk7tgAMczd46mRy5m9P-Q#53dbcf022b99>. ("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.*

⁹³ See DEPOSITORY TRUST & CLEARING CORPORATION, <http://www.dtcc.com> (last visited November 29, 2018).

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.

⁹⁷ See Hu & Morley, *A Regulatory Framework*, *supra* note 75 at 847; see also William M. Humphries, *Leveraged ETFs: The Trojan Horse Has Passed The Margin Rule Gates*, 34 SEATTLE U. L. REV. 299 (2010); Kathryn Judge, *Investor-Driven Financial Innovation*, 8 HARV. BUS. L. REV. 291 (2018); Jill E. Fisch, *Rethinking The Regulation of Securities Intermediaries*, 158 U. PA. L. REV. 1961 (2010); Garrett M. Fischer, *New Twists on an Old Plot: Investors Look To Avoid The Wash Sale Rule By Harvesting Tax Losses With Exchange Traded Funds*, 88 WASH U. L. REV. 229 (2010); John Yoder & Bo J. Howell, *Actively Managed ETFs: The Past, Present, and Future*, 13 J. BUS. & SEC. L. 231 (2013).

⁹⁸ See Bret E. Strzelczyk, *Rise Of The Machines: The Legal Implications For Investor Protection With The Rise of Robo-Advisors*, 16 DEPAUL BUS. & COM. L.J. 55 (2017); Benjamin P. Edwards, *The Rise Of Automated Investment Advice: Can Robo-Advisers Rescue The Retail Market?* 93 CHI.-KENT L. REV. 97 (2018); Litz, *supra* note 12 (ETFs are discussed as used by algorithmic wealth management platforms); see also Scot Hirst, *The Case For Investor Ordering*, 8 HARV. BUS. L. REV. 227, 255 (2018) (ETFs are discussed in relation to “investor ordering” proposals as an alternative to mandatory rules); see also Paul H. Edelman, Randall S. Thomas & Robert B. Thompson, *Shareholder Voting In An Age of Intermediary Capitalism*, 87 S. CAL. L. REV. 1359 (2014); Dorothy S. Lund, *The Case Against Passive Shareholder Voting*, 43 J. CORP. L. 493 (2018); Giovanni Strampelli, *Are Passive Index Funds Active Owners? Corporate Governance Consequences of Passive Investing*, 55 SAN DIEGO L. REV. 803 (2018) (ETFs are discussed in relation to trends and issues in corporate governance and shareholder voting given the rise of passive investment); See also John Morley, *The Separation of Funds and Managers: A Theory of Investment Fund Structure and Regulation*, 123 YALE L.J. 1228 (2014) (ETFs are discussed in conjunction with other funds in contrast to organization business structures); see also Michael C. Macchiarola & Daniel Prezioso, *Expanding Alternatives: From Structured Notes To Structured Funds*, 19 U. PA. J. BUS. L. 405 (2017) (ETFs are discussed in contrast to Unit Investment Trusts); see also Gabriel Rauterberg & Andrew Verstein, *Index Theory: The Law, Promise and Failure of Financial Indices*, 30 YALE J. ON REG. 1, 7 (2013) (ETFs are discussed briefly in a critique on financial indexes).

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*

article will illuminate both sides of this debate and will illustrate the complexities in the ETF operational structure which drive the conflict.

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.¹⁰² 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 market growth figures and demand drivers; and explaining the 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,¹⁰³ 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.¹⁰⁴

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

GENERAL THEORY OF EMPLOYMENT, INTEREST, AND MONEY (1st ed. 1936), re-quoted in Jacobs *infra* note 102 at 93.

¹⁰² For an in-depth study on the propensity of Wall Street to create such products see BRUCE I. JACOBS, *TOO SMART FOR OUR OWN GOOD: INGENIOUS INVESTMENT STRATEGIES, ILLUSIONS OF SAFETY, AND MARKET CRASHES* (1st ed. 2018).

¹⁰³ See Hu & Morley, *A Regulatory Framework*, *supra* note 75; Hu & Morley, *A Welcome Invitation*, *supra* note 55.

¹⁰⁴ See DEUTSCHE BUNDESBANK, *The Growing Importance of Exchange Traded Funds in the Financial Markets*, MONTHLY REPORT (October 2018), 79, available at <https://www.bundesbank.de/resource/blob/766600/2fd3ae4f0593fb2ce465c092ce40888b/mL/2018-10-exchange-traded-funds-data.pdf> (hereinafter "Deutsche Bundesbank ETF Report").

of financial intermediary “rent-seeking”¹⁰⁵ and other non-productive economic behaviors by market participants.¹⁰⁶ This compliments previous work investigating the risks and impacts of economic “financialization.”¹⁰⁷ Finally, it evaluates “supply-side”¹⁰⁸ 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.¹⁰⁹

¹⁰⁵ For a definition of rent-seeking see Anne O. Krueger, *The Political Economy of the Rent Seeking Society*, 64 AM. ECON. REV. 291 (1974).

¹⁰⁶ For a discussion of the externalities in the modern financial system including non-productive intermediation see JOHN KAY, *OTHER PEOPLE'S MONEY: THE REAL BUSINESS OF FINANCE* (1st ed. 2015); see also Robert C. Hockett & Saule Omarova, *The Finance Franchise*, 102 CORNELL L. REV. 1143 (2017).

¹⁰⁷ For critiques of the modern “financialization” of the real economy see Bruce Bartlett, ‘Financialization’ as a Cause of Economic Malaise, THE NEW YORK TIMES (June 11, 2013), <https://economix.blogs.nytimes.com/2013/06/11/financialization-as-a-cause-of-economic-malaise/>; Michael Collins, *Wall Street and The Financialization Of The Economy*, FORBES (February 4, 2015), <https://www.forbes.com/sites/mikecollins/2015/02/04/wall-street-and-the-financialization-of-the-economy/#4f6e026d5783>; Christine Emba, *Has Our Economy Become Too ‘Financialized’*, THE WASHINGTON POST (April 18, 2016), https://www.washingtonpost.com/news/in-theory/wp/2016/04/18/has-our-economy-become-too-financialized/?noredirect=on&utm_term=.58e2b4e180b8; Apostolos Fasianos, Diego Guevara, & Christos Pierros, *Have We Been Here Before? Phases of Financialization within the 20th Century in the United States*, LEVY ECONOMICS INSTITUTE, WORKING PAPERS SERIES 869 (June 27, 2016), available at <https://ssrn.com/abstract=2801088>; RANA FOROOHAR, *MAKERS AND TAKERS: THE RISE OF FINANCE AND THE FALL OF AMERICAN BUSINESSES* (1st ed. 2016); Robin Greenwood & David Scharfstein, *The Growth of Finance*, 27(2) JOURNAL OF ECONOMIC PERSPECTIVES 3 (2013); Jeremy Greenwood, Juan Sanchez & Chen Wang, *Financing Development: The Role of Information Costs*, 100(4) AMERICAN ECONOMIC REVIEW 1875 (2010); Eckhard Hein, *Finance-Dominated Capitalism and Redistribution of Income: A Kaleckian Perspective*, LEVY ECONOMICS INSTITUTE, WORKING PAPER NO. 746 (January 10, 2013), available at <https://ssrn.com/abstract=2198919>; Mike Konczal & Neil Abernathy, *Defining Financialization*, ROOSEVELT INSTITUTE (July 27, 2015), <http://rooseveltinstitute.org/defining-financialization/>; Greta R. Krippner, *The Financialization of the American Economy*, 3 SOCIO-ECONOMIC REVIEW 173 (2005); Lawrence E. Mitchell, *Financialism A (Very) Brief History*, 43 CREIGHTON L. REV. 323 (2010); Ratna Sahay et al. *Rethinking Financial Deepening: Stability and Growth in Emerging Markets*, IMF STAFF DISCUSSION NOTE (May 2015); 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); Lord Adair Turner, et al. *The Future of Finance: The LSE Report*, LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE (2010); Charles J. Whalen, *Understanding Financialization: Standing on the Shoulders of Minsky*, LEVY ECONOMICS INSTITUTE, WORKING PAPERS SERIES NO. 892 (June 22, 2017), available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2991096.

¹⁰⁸ See Dan Awrey, *Toward a Supply-Side Theory of Financial Innovation*, OXFORD LEGAL STUDIES RESEARCH PAPER NO. 44/2012 (June 27, 2012), available at <https://ssrn.com/abstract=2094254>.

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,¹¹⁰ the modern ETF first began trading on the Toronto Stock Exchange in 1990.¹¹¹ 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 500.¹¹² 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 traded the S&P 500).¹¹³ 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.¹¹⁴

Investor-Driven, *supra* note 81 (for a discussion of demand factors in financial innovation including the influence of regulation on financial product innovation); *see also* Anastasia Nesvetailova, *The Crisis of Invented Money: Liquidity Illusion and the Global Credit Meltdown*, 11 THEORETICAL INQUIRIES L. 125, 132-133 (2010).

¹¹⁰ *See* VANGUARD, *What is the history of ETFs?*

https://advisors.vanguard.com/VGApp/iip/site/advisor/etfcenter/article/ETF_HistoryOfETFs (last visited June 1, 2019).

¹¹¹ The fund was called “TIPs 35” and it tracked the Toronto Stock Exchange 35 Index. *See* Stephen D. Simpson, *A Brief History of Exchange Traded Funds*, INVESTOPEDIA (October 11, 2018), <https://www.investopedia.com/articles/exchangetradedfunds/12/brief-history-exchange-traded-funds.asp>.

¹¹² *Id.*

¹¹³ *Id.*

¹¹⁴ *See* Laurent Deville, *Exchange Traded Funds: History, Trading and Research*, in C. ZOPOUNIDIS, M. DOUMPOS, P. PARDALOS ED. HANDBOOK OF FINANCIAL ENGINEERING, SPRINGER, 1-37, 4 (2008). (“These synthetic instruments were aimed at replicating the performance of the S&P 500 index, among others, but they had characteristics similar to those of futures contracts. Despite significant interest from investors, IPS had to stop trading after the lawsuit by the Chicago Mercantile Exchange and the Commodity Futures Trading Commission (CFTC) was won. As futures contracts, IPS had to be traded on a futures exchange regulated by the CFTC.”)

b. ETF Operational Ecosystem, Participant Incentives and Market Concentration

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.

¹¹⁸ See BLACKROCK, *A Primer on ETF Primary Trading and the Role of Authorized Participants* (March 2017), 3, available at <https://www.blackrock.com/corporate/literature/whitepaper/viewpoint-etf-primary-trading-role-of-authorized-participants-march-2017.pdf> (BlackRock lists the following examples of “Common U.S. APs” as “Bank of America Merrill Lynch, Citigroup, Credit Suisse, Deutsche Bank, Goldman Sachs & Co., Jeffries, JP Morgan, KCG, Morgan Stanley, UBS Securities, Virtu.”)

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.¹²⁵ Institutional clients can also trade them in *alternative trading systems* and *dark pools*, and they have become a preferred vehicle of HF trading and algorithmic trading programs.¹²⁶

Supply and demand for new ETF creations (or redemptions) originates in the secondary market, based on buy/sell order “imbalances.”¹²⁷ APs are incentivized to transact with fund sponsors through arbitrage opportunities (explained below).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).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.¹³⁰ APs exclusively interact with the fund (the only participants in the ETF ecosystem to do so).¹³¹ This right is granted when an AP enters into an *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.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.¹³³ In this regard, APs have been described as a “provider of technology” in the ETF share creation and redemption process.¹³⁴

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

¹²⁵ See BIS ETF Study, *supra* note 75 at 2.

¹²⁶ See Drew Voros, *High-Frequency Trading Key to ETFs*, ETF.COM (September 25, 2013), <https://www.etf.com/sections/features/19955-high-frequency-trading-key-to-etfs.html>.

¹²⁷ Blackrock, A Primer, *supra* note 118 at 2; see also Hu & Morley, *A Regulatory Framework*, *supra* note 75 at 852.

¹²⁸ Blackrock, A Primer, *supra* note 118 at 2.

¹²⁹ *Id.* at 3.

¹³⁰ *Id.*; see also Hu & Morley, *A Regulatory Framework*, *supra* note 75 at 852.

¹³¹ See Antoniewicz & Heinrichs, *supra* note 119 at 1.

¹³² *Id.*; see also Hu & Morley, *A Welcome Invitation*, *supra* note 75 at 1196-1197.

¹³³ Antoniewicz & Heinrichs, *supra* note 119 at 2.

¹³⁴ See Blackrock, A Primer, *supra* note 118 at 2.

¹³⁵ See Hu & Morley, *A Regulatory Framework*, *supra* note 75 at 843; see also Su, *supra*, note 69 at 6;

“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.”¹³⁶ 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.¹³⁷ 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.¹³⁸ Effective arbitrage (which relies on the voluntary actions of APs) is a fundamental regulatory consideration in the SEC’s ETF approval process.¹³⁹

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.¹⁴⁰ An expanding number of institutional investors now hold ETFs.¹⁴¹ The limits of ETF product variety seem unbounded,¹⁴² and new products cover nearly every sector, with firms looking to replicate profit opportunities frequently copying new ideas.¹⁴³ Recently ETFs have been created that follow (and track) newly financialized sectors, ideas, or strategies - for example there are ETFs on “women in leadership.”¹⁴⁴ 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.

¹³⁹ *See* Hu & Morley, *A Welcome Invitation*, *supra* note 75 at 1159-1160, 1194-1195; *see also* U.S. SECURITIES & EXCHANGE COMMISSION, *Proposed Rule 6c-11*, <https://www.sec.gov/rules/proposed/2018/33-10515.pdf>.

¹⁴⁰ *See* Vanguard, *supra* note 110.

¹⁴¹ *See* Max Chen, *Institutional ETF Ownership Steadily On The Rise*, ETF TRENDS (August 2, 2018), <https://www.etftrends.com/smart-beta-channel/institutional-etf-ownership-steadily-on-rise/>.

¹⁴² *See* Hu & Morley, *A Welcome Invitation*, *supra* note 75 at 1157-1158.

¹⁴³ *See* THE ECONOMIST, *Special Report: Exchange Traded Funds, From Vanilla To Rocky Road The Darwinian Evolution of Exchange Traded Funds* (February 25th, 2012), <https://www.economist.com/special-report/2012/02/25/from-vanilla-to-rocky-road>.

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,¹⁴⁵ consumer discretionary products,¹⁴⁶ and commodity factoring.¹⁴⁷ It also includes trading or operational strategies like leveraged products,¹⁴⁸ synthetics,¹⁴⁹ directional (inverse funds).¹⁵⁰ As such, the number of available products have grown exponentially.¹⁵¹

Some believe that “all new fund launches in 15 years” will be ETFs, thus effectively eliminating the mutual fund structure.¹⁵² A recent estimate suggests 61-times worldwide growth in ETPs (of which ETFs comprise the vast majority) since 2000.¹⁵³ *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.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

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-etf-focused-on-video-gaming-esport/>.

¹⁴⁶ See NASDAQ, *Should You Invest In The First Trust Consumer Discretionary AlphaDEX Fund (FXD)* (November 8, 2018), <https://www.nasdaq.com/article/should-you-invest-in-the-first-trust-consumer-discretionary-alphadex-fund-fxd-cm1052437>.

¹⁴⁷ See BUSINESS WIRE, *Blackrock Intends To Launch Factor-Based Commodities Exchange Traded Products* (Sept. 2, 2018), <https://www.businesswire.com/news/home/20181102005352/en/BlackRock-Intends-Launch-Factor-based-Commodities-Exchange-Traded-Products>.

¹⁴⁸ See Kate Stalter, *Why That Leveraged ETF Is A Bad Idea*, FORBES (January 23, 2017), <https://www.forbes.com/sites/katestalter/2017/01/23/why-that-leveraged-etf-is-a-bad-idea/#452495e66ed2>.

¹⁴⁹ See Sirio Aramonte, Cecilia Caglio & Tugkan Tuzun, *Synthetic ETFs*, FEDS NOTES, WASHINGTON: BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM (August 10, 2017), available at <https://doi.org/10.17016/2380-7172.2028>.

¹⁵⁰ See Rachel Evans, & Carolina Wilson, *Is This The Markets Latest Problem Child?* BLOOMBERG (February 8, 2018), <https://www.bloomberg.com/news/articles/2018-02-08/spotlight-turns-to-etf-problem-children-after-volatility-blow-up>.

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.”)

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>.

¹⁵³ *Su supra* note 69 at 1.

¹⁵⁴ See Evans & Wilson, *supra* note 63.

comprise the largest share).¹⁵⁵ Given their popularity, and post-GFC rapid growth,¹⁵⁶ 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 trades¹⁵⁷ (with enhanced liquidity over mutual funds)¹⁵⁸, instant diversification,¹⁵⁹ “operational simplicity”¹⁶⁰ and tax advantages.¹⁶¹ Thus they are largely an upgrade from mutual funds.¹⁶² Perhaps most compelling is that net of fees, and over a ten-year time period, passive funds routinely outperform actively managed funds.¹⁶³ 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.¹⁶⁴ Also contributing to growth is the “viral” replication potential for profitable structures.¹⁶⁵ ETFs can also act as an “alternative to futures” while generating similar benefits,¹⁶⁶ 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.”)

¹⁵⁷ See INVESTOPEDIA, *Advantages and Disadvantages of ETFs*, <https://www.investopedia.com/articles/exchangetradedfunds/11/advantages-disadvantages-etfs.asp> (last visited January 12, 2019).

¹⁵⁸ See Judge, *Investor-Driven*, *supra* note 37 at 328.

¹⁵⁹ The benefits of portfolio diversification in ETFs can be derived from the establishment of “Modern Portfolio Theory” by Harry Markowitz, Merton Miller and William Sharpe. See BlackRock, *Index Investing and Common Ownership Theories*, VIEWPOINT (March 2017), 4, available at <https://www.blackrock.com/corporate/literature/whitepaper/viewpoint-index-investing-and-common-ownership-theories-eng-march.pdf>.

¹⁶⁰ *Id.* at 5.

¹⁶¹ See BARRON’S, “What Makes ETFs Tax Efficient?” (April 27, 2017), <https://www.barrons.com/articles/sponsored/what-makes-etfs-tax-efficient-1493223526>; see also ETF.com, *Why Are ETFs So Tax Efficient?* <https://www.etf.com/etf-education-center/21017-why-are-etfs-transparent-and-tax-efficient.html> (last visited January 12, 2019).

¹⁶² See Ryan Vlastelica, *ETFs shattered their growth records in 2017*, MARKETWATCH (January 3, 2018), <https://www.marketwatch.com/story/etfs-shattered-their-growth-records-in-2017-2017-12-11>.

¹⁶³ See Tom Anderson, *Investors Say ‘Forget It’ to Active Funds*, CNBC (August 29, 2016), <https://www.cnbc.com/2016/08/29/investors-say-forget-it-to-active-funds.html>.

¹⁶⁴ See Evans & Wilson, *supra* note 63.

¹⁶⁵ See THE ECONOMIST, *Exchange-Traded Funds Become Too Specialized* (April 27, 2017), <https://www.economist.com/finance-and-economics/2017/04/27/exchange-traded-funds-become-too-specialised>.

¹⁶⁶ See Nancy B. Nichols, William M Vandenberg & Luis Betancourt, *Taxing Implications of Exchange Traded Funds*, 85 PRACTICAL TAX STRATEGIES 109,110 (2010).

precious metals and higher-yield fixed income products, as well as inverse and leveraged exposure.¹⁶⁷

d. Why Liquidity Matters in Investment Products

Liquidity costs are often both “underestimated”¹⁶⁸ and “underappreciated.”¹⁶⁹ Liquidity captures the “ease” at which an asset can be “converted” into cash and thereby facilitate a “consumption” activity.¹⁷⁰ Importantly, liquidity measures the extent that a security can be traded without affecting its price.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.¹⁷² The “bid-ask spread” has been described as a “simple measure of market liquidity.”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.¹⁷⁴ This was not the case, however, for ETFs holding certain fixed income products and bonds.¹⁷⁵

As witnessed in the GFC, liquidity shortages can be devastating.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

¹⁶⁷ See *id.* at 112-114.

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.”)

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.”)

¹⁷⁰ Aleksander Berentsen, Samuel Huber & Alessandro Marchesiani, *Free-riding on Liquidity*, UNIVERSITY OF ZURICH WORKING PAPER NO. 32 (September 2011), 2.

¹⁷¹ See INVESTOPEDIA, *Liquidity*, <https://www.investopedia.com/terms/l/liquidity.asp> (last June 14, 2019).

¹⁷² See Su, *supra* note 69 at 4-5.

¹⁷³ See Deutsche Bundesbank ETF Report, *supra* note 104 at 89-91.

¹⁷⁴ *Id.*

¹⁷⁵ *Id.* at 90.

¹⁷⁶ See Su, *supra* note 69 at 4-5.

ETF trading ecosystem.¹⁷⁷ It is impossible to predict the next crisis, but liquidity shortages in the ETF market could magnify a crisis fallout.¹⁷⁸ 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.¹⁷⁹

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.¹⁸⁰ These concerns have been identified recently in a variety of reports including by the *International Monetary Fund* (IMF),¹⁸¹ the *Financial Stability Board* (FSB),¹⁸² and the Central Bank of Germany (*Deutsche Bundesbank*).¹⁸³

¹⁷⁷ *Id.*

¹⁷⁸ See Satyajit Das, *Scarce Liquidity is a Growing Risk*, BLOOMBERG (June 12, 2018), <https://www.bloomberg.com/opinion/articles/2018-06-12/scarce-liquidity-is-a-growing-risk>.

¹⁷⁹ See Riza Demirer, Karyl Leggio & Donald Lien, *Herding and Flash Events: Evidence From the 2010 Flash Crash*, FINANCE RESEARCH LETTERS (December 26, 2018), 3, available at <https://ssrn.com/abstract=3263881>.

¹⁸⁰ See Deutsche Bundesbank ETF Report, *supra* note 104 at 93-97.

¹⁸¹ See INTERNATIONAL MONETARY FUND, *Global Financial Stability Report*, April 2019, 50, available at <https://www.imf.org/en/Publications/GFSR/Issues/2019/03/27/Global-Financial-Stability-Report-April-2019>.

¹⁸² See FINANCIAL STABILITY BOARD, *Policy Recommendations To Address Structural Vulnerabilities From Asset Management Activities* (January 12, 2017), 11-24, available at <https://www.fsb.org/wp-content/uploads/FSB-Policy-Recommendations-on-Asset-Management-Structural-Vulnerabilities.pdf>.

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 devaluating) 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 prophecy” 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

¹⁸⁴ See Vesna Poljak, *Fund Managers Believe Exchange Traded Funds Will Have A Role In The Next Crisis*, FINANCIAL REVIEW (Oct. 22, 2017), <https://www.afr.com/markets/fund-managers-believe-etfs-will-have-a-role-in-the-next-crisis-20171021-gz5oay>.

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.”)

¹⁸⁷ See Natasha Doff, *Hedge Fund Manager Stakes Own Cash on a Bet Against Credit ETFs*, BLOOMBERG (November 5, 2018), <https://www.bloomberg.com/news/articles/2018-11-05/hedge-fund-manager-stakes-own-cash-betting-credit-etfs-crumble>.

¹⁸⁸ *Id.*

¹⁸⁹ *Id.*

¹⁹⁰ *Id.*

¹⁹¹ Joanna Ossinger, *JPMorgan Says ETFs Won’t Be The Biggest Victims If Credit Blows Up*, BLOOMBERG (November 9, 2018), <https://www.bloomberg.com/news/articles/2018-11-09/jpmorgan-says-etfs-won-t-be-biggest-victims-if-credit-blows-up>.

compensation for the enhanced volatility “pricing error.”¹⁹² In anticipation of liquidity shortages other fund managers have started devising option strategies to profit from flash crashes.¹⁹³

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.¹⁹⁴ Secondary market liquidity providers (like high frequency traders (HF traders)) could back out of the market, leaving ETF investors with illiquid securities.¹⁹⁵ 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.¹⁹⁶

This is the essence of the “illusion” of liquidity when ETFs are comprised of illiquid underlying securities.¹⁹⁷ Liquidity in a ETF that holds illiquid assets is contingent on an “intervening mechanism that allows participants to arb away disconnects.”¹⁹⁸ 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.¹⁹⁹

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

¹⁹² See FINANCIAL STABILITY OVERSIGHT COUNCIL, *Update on Review of Asset Management Products and Activities* (November 16, 2016) available at, <https://www.treasury.gov/initiatives/fsoc/news/Documents/FSOC%20Update%20on%20Review%20of%20Asset%20Management%20Products%20and%20Activities.pdf>.

¹⁹³ See Cecile Gutscher & Jakob Peterseil, *The Liquidity ‘Illusion’ Has These Funds Making Plans for a Stock Doomsday*, BLOOMBERG (April 10, 2019), <https://www.bloomberg.com/news/articles/2019-04-10/liquidity-illusion-has-these-funds-making-stock-doomsday-plans>.

¹⁹⁴ See Mike Bird, *Could ETFs Fall Into A Liquidity Jam?* THE WALL STREET JOURNAL (March 21, 2018), https://www.wsj.com/articles/return-of-volatility-raises-liquidity-question-for-etfs-1521627574?mod=ITP_businessandfinance_0&tesla=y.

¹⁹⁵ See Joseph N. DiStefano, *Will ETFs, their prices dependent on hedge fund billions, stay aligned in the next market panic?* MINNESOTA POST BULLETIN (November 28, 2018), https://www.postbulletin.com/news/business/will-etfs-their-prices-dependent-on-hedge-fund-billions-stay/article_af7bd54e-0ede-57c9-a3df-6a2308bcb93b.html.

¹⁹⁶ See David Thorpe, *ETF Investors ‘Must Accept’ Liquidity Risk*, FT ADVISOR (November 8, 2018), <https://www.ftadviser.com/investments/2018/11/08/etf-investors-must-accept-liquidity-risk/>.

¹⁹⁷ See David Tuckwell, *Junk Bond ETFs are Being Sold Short En Masse*, ETF STREAM (February 18, 2018), http://www.etfstream.com/data-snapshot/2955_junk-bond-etfs-are-being-short-sold-en-masse.

¹⁹⁸ SEEKING ALPHA, *Presenting: The ‘New’ Doom Loop* (February 20, 2018), <https://seekingalpha.com/article/4148271-presenting-new-doom-loop>.

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 funds²⁰⁴ 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

²⁰⁰ See BIS ETF Study, *supra* note 75 at 1.

²⁰¹ See Stephen Gandel, *The Market Time Bomb That’s Bigger Than The Vix*, BLOOMBERG BUSINESSWEEK (February 7, 2018), <https://www.bloomberg.com/news/articles/2018-02-07/there-s-a-time-bomb-bigger-than-the-vix-in-the-market>.

²⁰² Matt Levine, *CEOs Still Don’t Like Short-Termism*, BLOOMBERG OPINION (June 7, 2018), <https://www.bloomberg.com/opinion/articles/2018-06-07/ceos-still-don-t-like-short-termism>.

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-etfs-are-on-track-to-reach-1-trillion-mark-by-the-end-of-the-year-11556726577/>.

²⁰⁴ See Wolf Richter, *Treacherous Times For Bond Funds Ahead*, WOLF STREET (November 29, 2018), <https://wolfstreet.com/2018/11/29/potentially-treacherous-times-for-bond-funds-ahead/>.

²⁰⁵ See Lee Barney, *Fixed-Income ETFs Used To Address Bond Market Issues*, PLAN SPONSOR (September 19, 2018), <https://www.plansponsor.com/fixed-income-etfs-used-address-bond-market-issues/>; see also Hu & Morley, *A Commendable Start*, *supra* note 15 at 1158; Henry T.C. Hu & John Morley, *A Regulatory Framework*, *supra* note 75 at 843.

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 2018.²⁰⁷ This concern has also been recently noted for ETFs that invest in leveraged loans and mortgages.²⁰⁸

Fixed income ETFs allow for instant access to a market that is otherwise difficult to obtain exposure.²⁰⁹ They are “attractive to retail investors” because of the secondary market liquidity for a generally illiquid underlying asset class.²¹⁰ It also triggers a risk of a “negative feedback loop” as previously described.²¹¹ 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).²¹² 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.”²¹³

ETF liquidity is reliant on MMs and APs who have market-based incentives and are not contractually obligated to provide liquidity. The APAs²¹⁴ that APs enter into with ETF sponsors don’t provide compensation to the AP

²⁰⁷ See MARKETWATCH, *Fixed Income ETF Volume Surged In 2018* (January 15, 2019), <https://www.marketwatch.com/story/fixed-income-etf-volume-surged-in-2018-2019-01-15-12461728>.

²⁰⁸ See Colby Smith, *Who’s Buying Leveraged Loans Anyways?* FINANCIAL TIMES (November 20, 2018), <https://ftalphaville.ft.com/2018/11/20/1542706123000/Who-s-buying-leveraged-loans-anyways-/>.

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-808d194ffb75>.

²¹⁰ See Daniel Zwirn, 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*, unpublished manuscript (April 29, 2019), available at SSRN: <https://ssrn.com/abstract=3379979>.

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.*

²¹³ Randall W. Forsyth, *Corporate Credit Could Be The Next Bubble To Burst*, BARRON’S (February 15, 2019), <https://www.barrons.com/articles/debt-be-not-proud-danger-in-the-complacency-about-corporate-credit-51550248974>.

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.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.”²¹⁶ Most importantly, an AP does not have a legal (or fiduciary) obligation to create or redeem ETF shares²¹⁷, and an individual ETF sponsor will enter into many APAs with various APs with large funds having the most agreements in place.²¹⁸

c. Liquidity Wrappers and Market Completion Theory

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

²¹⁵ See Mara Shreck & Shelly Antoniewicz, *ETF Basics: The Creation and Redemption Process And Why It Matters*, ICI VIEWPOINT (January 19, 2012), https://www.ici.org/viewpoints/view_12_etfbasics_creation.

²¹⁶ See Antoniewicz & Heinrichs, *supra* note 119 at 1.

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

²¹⁸ See Antoniewicz & Heinrichs, *supra* note 119 at 2-4.

²¹⁹ See Garth Friesen, *ETFs Won't Cause The Next Wave of Panic Selling In The Bond Market*, FORBES (August 14, 2018), <https://www.forbes.com/sites/garthfriesen/2018/08/14/etfs-wont-cause-the-next-wave-of-panic-selling-in-the-bond-market/#5ef918c75ce6>.

²²⁰ See Su, *supra* note 69 at 6.

²²¹ *Id.* at 10.

²²² For a discussion of investor demand factors in financial product innovation see Dan Awrey, *Complexity, Innovation, and the Regulation of Modern Financial Markets*, 2 HARV. BUS. L. REV. 235, 260-267 (2012).

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).

²²⁴ See Awrey, *Toward A Supply Side*, *supra* note 108.

firms use innovation to pursue profit opportunities²²⁵ has gained prominence post-GFC.²²⁶ 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.²²⁷

Liquidity enhancement as a justification for financial innovation is derived from the "market completion theory" (MCT)²²⁸ Under this theory, economic risk is managed through the creation of financial products that are optimally distributed to capable risk bearers.²²⁹ 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.²³⁰ Relying on Minsky she posits that liquidity is contingent on the characteristics of tradeable assets, not MCT from financial innovation.²³¹ Her assertions rely on Minsky's idea that economic tranquility facilitates instability by fostering a "complex hierarchy of financial commitments"²³² and that periods of prosperity create an "underestimation of risks"²³³ when creating and trading financial products including liquidity that is "assumed but never guaranteed" like during the GFC in mortgage-backed securities.²³⁴

The seemingly endless possibilities of ETF innovation cause one to wonder whether markets will ever be fully "complete."²³⁵ A recent study by Professors Kevin Pan and Yao Zeng casts additional doubt on ETFs as a demand-

²²⁵ See Hyman P. Minsky, *The Financial Instability Hypothesis*, LEVY ECONOMICS INSTITUTE OF BARD COLLEGE WORKING PAPER NO. 74 (May 1992).

²²⁶ See Eugenio Caverzasi, *Minsky and the Subprime Mortgage Crisis: The Financial Instability Hypothesis in the Era of Financialization*, LEVY ECONOMICS INSTITUTE, WORKING PAPER NO. 796 (April 28, 2014), available at <https://ssrn.com/abstract=2430259>.

²²⁷ See Minsky, *supra* note 225 at 6. See also Nesvetailova, *supra* note 109 at 127.

²²⁸ See Kenneth J. Arrow, *The Role of Securities in the Optimal Allocation of Riskbearing*, 31 REV. ECON. STUD. 91, 91-96 (1964); and Kenneth J. Arrow & Gerard Debreu, *Existence of an Equilibrium for a Competitive Economy*, 22 ECONOMETRICA 265, 265-66 (1954); Robert C. Merton, *Financial Innovation and Economic Performance*, J. APPLIED CORP. FIN. (1992); See Nesvetailova, *supra* note 109.

²²⁹ See Nesvetailova, *supra* note 109 at 132-133.

²³⁰ *Id.*

²³¹ *Id.*

²³² *Id.* at 136.

²³³ *Id.*

²³⁴ *Id.* at 138

²³⁵ See generally Alan Greenspan, Chairman, Fed. Reserve, Corporate Governance (May 8, 2003) (speech delivered at the Conference on Bank Structure and Competition), available at <http://www.federalreserve.gov/BOARDDOCS/SPEECHES/2003> ("financial innovation will slow as we approach the world in which financial markets are complete in the sense that all financial risks can be effectively transferred to those most willing to bear them.")

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.²³⁶ The study notes, “AP arbitrage indeed becomes less effective or even fragile when liquidity mismatch becomes more significant.”²³⁷ Further, when acting in dual roles, ETF arbitrageurs can use primary market redemptions and creations to “unwind their bond inventory imbalances.”²³⁸

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.²³⁹ 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.²⁴⁰ 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.²⁴¹

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 (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.²⁴² 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.²⁴³ 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.”²⁴⁴

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)²⁴⁵ pursuant to sections 2(a)(32) and 5(a)(1) the *Investment Company Act* governing “open-end management investment companies.”²⁴⁶ 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.²⁴⁷

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

²⁴² See Faid Abdel Massih, Ana Arsov, *Financial Institutions – Global: ETFs Track Liquidity Risk on Top of Asset Performance*, MOODY’S INVESTOR SERVICE RESEARCH REPORT (May 9, 2019), available at https://www.moodys.com/research/Moodys-ETFs-ability-to-weather-liquidity-risk-governed-by-its--PBC_1174986.

²⁴³ *Id.* See also Rachel Evans, *ETFs Threaten to ‘Amplify’ Systemic Risk When Liquidity Dries Up*, BLOOMBERG (May 9, 2019), <https://www.bloomberg.com/news/articles/2019-05-09/etfs-threaten-to-amplify-systemic-risk-when-liquidity-dries-up>.

²⁴⁴ Evans, *supra* note 243.

²⁴⁵ See John Morley, *The Separation of Funds and Managers: A Theory of Investment Fund Structure and Regulation*, 123 YALE L.J. 1228 (2013).

²⁴⁶ 15 U.S.C. §§ 80a-2(a)(32), 5(a)(1) (2012).

²⁴⁷ See Kuhu Parasrampur, *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.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.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.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.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.²⁵² Maker rebates are “enhanced” for lead market makers (LMM) who take on additional quoting obligations.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.²⁵⁴ The NYSE ARCA is the

²⁴⁸ See Hu & Morley, *A Regulatory Framework*, *supra* note 75 at 873.

²⁴⁹ See CBI Discussion Paper, *supra* note 75.

²⁵⁰ See Hu & Morley, *supra* note 75 at 1194-1195.

²⁵¹ See Stanislav Dolgoplov, *A Two-Sided Loyalty? Exploring The Boundaries of Fiduciary Duties of Market Makers*, 12 U.C. DAVIS BUS. L.J. 31,32 (2011) (hereinafter “Dolgoplov Two-Sided”); see also Hu & Morley, *supra* note 75 at 1195.

²⁵² See Andrew Bloomenthal, *What Maker-Taker Fees Mean To You*, INVESTOPEDIA (March 1, 2018), <https://www.investopedia.com/articles/active-trading/042414/what-makertaker-fees-mean-you.asp>.

²⁵³ See Phil Bak, *The Big Systemic Market Structure ETF Risk That No One Is Talking About*, THINKADVISOR (March 30, 2018), <https://www.thinkadvisor.com/2018/03/30/the-big-systemic-market-structure-etf-risk-that-no-one-is-talking-about/?slreturn=20190106213320>; see also NYSE ARCA, Market Making, https://www.nyse.com/publicdocs/nyse/markets/liquidity-programs/arca_mm_orientation.pdf (last visited February 7, 2019).

²⁵⁴ See ETF.COM, *Who are Market Makers and What is Step-Away Trading?* <https://www.etf.com/etf-education-center/21020-who-are-market-makers-and-what-is-step-away-trading.html> (last visited February 6, 2019).

top U.S. exchange for ETF trading with over 22% market share in U.S. trading volume.²⁵⁵ ETFs also trade on *Alternative Trading Systems* (ATS), although at a reduced volume.²⁵⁶

The MM industry has experienced some strain in recent years,²⁵⁷ and a digital-reiteration driven by the emergence of HF trading algorithms (often called “informal liquidity providers.”)²⁵⁸ HF trading is a major player in providing liquidity in ETFs.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.”²⁶⁰

The robustness of ETF liquidity provision by HFT in a crisis is uncertain.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”).²⁶² HF trading has been criticized as disrupting the price discovery function²⁶³ and reducing the incentives of informed traders because of their

²⁵⁵ See BUSINESS WIRE, *NYSE Arca Remains Leading Exchange for ETFs in 2017* (January 10, 2018), <https://www.businesswire.com/news/home/20180110005309/en/>.

²⁵⁶ See Laura Tuttle, *Alternative Trading Systems: Description of ATS Trading in National Market System Stocks*, SEC DIVISION OF ECONOMIC AND RISK ANALYSIS MEMORANDUM (October 2013) 2, available at <https://www.sec.gov/marketstructure/research/alternative-trading-systems-march-2014.pdf>

²⁵⁷ See Stanislav Dolgoplov, *Regulating Merchants of Liquidity: Market Making From Crowded Floors to High Frequency Trading*, 18 U. PA. J. BUS. L. 651, 658 (2016).

²⁵⁸ *Id.* at 659.

²⁵⁹ See Larry Swedroe, *High Frequency Trading’s Impact*, ETF.com (February 24, 2016), <https://www.etf.com/sections/index-investor-corner/swedroe-high-frequency-tradings-impact?nopaging=1>.

²⁶⁰ See Jennifer Victoria Christine Dean, *Paradigm Shifts & Unintended Consequences: The Death of the Specialists, The Rise of High Frequency Trading & the Problem of Duty-Free Liquidity in Equity Markets*, 8 FIU L. REV. 217, 261 (2012).

²⁶¹ See Dolgoplov, *Regulating*, *supra* note 257 at 693; see also Vikas Raman et al., *Electronic Market Makers, Trader Anonymity and Market Fragility* (Dec 1, 2012) (unpublished manuscript), available at <http://ssrn.com/abstract=2445223>.

²⁶² See Dolgoplov, *Regulating*, *supra* note 257 at 699.

²⁶³ See Joseph E. Stiglitz, *Tapping the Brakes: Are Less Active Markets Safer and Better for the Economy?* 7 (Apr. 2014)(unpublished manuscript) (on file with the Federal Reserve Bank of Atlanta), available at

<http://www.frbatlanta.org/documents/news/conferences/14fmc/Stiglitz.pdf>; see also Andrew Haldane, *Patience and Finance: SPEECH AT THE OXFORD CHINA BUSINESS FORUM* (Sept. 9, 2010), available at <http://www.bis.org/review/r100909e.pdf>; Robert A. Jarrow & Philip Protter, *A Dysfunctional Role of High Frequency Trading in Electronic Markets*, No. 08-201, JOHNSON SCH. RES. PAPER SERIES 4 (2011), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1781124; Markus Baldauf & Joshua

ability to co-locate, subscribe to market data-feeds, and obtain “early access to inside information and trading data.”²⁶⁴ 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.”²⁶⁵

Professor Stanislav Dolgoplov has noted that Federal courts have not historically imposed broad fiduciary requirements on MMs to provide liquidity to individual investors.²⁶⁶ 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.²⁶⁷ Dolgoplov 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.²⁶⁸ 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.²⁶⁹

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”²⁷⁰ - although this risk is mitigated by the micro-time horizons associated with HF trading.²⁷¹ 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

Mollner, *High-Frequency Trade and Market Performance* 3-4 STANFORD INST. FOR ECON. POL’Y RES., WORKING PAPER NO. 15-017 (2017), https://siepr.stanford.edu/sites/default/files/publications/15-017_0.pdf; Jasmin Gider et al., *High-Frequency Trading and Fundamental Price Efficiency*, FIN. RES. NETWORK, WORKING PAPER, 2016, 7-8, 26-27 <http://firn.org.au/wp-content/uploads/2016/05/High-frequency-trading-adn-fundamentalprice-efficiency-Gider-Schmickler-Westeide.pdf>.

²⁶⁴ See Gaia Balp & Giovanni Strampelli, *Preserving Capital Markets Efficiency In The High Frequency Trading Era*, 2018 U. ILL. J.L. TECH. & POL’Y 349, 403.

²⁶⁵ See U.S SECURITIES & EXCHANGE COMMISSION, CONCEPT RELEASE ON EQUITY MARKET STRUCTURE, EXCHANGE ACT RELEASE No. 61,358, 75 Fed. Reg. 3594, 3608 (Jan. 21, 2010); see also Paul G. Mahoney & Gabriel Rauterberg, *The Regulation of Trading Markets: A Survey and Evaluation*, 39 VA. LAW & ECON. RESEARCH PAPER SERIES NO. 2017-07 (2017), <https://ssrn.com/abstract=2955112>.

²⁶⁶ Dolgoplov Two-Sided, *supra* note 251 at 35-36.

²⁶⁷ *Id.* at 33-34.

²⁶⁸ *Id.* at 63.

²⁶⁹ See Stanislav Dolgoplov, *Providing Liquidity In A High-Frequency World: Trading Obligations And Privileges of Market Makers And A Private Right of Action*, 7 BROOK. J. CORP. FIN. & COM. L. 303 (2013).

²⁷⁰ See Dolgoplov, *Regulating*, *supra* note 257 at 677.

²⁷¹ *Id.* at 679.

exaggerated prices” – similar to what happened in equity index options on “Black Monday” (October 19, 1987).²⁷²

A recent study showed, using a “rational expectations equilibrium model”²⁷³ that discretionary liquidity traders – like HF traders – increase the amount of “noise trading” (trading with no valuable informational content in valuing the asset).²⁷⁴ This causes price inefficiency and a loss of “information aggregation.”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.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.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.²⁷⁸ Further, there is evidence that HF traders and other “algorithmic traders” use trading strategies that are “highly correlated.”²⁷⁹ Therefore, HF trading MMs in ETFs could generate herding risk, an “interaction risk” fully explored in Part II of this article.

e. Liquidity Shortages and Market Maker Ecosystem Participant Concentration

²⁷² Dolgoplov Two-Sided, *supra* note 251 at 35-36.

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.”)

²⁷⁴ *Id.* at 605.

²⁷⁵ *See id.*

²⁷⁶ *Id.* at 606.

²⁷⁷ *Id.*

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.”)

²⁷⁹ *See* A.P. Chaboud, B. Chiquoine, E. Hjalmarsson & C. Vega, *Rise of the Machines: Algorithmic Trading In The Foreign Exchange Market*, 69 J. FINANCE 2045 (2014).

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."²⁸⁰ Therefore a "strategic exit" or rogue behavior by a dominant MM in the ETF market could cause significant disruption.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.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.²⁸³ It's been estimated by the *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.²⁸⁴

Liquidity shortages via "concentration risk" is relevant to consider for APs, MMs 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.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.²⁸⁶

f. The ETF "Pro-Liquidity" Industry Counter-Arguments

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

²⁸⁰ Bak, *supra* note 253.

²⁸¹ *Id.*

²⁸² See Deutsche Bundesbank ETF Report, *supra* note 104 at 93; see also Hu & Morley, *A Commendable Start*, *supra* note 75 at 1196.

²⁸³ *Id.* at 94.

²⁸⁴ See Deutsche Bundesbank ETF Report, *supra* note 104 at 93. see also G. Turner & V. Sushko, *What risks do exchange- traded funds pose*, BANQUE DE FRANCE, FINANCIAL STABILITY REVIEW, No 22 (April 2018).

²⁸⁵ See Deutsche Bundesbank ETF Report, *supra* note 104; see also 13D Research, *The ETF Liquidity Question: Can The Passive Universe Hold Up In The Event of a Market Crisis?* MEDIUM (December 13, 2018), <https://latest.13d.com/etf-market-crisis-qe-liquidity-passive-investing-6af295f4e667>.

²⁸⁶ 13D Research, *id.*

²⁸⁷ See Trevor Hunnicutt, *Fund Industry Defends Bond ETFs to U.S. Regulators*, REUTERS (April 9, 2018), <https://www.reuters.com/article/us-usa-sec-bonds/fund-industry-defends-bond-etfs-to-u-s-regulators-idUSKBN1HG2YZ>.

APs will replace those who withdraw during a crisis.²⁸⁸ *BlackRock* (who clearly benefits from a stable market perception), is adamant that these purported risks are overblown – even non-existent.²⁸⁹ Liquidity illusions have also been identified as potentially forming in equity ETFs²⁹⁰ 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.²⁹¹

BlackRock refutes these studies, stating that they use assumptions not indicative of “historic behavior of investors or ETFs.”²⁹² They also suggest that widespread AP pullout is highly unlikely because other APs would scoop up the arbitrage opportunity for profit.²⁹³ This trust in APs to step in and mitigate a liquidity crisis has been cited by other industry participants.²⁹⁴ APs have previously withdrawn momentarily from providing liquidity (the case of *Knight Trading Group* in 2012, and *Citigroup* in 2013) and alternative APs and MMs responded.²⁹⁵ *BlackRock* has noted that secondary trading volume is much greater than primary market trading volume in a given fund’s underlying securities (in line with the liquidity enhancement argument previously noted).²⁹⁶ Further, the underlying bond portfolios of fixed income ETFs are becoming increasingly “standardized” which serves as an additional safeguard.²⁹⁷

²⁸⁸ See CENTRAL BANK OF IRELAND, *Feedback Statement on DP6 – Exchange Traded Funds* (2018), 11, available at <https://www.centralbank.ie/docs/default-source/publications/discussion-papers/discussion-paper-6/feedback-statement-on-exchange-traded-funds---discussion-paper-6.pdf?sfvrsn=2>.

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.

²⁹⁰ See Tautvydas Marciulaitis, *ETF Liquidity Trap Will Get You*, SEEKING ALPHA (July 26, 2017), <https://seekingalpha.com/article/4090736-etf-liquidity-trap-will-get?page=2>; see also Sonali Basak & Lananh Nguyen, *Guggenheim’s Anne Walsh Sees Liquidity Mismatch in Passive Bond Funds*, BLOOMBERG (January 30, 2018), <https://www.bloomberg.com/news/articles/2018-01-30/guggenheim-s-walsh-sees-liquidity-mismatch-in-passive-bond-funds>.

²⁹¹ See Yakob Peterseil, *BlackRock Hits Back at SocGen’s Warning About the ETF Market*, BLOOMBERG (September 11, 2018), <https://www.bloomberg.com/news/articles/2018-09-11/blackrock-hits-back-at-socgen-alarm-over-etf-market-fragility>.

²⁹² *Id.*

²⁹³ See BLACKROCK ETF Case Study, *supra* note 289 at 5-6.

²⁹⁴ See Scott Longley, *Addressing ETF Liquidity Concerns*, ETF STREAM (April 4, 2019), https://www.etfstream.com/feature/7093_addressing-etf-liquidity-concerns/.

²⁹⁵ See Antoniewicz & Heinrichs, *supra* note 119 at 8, 11; see also See OFFICE OF FINANCIAL RESEARCH, *Asset Management and Financial Stability* (September 2013), 11-12, https://www.financialresearch.gov/reports/files/ofr_asset_management_and_financial_stability.pdf.

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.²⁹⁸ Most ETFs, however, are not cash redeemable, but rather transfer the underlying securities “in-kind” to the AP²⁹⁹, and using leverage to subside a panic is a risky proposition.³⁰⁰ 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.³⁰¹ 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,³⁰² and that “the best line of defense against a liquidity mismatch” is with the ETF itself to establish prudent liquidity management tools and practices.³⁰³

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.³⁰⁴ 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

²⁹⁸ See FINANCIAL STABILITY BOARD, *Policy Recommendations To Address Structural Vulnerabilities From Asset Management Activities* (January 12, 2017), available at <http://www.fsb.org/wp-content/uploads/FSB-Policy-Recommendations-on-Asset-Management-Structural-Vulnerabilities.pdf>; see also Ashley Lau & Michael Flaherty, *ETF Companies Boost Bank Credit Lines Amid Liquidity Concern*, REUTERS (May 12, 2015), <https://www.reuters.com/article/us-etfs-credit-expansion-insight/etf-companies-boost-bank-credit-lines-amid-liquidity-concern-idUSKBN0NY0A720150513>.

²⁹⁹ See Jennifer Ryan Woods, *Experts Say Bond ETF Liquidity Concerns Are Overblow*, FORBES (May 18, 2015), <https://www.forbes.com/sites/jenniferwoods/2015/05/18/experts-say-bond-etf-liquidity-concerns-are-overblown/#38a2baa26091>.

³⁰⁰ See Bird, *supra* note 194.

³⁰¹ See RISK.NET, *Institutional ETF Trading, Liquidity Improving, Trade Sizes Growing* (Q4 2018), available at https://www.janestreet.com/static/pdfs/JaneStreet_Inst ETF_Trading_Survey_2018.pdf?utm_source=website&utm_medium=download_button&utm_campaign=trading-survey-2018; see also John Manganaro, *ETF Costs, Liquidity in Focus For Institutional Investors*, PLAN SPONSOR (October 12, 2018), <https://www.plansponsor.com/etf-costs-liquidity-focus-institutional-investors/>.

³⁰² See THE BOARD OF THE INTERNATIONAL ORGANIZATION OF SECURITIES COMMISSIONS, *Recommendations For Liquidity Risk Management For Collective Investment Schemes Final Report* (February 2018) at 23-24, available at <http://www.iosco.org/library/pubdocs/pdf/IOSCOPD590.pdf>.

³⁰³ *Id.* at 23.

³⁰⁴ See Corey Hoffstein, *Making The Case For Using ETFs to Track Illiquid Markets*, FORBES (October 6, 2016), <https://www.forbes.com/sites/greatspeculations/2016/10/06/making-the-case-for-using-etfs-to-track-illiquid-markets/#1fa3bbce7f85>.

(making an ETF a superior investment vehicle for illiquid underlying).³⁰⁵ 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.³⁰⁶ 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.³⁰⁷

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.”³⁰⁸ With an ETF you can at least sell on the secondary market and you aren’t stuck to only dealing with the fund issuer.³⁰⁹ 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.³¹⁰

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.”³¹¹ 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.*

³⁰⁸ Henry Cobbe, *Concerned About Liquidity? Stick to Bond ETFs*, SEEKING ALPHA (May 5, 2019), <https://seekingalpha.com/article/4260276-concerned-liquidity-stick-bond-etfs>.

³⁰⁹ *Id.*

³¹⁰ Evans, *supra* note 183.

³¹¹ See INTERNET ENCYCLOPEDIA OF PHILOSOPHY, *George Santayana (1863-1952)*, <https://www.iep.utm.edu/santayan/> (last visited May 15, 2019).

a. Black Monday and The Failure of Portfolio Insurance

Monday, October 19, 1987 - known to market historians as the infamous “Black Monday” crash -³¹² saw the Dow Jones Industrial Average (“DJIA”) lose over 20 percent of its value (the largest single day decline in U.S. history).³¹³ Various theories have attempted to explain what caused Black Monday including the impact of “globalization.”³¹⁴ 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.”³¹⁵ Other theories include a record number of “margin calls”³¹⁶ as well as “problems in trading systems” and “difficulty in gathering information in the rapidly changing and chaotic environment.”³¹⁷ 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.”³¹⁸ Exacerbating the fallout were certain “structural flaws” including “trade clearing protocols” in both securities and derivatives markets that were later subject to regulatory “overhaul.”³¹⁹

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

³¹² See Lewis D. Solomon & Howard B. Dicker, *The Crash of 1987: A Legal and Public Policy Analysis*, 57 *FORDHAM L. REV.* 191 (1988).

³¹³ See Troy Segal, *What Causes Black Monday: The Stock Market Crash of 1987?* INVESTOPEDIA, <https://www.investopedia.com/ask/answers/042115/what-caused-black-monday-stock-market-crash-1987.asp> (accessed April 26, 2019)

³¹⁴ *Id.*

³¹⁵ Donald Bernhardt & Marshall Eckblad, *Stock Market Crash of 1987*, FEDERAL RESERVE HISTORY, https://www.federalreservehistory.org/essays/stock_market_crash_of_1987#what (accessed April 26, 2019).

³¹⁶ Mark Carlson, *A Brief History of the 1987 Stock Market Crash With A Discussion of The Federal Reserve Response*, FINANCE AND ECONOMICS DISCUSSION SERIES, DIVISIONS OF RESEARCH AND STATISTICS AND MONETARY AFFAIRS, FEDERAL RESERVE BOARD, 2007-13, available at <https://www.federalreserve.gov/pubs/feds/2007/200713/200713pap.pdf>, at 12-14.

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.³²⁰ The *Presidential Task Force on Market Mechanisms 1988* (the “*Brady Commission*”) suggested portfolio insurance “ignited” the crisis by facilitating “mechanical price-insensitive selling.”³²¹ 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.³²² 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.”³²³ It was strategically enacted through computer modelling programs that calculated “optimal stock-to-cash ratios at various market prices.”³²⁴ 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.³²⁵ Model re-calculation and portfolio adjustment was costly, so models were updated periodically and then trading took place in “batches.”³²⁶ 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.³²⁷ However, during Black Monday, the “simultaneous” use of portfolio insurance by investors (who were

³²⁰ See Anora M. Gaudiano, *Here’s One Factor That Amplified The 1987 Stock-Market Crash*, MARKETWATCH (October 19, 2017), <https://www.marketwatch.com/story/heres-one-key-factor-that-amplified-the-1987-stock-market-crash-2017-10-16>.

³²¹ See PRESIDENTIAL TASK FORCE ON MARKET MECHANISMS (1988): REPORT OF THE PRESIDENTIAL TASK FORCE ON MARKET MECHANISMS. NICHOLAS BRADY (CHAIRMAN), U.S. GOVERNMENT PRINTING OFFICE at 7 (hereinafter “Brady Commission”).

³²² See Matt Maley, *The Real Reason For The 1987 Crash, As Told By A Salomon Brothers Veteran*, CNBC (October 16, 2017), <https://www.cnbc.com/2017/10/16/cause-of-black-monday-in-1987-as-told-by-a-trader-who-lived-through-it.html>.

³²³ Carlson, *supra* note 316 at 4.

³²⁴ *Id.*

³²⁵ See Floyd Norris, *A Computer Lesson Still Unlearned*, THE NEW YORK TIMES (October 18, 2012), <https://www.nytimes.com/2012/10/19/business/a-computer-lesson-from-1987-still-unlearned-by-wall-street.html>.

³²⁶ See B Garcia, *An Appraisal: Portfolio Insurance Could Fuel Stocks’ Fall, Critics Say*, THE WALL STREET JOURNAL (October 12, 1987), p. 43.

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.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.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.³³⁰

This created a "cascade effect"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.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.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.³³⁴ Index arbitrageurs were not active when they were needed.³³⁵ Also, opacity "abetted" the portfolio insurance crisis as many investors did not appreciate the "large number of assets" that were

³²⁸ *Id.* at 15-16.

³²⁹ Norris, *supra* note 325.

³³⁰ See Brady Commission, *supra* note 321 at 29

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.")

³³² Carlson, *supra* note 316 at 15.

³³³ See U.S. SECURITIES AND EXCHANGE COMMISSION (1988): THE OCTOBER 1987 MARKET BREAK. WASHINGTON: THE SECURITIES AND EXCHANGE COMMISSION. AT 3-14 – 3-16.

³³⁴ Norris, *supra* note 325.

³³⁵ See Carlson *supra* note 316 at 11 ("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.")

potentially affected.³³⁶ 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.”³³⁷ 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.³³⁸ Uncertainties linger about the extent that we can truly rely on risk modelling during a crisis.³³⁹ 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.³⁴⁰

A 2013 report from the *Federal Reserve Board* identified additional parallels between portfolio insurance and leveraged and inverse ETF trading.³⁴¹ 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.”³⁴² 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”).³⁴³

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.

³³⁹ See Erik F. Gerding, *The Dangers of Delegating Financial Regulation To Risk Models*, 29 No. 4 BANKING & FIN. SERVICES POL’Y REP. 1 (2010).

³⁴⁰ Doug Kass, *Financial Weapons of Mass Destruction Are Increasing*, REAL MONEY (February 23, 2019), <https://realmoney.thestreet.com/investing/stocks/kass-financial-weapons-of-mass-destruction-are-increasing-14875209>.

³⁴¹ See Tugkan Tuzun, *Are Leveraged and Inverse ETFs the New Portfolio Insurers?* FINANCE AND ECONOMICS DISCUSSION SERIES, DIVISIONS OF RESEARCH & STATISTICS AND MONETARY AFFAIRS, FEDERAL RESERVE BOARD, 2013-48 (June 13, 2013) 23-24, available at, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2340616.

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 2015³⁴⁷ 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 substitutes³⁵²) 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 auction³⁵⁴) was set with investor bids

³⁴⁴ See Daniel K. Tarullo, *Opening Remarks, Governor Daniel K. Tarullo At The Center For American Progress and Americans For Financial Reform Conference, Washington, D.C.*, BK. COMPL. GD. 3755909 (C.C.H.) 2018.

³⁴⁵ See David Min, *Understanding The Failures of Market Discipline*, 92 WASH. U. L. REV. 1421 (2015).

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

³⁴⁷ See Howard Marks, *Memo To Oaktree Clients Re: Liquidity* (March 25, 2015), available at <https://www.oaktreecapital.com/docs/default-source/memos/2015-03-25-liquidity.pdf?sfvrsn=2>.

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>.

³⁴⁹ INVESTOPEDIA, *Auction Rate Security – ARS*, <https://www.investopedia.com/terms/a/auction-rate-security.asp> (last visited November 30, 2018).

³⁵⁰ Marc L. Ross, *The ARS Debacle: The Forgotten Crisis of 2008*, CFA INSTITUTE, ENTERPRISING INVESTOR (January 31, 2017), <https://blogs.cfainstitute.org/investor/2017/01/31/the-ars-debacle-the-forgotten-crisis-of-2008/>.

³⁵¹ See Prendergast et al., *supra* note 346 at 383.

³⁵² See Jacqueline Doherty, *Auction-Rate Securities: Still Frozen In Time*, BARRON’S (March 28, 2015), <https://www.barrons.com/articles/auction-rate-securities-still-frozen-in-time-1427505026>.

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.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.³⁵⁶

During the GFC, ARS auctions failed as major financial institutions – who ran the auctions and were relied on to provide liquidity support – withdrew,³⁵⁷ leaving a wide supply of nearly worthless ARS.³⁵⁸ ARS auction failure meant there were “insufficient bidders to cover the number of securities offered for sale.”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.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.”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.³⁶² This is exactly the opposite of what happened as auction sponsors instead withdrew from the market during the crisis³⁶³ – 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 penalties³⁶⁴), and investors holding now illiquid (and devalued) securities they once thought were like cash.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.”³⁶⁶ The ARS failure resulted in

³⁵⁵ *Id.*

³⁵⁶ Prendergast et al., *supra* note 346 at 383.

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).

³⁵⁸ See Gerald J. Russello, *The Rise of the Financial Economy*, 2(3) AMERICAN AFFAIRS JOURNAL (2018), available at <https://americanaffairsjournal.org/2018/08/the-rise-of-the-financial-economy/>.

³⁵⁹ D’Silva et al. *supra* note 353 at 2.

³⁶⁰ *Id.*

³⁶¹ Prendergast et al., *supra* note 346 at 383.

³⁶² *Id.*

³⁶³ See Amod Choudhary, *Auction Rate Securities = Auction Risky Securities*, 11 DUQ. BUS. L.J. 23 (2008).

³⁶⁴ D’Silva et al. *supra* note 353 at 2.

³⁶⁵ See Ross, *supra* note 350.

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 MMs (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

³⁶⁷ See U.S. SECURITIES AND EXCHANGE COMMISSION, *Auction Rate Securities, SEC Press Releases and Related Documents Concerning Settlements*, available at <https://www.sec.gov/investor/ars.htm>.

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.³⁷¹ 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.”³⁷² 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.”³⁷³ 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.”³⁷⁴

Similarly, regulatory regimes can facilitate what Professor Richard Epstein describes as uncertain “cumulative and interactive effects.”³⁷⁵ 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.³⁷⁶ This necessitates a “public goods” analysis since, as ETFs clearly show - actions rationally undertaken by individuals can facilitate collective instability.³⁷⁷

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”

³⁷¹ See Satyajit Das, *WMD Old and New Primed For Next Financial Crisis*, BLOOMBERG OPINION (May 8, 2018), <https://www.bloomberg.com/opinion/articles/2018-05-09/wmd-old-and-new-primed-for-a-market-meltdown>.

³⁷² See Andrew G Haldane & Vasileios Madouros, SPEECH AT THE FEDERAL RESERVE BANK OF KANSAS CITY’S 366TH ECONOMIC POLICY SYMPOSIUM, “THE CHANGING POLICY LANDSCAPE”, JACKSON HOLE, WYOMING (31 August 2012), available at <https://www.bis.org/review/r120905a.pdf>.

³⁷³ *Id.*

³⁷⁴ See Hu & Morley, *A Regulatory Framework*; *supra* note 75; see also Hu & Morley, *A Welcome Invitation*, *supra* note 75.

³⁷⁵ RICHARD A. EPSTEIN, *SIMPLE RULES FOR A COMPLEX WORLD* (1st ed. 1995), 3.

³⁷⁶ See Stephen Morris & Hyun Song Shin, *Financial Regulation in a System Context*, BROOKINGS PAPERS ON ECONOMIC ACTIVITY 229 (2008).

³⁷⁷ *Id.* at 232.

effects,³⁷⁸ or facilitate economic rent seeking.³⁷⁹ 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.”³⁸⁰ Unfortunately increased regulatory complexity has certainly been the case in financial markets, and with increased regulatory complexity comes a greater potential for unintended consequences.³⁸¹ Of note, the SEC’s recent transaction fee pilot program³⁸² 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”³⁸³ has attracted recent criticism (and litigation) from several exchanges.³⁸⁴

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.³⁸⁵ Such a mechanism might reduce the “consequences of failure” associated with temporary market panics - like a sustained period of ETF arbitrage breakdown and resulting

³⁷⁸ 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.”)

³⁷⁹ 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.”)

³⁸⁰ Epstein, *supra* note 375 at 21.

³⁸¹ See Steven L. Schwarcz, *Regulating Complexity in Financial Markets*, 87 WASH U. L. REV. 211, 265 (2009).

³⁸² SEE U.S. SECURITIES AND EXCHANGE COMMISSION, TRANSACTION FEE PILOT FOR NMS STOCKS, Release No. 34-82873; File No. S7-05-18, available at <https://www.sec.gov/rules/proposed/2018/34-82873.pdf>.

³⁸³ 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.”)

³⁸⁴ See Alexander Osipovich & Dave Michaels, *Big-Three Stock Exchanges Sue SEC Over Trading-Fee Plan*, THE WALL STREET JOURNAL (February 15, 2019), https://www.wsj.com/articles/nasdaq-joins-new-york-stock-exchange-in-suing-to-block-sec-rule-11550259637?mod=hp_major_pos19.

³⁸⁵ 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.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.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.”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).³⁸⁹ This would provide a “floor” to the short-term panicked market.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).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

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.”)

³⁸⁷ See *id.* at 216.

³⁸⁸ *Id.* at 251.

³⁸⁹ *Id.* at 248-249.

³⁹⁰ *Id.* at 252.

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.³⁹⁴ 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.³⁹⁵ 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.³⁹⁶ They’ve also shown recent value as futures substitutes when liquidity thinned in derivatives markets.³⁹⁷

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.³⁹⁸ It’s also confirmed pre-COVID-19 fears that intermediaries could back away from arbitraging away price discounts in a crisis;³⁹⁹ validated prior reports

³⁹⁴ Dawn Lim & Mischa Frankl-Duval, *In Market Rout, ETFs Are Where The Action Is*, THE WALL STREET JOURNAL (March 15, 2020), <https://www.wsj.com/articles/in-market-rout-etfs-are-where-the-action-is-11584270000>.

³⁹⁵ *Id.*

³⁹⁶ See Ryan Clements, *New Funds, Familiar Fears: Do Exchange Traded Funds Make Markets Less Stable? Part I, Liquidity Illusions*, 20 HOU. BUS. & TAX L. J. 15 (2020), available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3343976.

³⁹⁷ Lim & Frankl-Duval, *supra* note 394.

³⁹⁸ See Marc Gerstein, *Why Your Supposedly Stable Fixed-Income ETF Fell Off A Cliff*, FORBES (March 23, 2020), <https://www.forbes.com/sites/marcgerstein/2020/03/23/why-your-supposedly-stable-fixed-income-etf-fell-off-a-cliff/#7a1c08bf7ba5>.

³⁹⁹ See Clements, *supra* note 396 at 34.

that ETFs are the new cash substitute;⁴⁰⁰ and shuttered a variety of ETFs that maybe shouldn't have ever existed in the first place.⁴⁰¹

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

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.⁴⁰⁴ The safety of bond ETFs proved precarious, however, when pre-COVID-19 fears of "liquidity mismatch"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).⁴⁰⁶ Unprecedented discounts also emerged in ETFs with illiquid underlying equities, like BlackRock's *iShares* MSCI Philippines ETF (EPHE) which reported a 15 percent discount to NAV on March 16th.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."⁴⁰⁸

⁴⁰⁰ See Marco Pagano, Antonio Sanchez Serrano & Josef Zechner, *Can ETFs Contribute To Systemic Risk?* REPORTS OF THE ADVISORY SCIENTIFIC COMMITTEE NO.9, EUROPEAN SYSTEMIC RISK BOARD (June 2019), 3-4, 28-29, https://www.esrb.europa.eu/pub/pdf/asc/esrb.asc190617_9_canetfscontributesystemicrisk~983ea11870.en.pdf.

⁴⁰¹ Katherine Greifeld & Brandon Kochkodin, *ETFs Liquidate at Quickest Pace Since 2017 Amid Market Turmoil*, BLOOMBERG (April 1, 2020), <https://www.bloomberg.com/news/articles/2020-04-01/etfs-liquidate-at-quickest-pace-since-2017-amid-market-turmoil>.

⁴⁰² Alexandra Scaggs, *The Fed Has Never Bought ETFs Before. Here's Why That's Changing*, BARRON'S (March 24, 2020), <https://www.barrons.com/articles/why-the-federal-reserve-is-now-buying-etfs-51585076254>.

⁴⁰³ See Ryan Clements, *Are ETFs Making Some Asset Managers Too Interconnected To Fail?* 22(4) U. PA. J. BUS. L. 722 (2020). available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3516936.

⁴⁰⁴ Lim & Frankl-Duval, *supra* note 394.

⁴⁰⁵ See Clements, *supra* note 396 at 36.

⁴⁰⁶ Lim & Frankl-Duval, *supra* note 394.

⁴⁰⁷ Lewis Braham, *Emerging Market ETF Pricing Another Victim of the Coronavirus Outbreak*, BARRON'S (March 26, 2020), <https://www.barrons.com/articles/emerging-market-etf-pricing-another-victim-of-the-coronavirus-outbreak-51585217700>.

⁴⁰⁸ Andrea Riquier, *ETFs behaving badly: 'exactly what they are supposed to do' or 'just what we feared'?* MARKETWATCH (March 28, 2020), <https://www.marketwatch.com/story/heres-how-to-think-about-the-turbulence-in-etf-pricing-and-heres-what-to-do-about-it-2020-03-27>.

Pricing discounts were widely manifest in credit ETFs, even for those with “negligible credit or term risk” like ultra short duration funds,⁴⁰⁹ while investment grade corporate credit funds were most heavily impacted.⁴¹⁰ Even the corporate bond funds of the largest ETF issuers - *BlackRock* and *Vanguard* - started “trading out of sync with their underlying assets.”⁴¹¹ 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.⁴¹²

NAV discounts are common in closed-end funds,⁴¹³ however, unlike a closed-end fund, an ETF uses a unique “arbitrage mechanism” to continuously align its trading price with its NAV.⁴¹⁴ 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),⁴¹⁵ is performed discretionarily and is motivated by market incentives, not legal obligations.⁴¹⁶ 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.⁴¹⁷

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.⁴¹⁸ 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.⁴¹⁹ This

⁴⁰⁹ See Gerstein, *supra* note 398.

⁴¹⁰ See Tom Eckett, *ETF discount concerns bubble to the surface*, ETF STREAM (March 23, 2020), https://www.etfstream.com/feature/10826_etf-discount-concerns-bubble-to-the-surface/.

⁴¹¹ See Dawn Lim, *Bond ETFs Flash Warning Signs of Growing Mismatch*, THE WALL STREET JOURNAL (March 23, 2020), <https://www.wsj.com/articles/bond-etfs-flash-warning-signs-of-growing-mismatch-11584964801>.

⁴¹² *Id.*

⁴¹³ Eckett, *supra* note 410.

⁴¹⁴ See Henry T.C. Hu & John Morley, *The SEC and Regulation of Exchange-Traded Funds: A Commendable Start and a Welcome Invitation*, 92 S. CAL. L. REV. 1155 (2019); see also see Henry T.C. Hu & John Morley, *A Regulatory Framework For Exchange Traded Funds*, 91 S. CAL. L. REV. 839 (2018).

⁴¹⁵ Gerstein, *supra* note 398.

⁴¹⁶ See Clements, *supra* note 396 at 25-28, 34-36.

⁴¹⁷ *Id.*

⁴¹⁸ Katherine Greifeld, *Fed Lifeline Saves Bond Funds Teetering on Brink of ETF Hell*, BLOOMBERG (March 28, 2020), <https://www.bloomberg.com/news/articles/2020-03-28/fed-lifeline-shields-bond-funds-teetering-on-brink-of-etf-hell>.

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.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.⁴²¹ This confirms pre-crisis studies by the *European Systemic Risk Board*.⁴²² Market reports show ultra-short duration treasury ETFs like BlackRock's *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."⁴²³

Also, in an episode somewhat reminiscent of the failure of certain volatility-linked inverse exchanged traded products (ETPs) in 2018,⁴²⁴ several three-times leveraged, oil-linked ETPs issued by *WisdomTree* were forced to close after crude oil prices plummeted amidst oil-price war fears.⁴²⁵ Similar products issued by *USB*, *Société Générale* and *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.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.⁴²⁷ Other ETFs, like

⁴²⁰ See Ryan Clements, *supra* note 403.

⁴²¹ Katherine Greifeld, *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>.

⁴²² See Pagano, Serrano & Zechner, *supra* note 400 at 3-4, 28-29.

⁴²³ Greifeld, *supra* note 421.

⁴²⁴ See Ryan Clements, *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/>.

⁴²⁵ Chris Flood and 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>.

⁴²⁶ *Id.*

⁴²⁷ Greifeld & Kochkodin, *supra* note 401.

gold-linked funds have, however, seen a surge in investor inflows;⁴²⁸ while several new “non-transparent” actively-managed ETFs are coming to market for the first time, despite the precarious timing.⁴²⁹

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

In the week through March 25th 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.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.”⁴³¹

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

⁴²⁸ Katherine Greifeld & John Gittelsohn, *Gundlach Sounds Alarm on ‘Paper Gold’ ETFs Raking in Billions*, BLOOMBERG (April 1, 2020), <https://www.bloomberg.com/news/articles/2020-04-01/gundlach-sounds-alarm-on-paper-gold-etfs-raking-in-billions>.

⁴²⁹ Claire Ballentine, *Hidden-asset ETFs test appetite for active managers amid rout*, BNN BLOOMBERG (April 2, 2020), <https://www.bnnbloomberg.ca/hidden-asset-etfs-test-appetite-for-active-managers-amid-rout-1.1416386>.

⁴³⁰ Dan Burns, *Fed balance sheet tops \$5 trillion for first time as it enters coronavirus war mode*, REUTERS (March 26, 2020), <https://www.reuters.com/article/us-health-coronavirus-fed-balancesheet/fed-balance-sheet-tops-5-trillion-for-first-time-as-it-enters-coronavirus-war-mode-idUSKBN21D3K9>.

⁴³¹ Michael Mackenzie, *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>.

⁴³² *Id.*

⁴³³ Jim Bianco, *The Fed’s Cure Risks Being Worse Than The Disease*, BLOOMBERG OPINION (March 27, 2020), <https://www.bloomberg.com/opinion/articles/2020-03-27/federal-reserve-s-financial-cure-risks-being-worse-than-disease>.

⁴³⁴ FEDERAL RESERVE, *Policy Tools, Secondary Market Corporate Credit Facility*, <https://www.federalreserve.gov/monetarypolicy/smccf.htm> (last visited March 30, 2020).

market.”⁴³⁵ ETFs won’t, however, be eligible as pledged collateral in the Fed’s *Primary Dealer Credit Facility*.⁴³⁶

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,⁴³⁷ and preventing the bust of an economy currently in “suspended animation.”⁴³⁸ 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).⁴³⁹ Accurate pricing of ETFs and underlying bonds will, however, be difficult in the days to come as the market continues to oscillate.⁴⁴⁰

The Fed’s move is unprecedented, but it’s very possible that it prevented (hopefully not just delayed) a complete financial market meltdown.⁴⁴¹ Yet it may have also preserved Wall Street’s propensity for making “outlandish promises” about the performance (and liquidity) of their financial products.⁴⁴²

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.⁴⁴³ 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.

⁴³⁶ Joy Wiltermuth & Sunny Oh, *How the Fed’s latest crisis-era credit facility aims to finally calm rattled markets*, MARKETWATCH (March 18, 2020), https://www.marketwatch.com/story/heres-how-the-feds-latest-credit-facility-could-finally-calm-rattled-markets-2020-03-17?mod=article_inline.

⁴³⁷ Scaggs, *supra* note 402.

⁴³⁸ Mackenzie, *supra* note 431.

⁴³⁹ See Andrea Riquier, *The Fed is Going to Buy ETFs. What Does It Mean?* MARKETWATCH (March 30, 2020), <https://www.marketwatch.com/story/the-fed-is-going-to-buy-etfs-what-does-it-mean-2020-03-23>.

⁴⁴⁰ *Id.*

⁴⁴¹ *Id.*

⁴⁴² See FINANCIAL TIMES, Opinion Lex, *Market Liquidity: The Fed Put*, March 23, 2020, <https://www.ft.com/content/2d398100-d37a-45e3-9d64-e63a8504930a>.

⁴⁴³ Katherine Greifeld, *Traders Pour \$1 Billion Into Biggest Credit ETF to Front-Run Fed*, BLOOMBERG (March 24, 2020), <https://www.bloomberg.com/news/articles/2020-03-24/traders-pour-1-billion-into-biggest-credit-etf-to-front-run-fed?srnd=markets-vp>.

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.

⁴⁴⁵ See FEDERAL RESERVE BANK OF NEW YORK, *FAQs: Agency MBS Purchase* (March 24, 2020), https://www.newyorkfed.org/markets/ambis-treasury-faq?mod=article_inline.

⁴⁴⁶ Dawn Lim, *Federal Reserve Taps BlackRock to Purchase Bonds for the Government*, THE WALL STREET JOURNAL (March 24, 2020), <https://www.wsj.com/articles/federal-reserve-taps-blackrock-to-purchase-bonds-for-the-government-11585085843>.

⁴⁴⁷ *Id.*

⁴⁴⁸ See Yakob Peterseil, *A Big Fed-Driven Bet on BlackRock ETF Gets a Contrarian Warning*, BLOOMBERG (March 30, 2020), <https://www.bloomberg.com/news/articles/2020-03-30/a-big-fed-driven-bet-on-blackrock-etf-gets-a-contrarian-warning>.

⁴⁴⁹ See Clements, *supra* note 403.

while performing liquidity transformation through their products.⁴⁵⁰ 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 makers (which are critical to an ETF's operational ecosystem), and harm investors and corporations in the process.⁴⁵¹

There's an unsettling form of market alchemy that takes place when illiquid, over-the-counter bonds are transformed into instantly liquid ETFs.⁴⁵² ETF "liquidity transformation" is now being supported by the government, just like liquidity transformation in mortgage backed securities and shadow banking was supported in 2008.⁴⁵³ Given the "social costs"⁴⁵⁴ (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*).⁴⁵⁵ 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.⁴⁵⁶

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.")

⁴⁵³ See Zoltan Pozsar, Tobias Adrian, Adam Ashcraft, and Hayley Boesky, *Shadow Banking*, FEDERAL RESERVE BANK OF NEW YORK STAFF REPORT NO. 458 (July 2010), 61-64, available at <http://ssrn.com/abstract=1645337>; MORGAN RICKS, *THE MONEY PROBLEM: RETHINKING FINANCIAL REGULATION* (CHICAGO: UNIVERSITY OF CHICAGO PRESS, 2016), 96-101; William A. Birdthistle, *Breaking Bucks in Money Market Funds*, 2010 WIS. L. REV. 1155, 1163, 1190.

⁴⁵⁴ See Morgan Ricks, *Regulating Money Creation After The Crisis*, 1 HARV. BUS. REV. 75, 78, 119-120 (2011).

⁴⁵⁵ Liz Rappaport & Susanne Craig, *BlackRock Wears Multiple Hats*, THE WALL STREET JOURNAL (May 19, 2009), <https://www.wsj.com/articles/SB124269131342732625>.

⁴⁵⁶ See Lucian A. Bebchuck & Scott Hirst, *The Specter of the Giant Three*, 99 BOSTON U. L. REV. 721, 723 (2019); John C. Coates, *The Future of Corporate Governance Part I: The*

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.⁴⁵⁷ 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.”⁴⁵⁸

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.”)⁴⁵⁹ 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”).⁴⁶⁰ 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.⁴⁶¹

Problem of Twelve, HARVARD JOHN M. OLIN DISCUSSION PAPER NO. 1011 (April 2019), 16, available at http://law.harvard.edu/programs/olin_center/papers/pdf/Coates_1001.pdf.

⁴⁵⁷ *Id.*

⁴⁵⁸ Dirk Andreas Zetsche, William A Birdthistle, Douglas W Arner, & Ross P. Buckley, *Financial Operating Systems* EUROPEAN BANKING INSTITUTE (EBI) WORKING PAPER SERIES NO. 58/2020 ((March 1, 2020), available at <https://ssrn.com/abstract=3532975>.

⁴⁵⁹ *Id.* at 14-16.

⁴⁶⁰ See Clements, *supra* note 396 at 32-37.

⁴⁶¹ See Eckett, *supra* note 410.

Yet others counter that ETFs have actually passed an important “stress test” in the COVID-19 crisis.⁴⁶² Despite the discounts, a market did exist for investor exits during the worst segments of the early sell-off.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.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.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”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.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.”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.

⁴⁶² Jon Sindreau, *ETFs Have Passed Their COVID-19 Stress Test*, THE WALL STREET JOURNAL (March 27, 2020), <https://www.wsj.com/articles/etfs-have-passed-their-covid-19-stress-test-11585303519>.

⁴⁶³ *Id.*

⁴⁶⁴ See Lim, *supra* note 411.

⁴⁶⁵ See Eckett, *supra* note 410.

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>.

⁴⁶⁷ See Ian Foucher & Kyle Gray, *Exchange-Traded Funds: Evolution of Benefits, Vulnerabilities and Risks*, BANK OF CAN. FIN. SYS. REV., Dec. 2014, 42; Katherine Greifeld, *‘Illiquidity Doom Loop’ Threatens Bond ETFs Caught Up In Turmoil*, BLOOMBERG (March 20, 2020), <https://www.bloomberg.com/news/articles/2020-03-20/mizuho-charts-roadmap-for-an-illiquidity-doom-loop-in-etfs>.

⁴⁶⁸ Brian Chappatta, *Bond ETFs Will Never Be The Same After Coronavirus*, BLOOMBERG OPINION (March 23, 2020), <https://www.bloomberg.com/opinion/articles/2020-03-23/coronavirus-bond-etfs-will-never-be-the-same-after-this-crisis>.

ii. Are ETFs Making Some Asset Managers Too Interconnected To Fail?

The following sub-chapter was published on April 7, 2020 on the Columbia Law School's *Blue Sky Blog on Corporations and the Capital Markets* and is available at <https://clsbluesky.law.columbia.edu/2020/04/07/are-etfs-making-some-asset-managers-too-interconnected-to-fail/>

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

⁴⁶⁹ See Dawn Lim & Mischa Frankl-Duval, *In Market Rout, ETFs Are Where The Action Is*, THE WALL STREET JOURNAL (March 15, 2020), <https://www.wsj.com/articles/in-market-rout-etfs-are-where-the-action-is-11584270000>.

⁴⁷⁰ See Alexandra Scaggs, *The Fed Has Never Bought ETFs Before. Here's Why That's Changing*, BARRON'S (March 24, 2020), <https://www.barrons.com/articles/why-the-federal-reserve-is-now-buying-etfs-51585076254>.

⁴⁷¹ See Janet L. Yellen, *Interconnectedness and Systemic Risk: Lessons From The Financial Crisis and Policy Implications*, REMARKS AT AMERICAN ECONOMIC ASSOCIATION / AMERICAN FINANCE ASSOCIATION JOINT LUNCHEON, SAN DIEGO, CALIFORNIA (January 4, 2013), available at <https://www.federalreserve.gov/newsevents/speech/files/Yellen20130104a.pdf>.

⁴⁷² See ALAN S. BLINDER, *AFTER THE MUSIC STOPPED: THE FINANCIAL CRISIS, THE RESPONSE, AND THE WORK AHEAD*, at 112-113 (2013).

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.

⁴⁷³ See Henry T.C. Hu & John Morley, *The SEC and Regulation of Exchange-Traded Funds: A Commendable Start and a Welcome Invitation*, 92 S. CAL. L. REV. 1155 (2019); see also see Henry T.C. Hu & John Morley, *A Regulatory Framework For Exchange Traded Funds*, 91 S. CAL. L. REV. 839 (2018).

⁴⁷⁴ See Yesha Yadav, *Too-Big-To-Fail Shareholders*, 103 MINN. L. REV. 587, 592-593, 633-636 (2018).

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.⁴⁷⁵ 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.⁴⁷⁶

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.⁴⁷⁷ 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*

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-41bea055720b>.

⁴⁷⁶ See Marco Pagano, Antonio Sanchez Serrano & Josef Zechner, *Can ETFs Contribute To Systemic Risk?* REPORTS OF THE ADVISORY SCIENTIFIC COMMITTEE NO.9, EUROPEAN SYSTEMIC RISK BOARD (June 2019), 3-4, 28-29, https://www.esrb.europa.eu/pub/pdf/asc/esrb.asc190617_9_canetfscontributesystemicrisk~983ea11870.en.pdf.

⁴⁷⁷ See I. Ben-David, F. Franzoni, F. & R. Moussawi, *Do ETFs increase volatility?* 73(6) JOURNAL OF FINANCE. 2471 (2018).

Stability Oversight Council's embrace of an activities-based framework (away from entity-specific) for non-bank systemically important financial institutions.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.⁴⁷⁹

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.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.⁴⁸¹ If government support is a "social cost" of liquidity transformation,⁴⁸² then perhaps, now that the

⁴⁷⁸ See BLACKROCK, LETTER TO FINANCIAL STABILITY OVERSIGHT COUNCIL, RE: COMMENTS ON PROPOSED INTERPRETIVE GUIDANCE, AUTHORITY TO REQUIRE SUPERVISION AND REGULATION OF CERTAIN NONBANK FINANCIAL COMPANIES, RIN 4030-AA00 (May 13, 2019), at 47, available at <https://www.blackrock.com/corporate/literature/publication/fsoc-interpretive-guidance-supervision-regulation-certain-nonbank-financial-companies-051319.pdf>; VANGUARD, LETTER TO FINANCIAL STABILITY OVERSIGHT COUNCIL, RE: AUTHORITY TO REQUIRE SUPERVISION AND REGULATION OF CERTAIN NONBANK FINANCIAL COMPANIES; RIN 4030-AA00 (May 13, 2019), available at <https://www.regulations.gov/document?D=FSOC-2019-0001-0013>.

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).

⁴⁸⁰ See Zoltan Pozsar, Tobias Adrian, Adam Ashcraft, and Hayley Boesky, *Shadow Banking*, FEDERAL RESERVE BANK OF NEW YORK STAFF REPORT NO. 458 (July 2010), 61-64, available at <http://ssrn.com/abstract=1645337>; MORGAN RICKS, *THE MONEY PROBLEM: RETHINKING FINANCIAL REGULATION* (CHICAGO: UNIVERSITY OF CHICAGO PRESS, 2016), 96-101.

⁴⁸¹ *Id.* at 61-64; see William A. Birdthistle, *Breaking Bucks in Money Market Funds*, 2010 WIS. L. REV. 1155, 1163, 1190.

⁴⁸² See Morgan Ricks, *Regulating Money Creation After The Crisis*, 1 HARV. BUS. REV. 75, 78, 119-120 (2011).

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,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.⁴⁸⁴

⁴⁸³ See Lim & Frankl-Duval, *supra* note 469.

⁴⁸⁴ See Andrew G. Haldane, *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”

The following chapter is forthcoming to be published in the Spring 2021 edition of the HOU. BUS. & TAX L. J. as “*New Funds, Familiar Fears: Do Exchange Traded Funds Make Markets Less Stable? Part II, Interaction Risks*” and is available online here:
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3486027

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).⁴⁸⁵ ETFs have experienced a tremendous post-GFC surge,⁴⁸⁶ while connecting retail investors with pensions and major banks.⁴⁸⁷ They are also believed by many to be a lower-cost, tax advantaged,⁴⁸⁸ easily tradeable, instant diversification, upgrade over mutual funds.⁴⁸⁹ Yet they may also be making the financial system less stable.⁴⁹⁰ Signs point to continued market growth,⁴⁹¹ especially in fixed income products;⁴⁹² an ever-expanding

⁴⁸⁵ See Eva Su, *Exchange Traded Funds (ETFs): Issues For Congress*, CONGRESSIONAL RESEARCH SERVICE REPORT, 7-5700 (September 24, 2018), 16, available at <https://fas.org/sgp/crs/misc/R45318>; see also Henry T.C. Hu & John Morley, *A Regulatory Framework For Exchange Traded Funds*, 91 S. CAL. L. REV. 839 (2018); Henry T.C. Hu & John Morley, *The SEC and Regulation of Exchange-Traded Funds: A Commendable Start and a Welcome Invitation.*, 92 S. CAL. L. REV. 1155 (2019).

⁴⁸⁶ See Mark Kolakowski, *ETF Assets Cross \$4 Trillion Milestone*, INVESTOPEDIA (July 10, 2019), <https://www.investopedia.com/etf-assets-cross-usd4-trillion-milestone-4692488>.

⁴⁸⁷ See Rachel Evans & Carolina Wilson, *How ETFs Became The Market*, BLOOMBERG (September 13, 2018), <https://www.bloomberg.com/graphics/2018-growing-etf-market/?srnd=etfs>.

⁴⁸⁸ Zachary R. Mider, Rachel Evans, Carolina Wilson & Christopher Cannon, *The ETF Tax Dodge is Wall Street's 'Dirty Little Secret'*, BLOOMBERG (March 29, 2019), <https://www.bloomberg.com/graphics/2019-etf-tax-dodge-lets-investors-save-big/>.

⁴⁸⁹ See BLACKROCK, *What is an ETF?* <https://www.blackrock.com/ca/individual/en/learning-centre/etf-education/what-is-an-etf> (last visited December 10, 2019).

⁴⁹⁰ See Marco Pagano, Antonio Sanchez Serrano & Josef Zechner, *Can ETFs Contribute To Systemic Risk?* REPORTS OF THE ADVISORY SCIENTIFIC COMMITTEE NO.9, EUROPEAN SYSTEMIC RISK BOARD (June 2019), https://www.esrb.europa.eu/pub/pdf/asc/esrb.asc190617_9_canetfscontributesystemicrisk~983ea11870.en.pdf (hereinafter “ESRB Report”).

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.”)

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. Purnanandam, *Originate-to-distribute model and the subprime mortgage crisis*, 24(6) REVIEW OF FINANCIAL STUDIES, 1881-1915 (2011).

choice of products including “thematic” styles;⁴⁹³ and a growing dominance of mega-ETF issuer firms like BlackRock, Vanguard and State Street.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)⁴⁹⁵ and also embraced by high frequency traders (HFT) who profit by providing daily liquidity and market making (MM) activity.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.⁴⁹⁷

Given this operational complexity, the risks in ETFs aren’t well understood, and they emanate from how intermediaries interact in this ecosystem.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.⁴⁹⁹ It also highlighted, using examples from 1987’s “Black Monday” crash,⁵⁰⁰ and the GFC,⁵⁰¹ that

⁴⁹³ The ever-expanding menu of ETF choices also includes “virtue signals” and “trends” including religion, veganism and marijuana. See Jennifer Thompson, *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, *A Regulatory Framework*, *supra* note 1 at 843.

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. Bebchuk & Scott Hirst, *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>.

⁴⁹⁵ See Hugh Son, *JP Morgan Is Rolling Out a Robo-Adviser With Free ETFs to Lure New Investors*, CNBC (July 10, 2019), <https://www.cnbc.com/2019/07/10/jpmorgan-creates-robo-adviser-you-invest-portfolios-with-free-etfs.html>.

⁴⁹⁶ See Ivan Martchev, *This Is How Some ETFs Are Run Like A Shell Game Scam*, MARKETWATCH (June 27, 2019), <https://www.marketwatch.com/story/this-is-how-some-etfs-are-run-like-a-shell-game-scam-2018-06-27>.

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

⁴⁹⁸ See Ryan Clements, *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, *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.”)

⁴⁹⁹ *Id.* at 15-19.

⁵⁰⁰ *Id.* at 29-33.

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.⁵⁰²

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.⁵⁰³ 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.⁵⁰⁴ 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.⁵⁰⁵

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

⁵⁰² 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, *The Limits of Arbitrage*, 52(1) 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.”); see also Hu & Morley, *A Welcome Invitation*, *supra* note 485 at 1196.

⁵⁰³ See *infra*, Section III.

⁵⁰⁴ See *infra*, Section IV.

⁵⁰⁵ See *infra*, Section V.

participants (AP),⁵⁰⁶ MMs,⁵⁰⁷ and fund sponsors;⁵⁰⁸ and shows how the failure of a prominent intermediary could trigger an investor run.⁵⁰⁹ This section also shows how cascade selling could arise from independent profit-seeking actions of APs (for example when using “operational shorting” strategies),⁵¹⁰ and also occur as a result of interactions between ETF secondary market trading, and sales of underlying assets.⁵¹¹ This section also notes the impact of robo-advisors and HTF on information cascades and investor herding in ETFs.⁵¹²

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.⁵¹³ 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.⁵¹⁴ 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.⁵¹⁵ It also highlights how ETFs could be contributing to more volatile markets.⁵¹⁶

⁵⁰⁶ See Clements, *supra* note 498 at 38-42; See also 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.”); see also BLACKROCK, *A Primer on ETF Primary Trading and the Role of Authorized Participants* (March 2017), 3, available at <https://www.blackrock.com/corporate/literature/whitepaper/viewpoint-etf-primary-trading-role-of-authorized-participants-march-2017.pdf> (BlackRock lists the following examples of “Common U.S. APs” as “Bank of America Merrill Lynch, Citigroup, Credit Suisse, Deutsche Bank, Goldman Sachs & Co., Jeffries, JP Morgan, KCG, Morgan Stanley, UBS Securities, Virtu.”); see also Hu & Morley, *A Regulatory Framework*, *supra* note 485 at 851-856; Hu & Morley, *A Welcome Invitation*, *supra* note 485 at 1157-1162.

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.”⁵¹⁷ Specifically, information cascades and investor herds were evidenced in the demand for mortgage-backed securities (MBS),⁵¹⁸ the run on Lehman Brothers in the wholesale funding market,⁵¹⁹ and the herding behavior which was prominent in the auction rate securities (ARS) market failure in the GFC.⁵²⁰

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,⁵²¹ and in the overlooked risks in the MBS market during the subprime lending boom.⁵²² 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*

⁵¹⁷ See *infra*, Section III(b), Section IV(e); see also Dave Nadig, *Understanding ETF ‘Flash Crashes’*, ETF.COM (August 26, 2015), <https://www.etf.com/sections/blog/understanding-etf-flash-crashes?nopaging=1>.

⁵¹⁸ See *infra*, Section IV(e); see also Viral V. Acharya & Matthew Richardson, *Causes of the Financial Crisis*, 21(2) CRITICAL REVIEW: A JOURNAL OF POLITICS AND SOCIETY 195 (2009).

⁵¹⁹ See *infra*, Section IV(v); see also William O. Fisher, *Predicting a Heart Attack: The Fundamental Opacity of Extreme Liquidity Risk*, 86 TEMP. L. REV. 465 (2014).

⁵²⁰ See *infra*, Section IV(e).

⁵²¹ See Fisher, *supra* note 518.

⁵²² See Steven L. Schwarcz, *Regulating Complexity in Financial Markets*, 87 WASH U. L. REV. 211, 218-220 (2009).

Modern Financial Insanity,⁵²³ including the “Black Monday” stock market crash of 1987,⁵²⁴ the East-Asian financial crisis in the 1990s,⁵²⁵ the dot.com boom,⁵²⁶ and the GFC.⁵²⁷ Professors Ian Ayres and Joshua Mitts posit that herding increases systemic risk and negatively impacts the “production of information”⁵²⁸ and that “mimicry” in the marketplace (especially during a financial panic) can generate “disabling information cascades.”⁵²⁹ 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.”)⁵³⁰

An information cascade can occur “when people form beliefs based upon the belief or opinion of others” even if the latter isn’t true.⁵³¹ 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.”⁵³² 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.”⁵³³

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.”⁵³⁴ This can set off a “chain reaction” of group behavior – also described by Professors Bryan Druzin and Jessica Li as

⁵²³ MICHAEL LEWIS, PANIC! THE STORY OF MODERN FINANCIAL INSANITY (1st ed. 2009).

⁵²⁴ *Id.* at 20-78.

⁵²⁵ *Id.* at 79-161.

⁵²⁶ *Id.* at 162-263.

⁵²⁷ *Id.* at 283-366.

⁵²⁸ See Ian Ayres & Joshua Mitts, *Anti-Herding Regulation*, 5 HARV. BUS. L. REV. 1,1 (2015).

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 Jonathan R. Macey & James P. Holdcroft, Jr., *Failure Is An Option: An Ersatz-Antitrust Approach To Financial Regulation*, 120 YALE L.J. 1368, 1383-4 (2011).

⁵³³ Seth C. Oranburg, *A Place Of Their Own: Crowds In The New Market For Equity Crowdfunding*, 100 MINN. L. REV. HEADNOTES 147, 152 (2016).

⁵³⁴ See Steven L. Schwarcz, *Regulating Complacency: Human Limitations and Legal Efficacy*, 93 NOTRE DAME L. REV. 1073, 1077-78 (2018).

“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.

⁵³⁶ See Robert C. Hockett, *Recursive Collective Action Problems: The Structure of Procyclicality in Financial and Monetary Markets, Macroeconomies and Formally Similar Contexts*, 3 JOURNAL OF FINANCIAL PERSPECTIVES (2015).

⁵³⁷ *Id.* at 1.

⁵³⁸ See Cass R. Sunstein, *Wall Street’s Lemmings*, THE NEW REPUBLIC (October 10, 2018), <https://newrepublic.com/article/63023/wall-streets-lemmings>.

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).

⁵⁴³ See M. Humayun Kabir, *Did Investors Herd During The Financial Crisis? Evidence From The US Financial Industry*, 18(1) INTERNATIONAL REVIEW OF FINANCE 59 (2018).

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.⁵⁴⁵ 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.”⁵⁴⁶

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.⁵⁴⁷ Wholesale funding, including commercial paper, repos and interbank loans, provide banks with a “non-depository” source of short-term financing;⁵⁴⁸ and liquidity in the wholesale funding market experienced a “sharp and widespread collapse” in September 2008 following Lehman’s bankruptcy filing.⁵⁴⁹ Observers reported that “access to wholesale funding evaporated in a matter of days, if not hours.”⁵⁵⁰

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.⁵⁵¹ Professor Markus Brunnermeier has argued that securitization in the GFC “led to an opaque web of interconnected obligations” and drove “several amplification mechanisms”⁵⁵² and “network effects” when financial institutions acted in dual roles as lenders and borrowers.⁵⁵³ Although ETF intermediaries don’t act as lenders and borrowers, some have dual roles as ETF arbitrageurs and underlying asset managers or dealers.⁵⁵⁴ Herding didn’t

https://www.forbes.com/2008/09/19/banks-contagion-globalization-cx_0919oxford.html#72e8c6d43ed9.

⁵⁴⁵ See Song Han & Dan Li, *Liquidity Crisis, Runs, and Security Design - Lessons from the Collapse of the Auction Rate Securities Market*, FEDERAL RESERVE BOARD WORKING PAPER (February 15, 2009), available at <https://ssrn.com/abstract=1327429>.

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.

⁵⁵¹ See Markus Brunnermeier, *Deciphering the Liquidity and Credit Crunch 2007-2008*, 23(1) JOURNAL OF ECONOMIC PERSPECTIVES 77, (2009).

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.

end with the GFC. Recent empirical evidence has also identified herding in the “flash crash” of May 2010.⁵⁵⁵ 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.”⁵⁵⁶

c. How Could ETFs Contribute to Investor Herd Formation?

An ETF is a collective investment vehicle that gains “market exposure at lower fees.”⁵⁵⁷ 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.”⁵⁵⁸ Investor demand for ETFs, and other “passive investing” products may be creating “artificial popularity” for assets comprising an index, or representative basket, during in-flow periods (and a potential bottleneck of future risk that could be unleashed during a market sell-off).⁵⁵⁹

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.⁵⁶⁰ 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.”⁵⁶¹

⁵⁵⁵ See Riza Demirer, Karyl Leggio & Donald Lien, *Herding and Flash Events: Evidence From the 2010 Flash Crash*, FINANCE RESEARCH LETTERS (December 26, 2018), available at <https://ssrn.com/abstract=3263881>.

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.

⁵⁵⁹ See Michael Cannivet, *The Passive Investing Boom Poses A New Risk: Artificial Popularity*, FORBES (June 27, 2018), <https://www.forbes.com/sites/michaelcannivet/2018/06/27/the-passive-investing-boom-poses-a-new-risk-artificial-popularity/#4ef54d843e93>.

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, in ETFs is related to the “concentration” of ETF issuers,⁵⁶² financial intermediaries (like APs and MMs) and swap counterparties (for synthetic ETFs).⁵⁶³ The ETF market has a small number of large fund issuers.⁵⁶⁴ 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.⁵⁶⁵ 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.⁵⁶⁶ If consolidation occurs in MM or AP firms,⁵⁶⁷ 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.⁵⁶⁸

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.⁵⁶⁹ ETFs are administratively cheap and they may not have a “great tolerance for liquidity risk.”⁵⁷⁰ 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.”⁵⁷¹

⁵⁶² See ESRB Report, *supra* note 490 at 3.

⁵⁶³ *Id.* at 16, 30.

⁵⁶⁴ See *Su supra* note 485 at 1; see also Bebhuck & Hirst, *supra* note 494.

⁵⁶⁵ ESRB Report, *supra* note 490 at 31.

⁵⁶⁶ See CENTRAL BANK OF IRELAND, *Feedback Statement on DP6 – Exchange Traded Funds* (2018), at 11, available at <https://www.centralbank.ie/docs/default-source/publications/discussion-papers/discussion-paper-6/feedback-statement-on-exchange-traded-funds---discussion-paper-6.pdf?sfvrsn=2> (hereinafter “CBI Feedback Statement”).

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>.

⁵⁶⁸ For an analogous application from the GFC that shows how liquidity is “fragile” during a crisis, see Song Han & Dan Li, *The Fragility of Discretionary Liquidity Provision: Lessons From The Collapse Of The Auction Rate Securities Market*, FINANCE AND ECONOMICS DISCUSSION SERIES DIVISIONS OF RESEARCH & STATISTICS AND MONETARY AFFAIRS, FEDERAL RESERVE BOARD (May 2010), available at <https://www.federalreserve.gov/pubs/feds/2010/201050/201050pap.pdf>.

⁵⁶⁹ See CBI Feedback Statement, *supra* note 566.

⁵⁷⁰ See *id.* at 47-48.

⁵⁷¹ See Steven L. Schwarcz, *Rethinking the Disclosure Paradigm in a World of Complexity*, 2004 U. ILL. L. REV. 1, 4-5.

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.”⁵⁷² 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.”⁵⁷³ 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.”⁵⁷⁴ This creates market instability.⁵⁷⁵ 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”⁵⁷⁶) which is “unhinged” from asset price information.⁵⁷⁷

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.⁵⁷⁸ 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.⁵⁷⁹

If the ETF market continues to grow (a highly probable outcome⁵⁸⁰) 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

⁵⁷² See Ayan Bhattacharya and Maureen O'Hara, *Can ETFs Increase Market Fragility? Effect of Information Linkages in ETF Markets* (April 17, 2018), Working Paper, available at <https://ssrn.com/abstract=2740699>.

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.

⁵⁷⁸ See Hu & Morley, *A Regulatory Framework*, *supra* note 485 at 846, 861-863; see also Hu & Morley, *A Welcome Invitation.*, *supra* note 485.

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").⁵⁸¹ 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.⁵⁸²

The ESRB Report also identified the possibility for "procyclical" market movements influenced by complex ETFs, like those utilizing leverage and "rule-based trading strategies."⁵⁸³ The ESRB Report notes how a "decoupling" of the ETF arbitrage function (the focus of the first article in this study⁵⁸⁴) could lead to a coordinated "fire sale" as investors *en-mass* "lose faith" in the ETF operational ecosystem and look to liquidate positions.⁵⁸⁵ 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.⁵⁸⁶

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.⁵⁸⁷ It appears that "passive investing" has eclipsed active management (one reporter recently called it the "passive singularity.")⁵⁸⁸ The

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.

⁵⁸² *See* CENTRAL BANK OF IRELAND, *Exchange Traded Fund Discussion Paper* (2017), 26, available at <https://www.centralbank.ie/docs/default-source/publications/discussion-papers/discussion-paper-6/discussion-paper-6---exchange-traded-funds.pdf> (hereinafter "CBI Discussion Paper").

⁵⁸³ *See* ESRB Report, *supra* note 490 at 2.

⁵⁸⁴ *See* Clements, *supra* note 498

⁵⁸⁵ *See* ESRB Report, *supra* note 490 at 2, 22-23, 28; *see also* Q. Bai, S.A. Bond, & B.C. Hatch, *The Impact of leveraged and inverse ETFs on underlying stock returns*, 43(1) REAL ESTATE ECONOMICS, 37, 37-66 (2015); P. Shum, W. Hejazi, E. Haryanto, & A. Rodier, *Intraday share price volatility and leveraged ETF rebalancing*, 20(6) REVIEW OF FINANCE 2379 (2016).

⁵⁸⁶ *See* ESRB Report, *supra* note 490 at 3, 18.

⁵⁸⁷ *See* James Rickards, *Free-Riding Investors Set up Markets For A Major Collapse*, DAILY RECKONING (September 24, 2018), <https://dailyreckoning.com/free-riding-investors-set-up-markets-for-a-major-collapse/>.

⁵⁸⁸ Dani Burger, *Passive Becomes The New Active As Indexing Rules Everything*, THE GLOBE AND MAIL (March 1, 2018), <https://www.theglobeandmail.com/globe-investor/funds-and-etfs/etfs/passive-becomes-the-new-active-as-indexing-rules-everything/article38161099/>.

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 Akerloff 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 though 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

⁵⁸⁹ BARRON'S, *A Dire Warning About ETFs* (April 27, 2017), <https://www.barrons.com/articles/advisors-cash-is-king-amid-uncertainty-51546881439>.

⁵⁹⁰ See GEORGE A. AKERLOFF & ROBERT J. SHILLER, *ANIMAL SPIRITS: HOW HUMAN PSYCHOLOGY DRIVES THE ECONOMY, AND WHY IT MATTERS FOR GLOBAL CAPITALISM*, 116-130 (2nd ed. 2010).

⁵⁹¹ See *id.* at 123-124.

⁵⁹² See *id.* at 125-127.

⁵⁹³ *Id.* at 119-120.

⁵⁹⁴ Teresa Rivas, *'Passive Investing Is Worse Than Marxism': Bernstein*, BARRON'S (August 23, 2016), <https://www.barrons.com/articles/advisors-cash-is-king-amid-uncertainty-51546881439>.

⁵⁹⁵ Burger, *supra* note 588.

and loose monetary policy” that has arguably driven asset value inflation.⁵⁹⁶ Related to this is the contentious (and unsettled) debate on the social utility, and deleterious impact of “common ownership”⁵⁹⁷ by index-based funds like ETFs on consumer prices, competition, shareholder engagement and executive compensation.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.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

⁵⁹⁶ Lance Roberts, *The Risk Of An ETF-Driven Liquidity Crash*, SEEKING ALPHA (October 2, 2018), <https://seekingalpha.com/article/4209301-risk-etf-driven-liquidity-crash>.

⁵⁹⁷ See BLACKROCK, *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.”)

⁵⁹⁸ A full review of the “common ownership” impact debate is beyond the scope of this article but for a sampling of the issues involved *compare and contrast*: BLACKROCK, *Index Investing*, *supra* note 597; Eric A. Posner, Fiona Scott Morton, & E. Glen Weyl, *A Proposal to Limit the Anti-Competitive Power of Institutional Investors*, 81 ANTITRUST LAW JOURNAL 669 (2017); Einer Elhauge, *Horizontal Shareholding*, 129 HARV. L. REV. (Mar. 10, 2016), available at <http://cdn.harvardlawreview.org/wp-content/uploads/2016/03/1267-1317-Online.pdf>; Einer Elhauge, *The Causal Mechanisms of Horizontal Shareholding*, Working Paper (August 2, 2019), available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3370675; Vito J. Racaneli, *Do Institutional Investors Suppress Competition?* BARRON’S (September 17, 2018), <https://www.barrons.com/articles/do-big-investors-push-the-antitrust-envelope-1537220418>; José Azar, Martin C. Schmalz, & Isabel Tecu, *Anti-Competitive Effects of Common Ownership*, 73(4) JOURNAL OF FINANCE (2018); José Azar, Sahil Raina & Martin C. Schmalz, *Ultimate Ownership and Bank Competition* Working Paper (July 23, 2016), available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2710252; Miguel Antón, Florian Ederer, Mireia Giné, and Martin C. Schmalz, *Common Ownership, Competition, and Top Management Incentives*, CESIFO WORKING PAPER SERIES NO. 6178 (2016), available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2885826; Daniel P. O’Brien and Keith Waehrer, *The Competitive Effects of Common Ownership: We Know Less than We Think*, Working Paper (Feb. 23, 2017), available at https://papers.ssrn.com/sol3/papers2.cfm?abstract_id=2922677; Edward B. Rock and Daniel L. Rubinfeld, *Defusing the Antitrust Threat to Institutional Investor Involvement in Corporate Governance*, NYU LAW AND ECONOMICS RESEARCH PAPER NO. 17-05 (Mar. 1, 2017), available at https://papers.ssrn.com/sol3/papers2.cfm?abstract_id=2925855; Jacob Gramlich & Serafin Grundl, *Testing for Competitive Effects of Common Ownership*, FINANCE AND ECONOMICS DISCUSSION SERIES 2017-029, WASHINGTON: BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM, <https://doi.org/10.17016/FEDS.2017.029>.

⁵⁹⁹ See Luke Kawa, *Index-Crazed Investors Turning S&P 500 Into One Gigantic Company*, BLOOMBERG (January 15, 2019), <https://www.bloomberg.com/news/articles/2019-01-15/index-crazed-investors-turning-s-p-500-into-one-gigantic-company>.

and virtually all strategic interactions among firms.”⁶⁰⁰ 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.⁶⁰¹ This could also influence herds as “investors in firms become more similar to each other over time.”⁶⁰² Surprisingly, the referenced study also notes that this trend pre-dates the success of BlackRock and Vanguard.⁶⁰³ The result has been described as transforming the entire S&P 500 into “one gigantic company.”⁶⁰⁴

Other passive investment critics have noted how these investments can “impede” good corporate governance and the efficiency of markets.⁶⁰⁵ 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.”⁶⁰⁶ One potential solution suggested by this commentator would be a system of “*pro rata* voting.”⁶⁰⁷

In response to the growing problem of block shares held by passive index funds, disincentivized from expending resources to enhance corporate governance,⁶⁰⁸ 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.⁶⁰⁹ SEC Chairman Jay Clayton, in recent remarks to

⁶⁰⁰ Matthew Backus, Christopher Conlon, & Michael Sinkinson, *Common Ownership in America: 1980-2017*, NATIONAL BUREAU OF ECONOMIC RESEARCH WORKING PAPER NO. 25454 (January 2019), available at <https://www.nber.org/papers/w25454>.

⁶⁰¹ See Kawa *supra* note 599.

⁶⁰² *Id.*

⁶⁰³ See Backus et al., *supra* note 600.

⁶⁰⁴ Kawa, *supra* note 599.

⁶⁰⁵ See Maurice M. Lefkort, *The Problem With Index Investing*, WHARTON MAGAZINE (May 14, 2018), <http://whartonmagazine.com/blogs/the-problem-with-index-investing/#sthash.iZtyeTxN.5V7LDKX5.dpbs>.

⁶⁰⁶ *Id.*

⁶⁰⁷ Maurice M. Lefkort, *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.mluoON6A.JYuxvwmz.dpbs>.

⁶⁰⁸ See Paul H. Edelman, Randall S. Thomas & Robert B. Thompson, *Shareholder Voting In An Age of Intermediary Capitalism*, 87 S. CAL. L. REV. 1359 (2014).

⁶⁰⁹ See U.S. SECURITIES AND EXCHANGE COMMISSION, *Statement Announcing SEC Staff Roundtable on the Proxy Process* (July 30, 2018), <https://www.sec.gov/news/public-statement/statement-announcing-sec-staff-roundtable-proxy-process>; see also Edward Rock & Marcel Kahan, *Index Funds and Corporate Governance: Let Shareholders Be Shareholders*,

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.”⁶¹⁰

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.⁶¹¹ 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.⁶¹² They note that “non-homogenous” investor interactions yield unexpected price movements, price bubbles and crashes.⁶¹³ Also, citing research from economists Paul De Grauwe and Marianna Grimaldi,⁶¹⁴ 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.”⁶¹⁵

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.⁶¹⁶ HFT undoubtedly provides liquidity for ETFs;

NEW YORK UNIVERSITY SCHOOL OF LAW, LAW & ECONOMICS RESEARCH PAPER SERIES
WORKING PAPER NO. 18-39 (December 2018), available at <https://ssrn.com/abstract=3295098>.

⁶¹⁰ U.S. SECURITIES AND EXCHANGE COMMISSION, *Public Statement, Remarks To The SEC Investor Advisory Committee* (September 13, 2018), <https://www.sec.gov/news/public-statement/statement-clayton-iac-091318>.

⁶¹¹ See BENOIT MANDELBROT & RICHARD L. HUDSON, *THE (MIS)BEHAVIOR OF MARKETS, A FRACTAL VIEW OF FINANCIAL TURBULENCE*, 85 (1st ed. 2004)

⁶¹² See *id.* at 89-107.

⁶¹³ See *id.* at 85.

⁶¹⁴ See Paul De Grauwe & Marianna Grimaldi, *Bubbling and Crashing Exchange Rates*, CESIFO WORKING PAPER 1045 (2003).

⁶¹⁵ See Mandelbrot & Hudson, *supra* note 611 at 85.

⁶¹⁶ See ESRB Report. *supra* note 490 at 7; see also M. Broman, M. & Shum, *Relative liquidity, fund flows and short-term demand: evidence from Exchange-Traded Funds*, 53(1) FINANCIAL REVIEW 87 (2018); M. Broman, *Liquidity, style investing, and excess co-movement of exchange-traded fund returns*, 30 JOURNAL OF FINANCIAL MARKETS, 27 (2016); L. Deville, A. Calamia, & F. Riva, *Liquidity in European equity ETFs: What really matters?*, BANKERS

however, the nature of their contribution to the ETF market ecosystem is debatable.⁶¹⁷ 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.”⁶¹⁸ HFT has been criticized as being “active and aggressive traders, committing fratricide when it suits them, or withdrawing altogether from volatile markets.”⁶¹⁹ 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.⁶²⁰

HFT legitimate market making can also tread dangerously close to “market manipulation” and “scalping.”⁶²¹ Market participants have also expressed recent concerns that HFT sourced liquidity could vanish in a crisis.⁶²² 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.”⁶²³

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).⁶²⁴ On February 5, 2018

MARKETS & INVESTORS: AN ACADEMIC & PROFESSIONAL REVIEW, 60 (2013); Sophia Hamm, *The Effect of ETFs on Stock Liquidity* (April 23, 2014), working paper available at <https://ssrn.com/abstract=1687914>.

⁶¹⁷ See Ted Knutson, *HFT Mixed Bag for Retail Investors Say Experts*, FORBES (September 24, 2018), <https://www.forbes.com/sites/tedknutson/2018/09/24/retail-investors-helpedhurt-by-high-frequency-traders-experts-say/#15ad69765e5b>; see also Larry Swedroe, *Swedroe: High Frequency Trading’s Impact*, ETF.COM (February 24, 2016), <https://www.etf.com/sections/index-investor-corner/swedroe-high-frequency-tradings-impact?nopaging=1>.

⁶¹⁸ See Hilary J. Allen, *The SEC As Financial Stability Regulator*, 43 J. CORP. L. 715, 743-744 (2018).

⁶¹⁹ See Letter from R.T. Leuchtkofer (pseud.) on File No. S7-02-10 (Oct. 31, 2010), <https://www.sec.gov/comments/s7-02-10/s70210-300.htm>.

⁶²⁰ See Iris H-Y Chiu, *Fintech and Disruptive Business Models in Financial Products, Intermediation and Markets – Policy Implications For Financial Regulations*, 21 J. TECH. L. & POL’Y 55, 103-104 (2016); see also Emiliós Avgouleas, *The Global Financial Crisis, Behavioural Finance and Financial Regulation: In Search of a New Orthodoxy*, 9 J. CORP. L. STUD. 23 (2009).

⁶²¹ See Stanislav Dolgoplov, *Regulating Merchants of Liquidity: Market Making From Crowded Floors to High Frequency Trading*, 18 U. PA. J. BUS. L. 651, 697 (2016).

⁶²² See Tae Kim, *Goldman Sachs Says Computerized Trading May Make Next “Flash Crash” Worse*, CNBC (May 23, 2018), <https://www.cnbc.com/2018/05/23/goldman-sachs-rise-of-trading-machines-could-make-next-market-crash-much-worse.html>.

⁶²³ *Id.*

⁶²⁴ See Hu & Morley, *A Regulatory Framework*, *supra* note 485 at 846, 862-863.

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).⁶²⁵ The losses on inverse VIX products were massive (estimated at over \$3 billion⁶²⁶) and the media reaction was quick and negative.⁶²⁷ Influential investors suggested the products were increasing financial instability (Carl Icahn called them a “casino on steroids”⁶²⁸ and Devesh Shah, the inventor of the VIX noted “in my wildest imagination I don’t know why these products exist.”⁶²⁹)

The episode was, however, an interesting “stress test,” on ETF arbitrage functionality in the context of potential intermediary herding.⁶³⁰ 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,⁶³¹ and orderly trading in fixed income ETFs.⁶³² BlackRock has cited this experience as indicative of the ETF ecosystem’s dependability in a crisis scenario.⁶³³

Numerous digital wealth management platforms (called “robo-advisers”)⁶³⁴ 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.⁶³⁵ Robo-advisers are growing in popularity since they serve clients who, because

⁶²⁵ See BLACKROCK VIEWPOINT, *February 2018 Case Study: ETF Trading In A High Velocity Market*, March 2018, at 2 (hereinafter “BlackRock ETF Case Study”); see also Hu & Morley, *A Regulatory Framework*, *supra* note 1 at 846, 862-863.

⁶²⁶ BlackRock ETF Case Study, *supra* note 625.

⁶²⁷ Berkeley Lovelace Jr., *Cramer: A little-known security tied to a calm market became a ‘toxic cigarette’ for this sell off*, CNBC (February 6, 2018), <https://www.cnbc.com/2018/02/06/cramer-xiv-note-proved-to-be-a-toxic-cigarette-for-the-market.html>.

⁶²⁸ Matthew J. Belvedere, *Icahn: The Market Will One Day ‘Implode’ Because Of These Wacky Funds Using So Much Leverage*, CNBC (February 6, 2018), <https://www.cnbc.com/2018/02/06/billionaire-investor-carl-icahn-there-are-too-many-derivatives-and-the-current-market-is-a-rumbling-warning.html>.

⁶²⁹ Max Abelson & Joe Weisenthal, *An Inventor of the VIX: ‘I Don’t Know Why These Products Exist’*, BLOOMBERG (February 6, 2018), <https://www.bloomberg.com/news/articles/2018-02-06/an-inventor-of-the-vix-i-don-t-know-why-these-products-exist>.

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).

⁶³⁵ See Nicole G. Iannarone, *Computer as Confidant: Digital Investment Advice and the Fiduciary Standard*, 93 CHI-KENT L. REV. 141 (2018).

of factors such as geographic location or income, are unable to obtain sophisticated investment management services.⁶³⁶ These artificial intelligence driven innovations can also help remedy traditional investor shortcomings like irrational investor tendencies and biases.⁶³⁷

ETFs form the foundation of many portfolios constructed by robo-advisers.⁶³⁸ 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.⁶³⁹ 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.”⁶⁴⁰ The *Organization For Economic Cooperation and Development* (OECD) has also cited robo-advisers’ use of ETFs as a potential systemic,⁶⁴¹ and “pro-cyclical,” stability risk.⁶⁴² 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.⁶⁴³

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.”⁶⁴⁴ If investors of certain ETF fund strategies (like fixed income) experience collective

⁶³⁶ See *id.*

⁶³⁷ See Stephen Lynch, *Man v. Machine: AI’s Growing Role in Investment Management*, SEEKING ALPHA (July 23, 2019), <https://seekingalpha.com/article/4276777-man-vs-machine-ais-growing-role-investment-management>.

⁶³⁸ See Ben Judge, *The Rise of the Robo-Advisers*, MONEYWEEK (October 2, 2017), <https://moneyweek.com/461092/the-rise-of-the-robo-advisers/>.

⁶³⁹ See James Rickards, *Robot Trading Will End in Disaster*, DAILY RECKONING (July 19, 2019), <https://dailyreckoning.com/robot-trading-will-end-in-disaster/>.

⁶⁴⁰ Judge, *supra* note 638.

⁶⁴¹ See ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT (OECD), *Robo-Advice For Pensions* (2017) at 15-16; see also William Magnuson, *Regulating Fintech*, 71 VAND. L. REV. 1167, 1202 (2018).

⁶⁴² See OECD, *supra* note 641 at 15-16.

⁶⁴³ See Michael Sheetz, *Jeffrey Gundlach Says Passive Investing Has Reached A ‘Mania’ – Investors Should Avoid Index Funds*, CNBC (December 17, 2018), <https://www.cnbc.com/2018/12/17/gundlach-says-passive-investing-has-reached-mania-status.html>.

⁶⁴⁴ See Will Martin, *‘A Huge Risk of Contagion’: Everything You Need To Know About ETFs – The Hot Investment Area That Some Think Will Cause The Next Financial Crisis*, BUSINESS INSIDER (October 17, 2017), <https://www.businessinsider.com/what-is-an-etf-risk-global-financial-crisis-2017-10>.

liquidity shortages, during a crisis or market sell-off, there is an additional risk of contagion or “spillover” to different ETF types,⁶⁴⁵ 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.”⁶⁴⁶

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.⁶⁴⁷ 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.⁶⁴⁸ The *International Monetary Fund* (IMF) has also recently identified contagion risk as potentially stemming from ETF market activity.⁶⁴⁹

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

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.

⁶⁴⁷ See ESRB Report, *supra* note 490 at 21; see also Su *supra* note 485; INTERNATIONAL MONETARY FUND, *A bumpy road ahead*, GLOBAL FINANCIAL STABILITY REPORT, CHAPTER 1 (April 2018), available from

<https://www.imf.org/en/Publications/GFSR/Issues/2018/04/02/Global-Financial-Stability-Report-April-2018>; Depository Trust & Clearing Corporation, *The Next Crisis Will Be Different: Opportunities to Continue Enhancing Financial Stability 10 Years After Lehman's Insolvency*, DTCC WORKING PAPER (September 2018), available from <http://www.dtcc.com/news/2018/september/12/new-paper-identifies-post-crisis-opportunities>.

⁶⁴⁸ ESRB Report, *supra* note 490 at 29; see also EUROPEAN CENTRAL BANK, *Counterparty and liquidity risks in exchange-traded funds*, FINANCIAL STABILITY REVIEW, SPECIAL FEATURE C (November 2018), available at https://www.ecb.europa.eu/pub/financial-stability/fsr/special/html/ecb.fsrart201811_3.en.html.

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.”⁶⁵⁰ 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.”⁶⁵¹ ETF arbitrage was shown in this study to “facilitate the propagation of liquidity shocks from the ETFs to the underlying securities.”⁶⁵² 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.”⁶⁵³

Another discovered source of contagion risk in ETFs is in “operational shorting” (OS) by MMs (including APs).⁶⁵⁴ 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.”⁶⁵⁵ 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.”⁶⁵⁶ Further, the study notes that OS activity is “driven by” ETF liquidity mismatch in the underlying assets and the “presence of efficient hedges.”⁶⁵⁷ While OS may serve as a “contrarian form of liquidity provision,”⁶⁵⁸ and may also enhance price discovery, it can generate higher “failures to deliver”⁶⁵⁹ (FTD) which “spillover from one ETF to another within the same AP,

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.

⁶⁵⁴ 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), available at SSRN: <https://ssrn.com/abstract=2961954>.

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.”⁶⁶⁰

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.⁶⁶¹ 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.⁶⁶² 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.”⁶⁶³

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.”⁶⁶⁴ The more complex markets are, “the greater the chance of the unexpected interaction of components.”⁶⁶⁵ Over the last fifty years, financial markets, and available products (including ETFs) in the U.S., have grown tremendously in size, diversity and complexity.⁶⁶⁶ 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

Delivery, <https://www.investopedia.com/terms/f/failuretodeliver.asp> (last visited January 28, 2019).

⁶⁶⁰ Evans et al. *supra* note 654 at 36.

⁶⁶¹ See Thomas Stratmann & John W. Welborn, *Exchange-Traded Funds, Fails To Deliver, and Market Volatility*, GEORGE MASON UNIVERSITY DEPARTMENT OF ECONOMICS, WORKING PAPER NO. 12-59 (2012), available at <http://ssrn.com/abstract=2183251>.

⁶⁶² *Id.*; see also discussion at 6.

⁶⁶³ *Id.* at 6.

⁶⁶⁴ Steven L. Schwarcz, *Regulating Complexity*, *supra* note 522 at 213.

⁶⁶⁵ See Robert F. Weber, *Structural Regulation as Antidote to Complexity Capture*, 49 AM. BUS. L.J. 643, 643 (2012).

⁶⁶⁶ See generally Michael Collins, *Wall Street and The Financialization Of The Economy*, FORBES (February 4, 2015), <https://www.forbes.com/sites/mikecollins/2015/02/04/wall-street-and-the-financialization-of-the-economy/#4f6e026d5783>; See also INVESTOPEDIA, *Financialization*, <https://www.investopedia.com/terms/f/financialization.asp>; see also Hu & Morley, *A Regulatory Framework*, *supra* note 1 at 843.

idea that at first glance seem antithetical to the underlying ethos of securities regulation.⁶⁶⁷

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.⁶⁶⁸ She notes that these unifying factors are driven by four increasingly common financial market “mechanisms”: pooling,⁶⁶⁹ layering,⁶⁷⁰ acceleration,⁶⁷¹ and compression.⁶⁷² The application of these mechanisms are evident in ETF innovation. Consider the wide slate of funds currently offered by Vanguard⁶⁷³ – 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.⁶⁷⁴

As a result of this evolution, a tradable financial instrument represents nearly every real economic interest.⁶⁷⁵ 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.⁶⁷⁶ Nascent product innovation has flourished post-GFC, as evidenced by an increasingly wide variety of new and exotic ETFs.⁶⁷⁷ The universe of available ETF products can be overwhelming⁶⁷⁸ (especially to retail investors) and has grown to include

⁶⁶⁷ 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.

⁶⁶⁸ See Saule T. Omarova, *New Tech v. New Deal: Fintech As A Systemic Phenomenon*, 36 YALE JOURNAL ON REGULATION 735, 741 (2019).

⁶⁶⁹ See *id.* at 762.

⁶⁷⁰ See *id.* at 763.

⁶⁷¹ See *id.* at 764.

⁶⁷² See *id.* at 765.

⁶⁷³ See VANGUARD ETFs, <https://investor.vanguard.com/etf/list#/etf/asset-class/month-end-returns> (last visited September 9, 2019).

⁶⁷⁴ See Omarova *New Tech*, *supra* note 668 at 765-767.

⁶⁷⁵ 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>.

⁶⁷⁶ See generally Robin Greenwood & David Scharfstein, *The Growth of Finance*, 27(2) JOURNAL OF ECONOMIC PERSPECTIVES 3 (2013).

⁶⁷⁷ See generally Robin Wigglesworth, *Worries Over Exotic Exchange Traded Funds Deepen*, FINANCIAL TIMES (February 14, 2018), <https://www.ft.com/content/6c4f40dc-1113-11e8-940e-08320fc2a277>.

⁶⁷⁸ 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,⁶⁷⁹ and managed futures.⁶⁸⁰ A recent report on the ETF market by the *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.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.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.⁶⁸³ When strategies are replicated through new fund structures, these opaque risks “build-up” in the financial system.⁶⁸⁴ The BIS Report identifies the risks being particularly acute for ETFs that create synthetic exposures using derivatives.⁶⁸⁵

Nassim Nicholas Taleb, in his best-selling critique on modern financial institutions *Antifragile*, noted that the “problem of the commercial world is that it only works by addition (*via positiva*), not subtraction (*via negativa*)”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”.⁶⁸⁷

12-20/etfs-use-pets-ai-anything-for-attention-to-crack-tough-market; see also Hu & Morley, *A Regulatory Framework*, *supra* note 1 at 843.

⁶⁷⁹ See Ben Hernandez, *Get Disruptive in 2019 With These 10 ETFs*, ETF TRENDS (January 2, 2019), <https://www.etftrends.com/robotics-ai-channel/get-disruptive-in-2019-with-these-10-etfs/>.

⁶⁸⁰ See Todd Shriber, *Eyeing Alternatives With A Managed Futures ETF*, ETF TRENDS (January 5, 2019), <https://www.etftrends.com/eyeing-alternatives-with-a-managed-futures-etf/>.

⁶⁸¹ See SECURITIES INDUSTRY AND FINANCIAL MARKETS ASSOCIATION, SIFMA INSIGHTS: US ETF MARKET STRUCTURE PRIMER, 5 (September 2018).

⁶⁸² See Srichander Ramaswamy, *Market Structures and Systemic Risks of Exchange Traded Funds*, BANK FOR INTERNATIONAL SETTLEMENTS WORK PAPER NO. 343 (April 2011), available at <https://www.bis.org/publ/work343.pdf>;

⁶⁸³ *Id.* at 1-2

⁶⁸⁴ *Id.*

⁶⁸⁵ *Id.* at 11.

⁶⁸⁶ NASSIM NICHOLAS TALEB, *ANTIFRAGILE: THINGS THAT GAIN FROM DISORDER*, 400 (1st ed. 2014)

⁶⁸⁷ *Id.* at 5.

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.”⁶⁸⁸ 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).⁶⁸⁹ 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.⁶⁹⁰

Critics of modern financial complexity have argued that “financial markets exist primarily to serve themselves”⁶⁹¹ and that complexity has facilitated “rent-seeking” which gets conflated with “creating value.”⁶⁹² 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.”)⁶⁹³ Professor, and Nobel Laureate, Paul Krugman has suggested that modern financial markets create “money for nothing.”⁶⁹⁴ Others, such as Rana Foroohar, go as far as to call it “unproductive finance” and a cause of societal income inequality.⁶⁹⁵ 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.⁶⁹⁶ Further, it allows powerful

⁶⁸⁸ Wallace Turbeville, *A New Perspective On The Costs and Benefits of Financial Regulation: Inefficiency Of Capital Intermediation In A Deregulated System*, 72 MD. L. REV. 1173, 1203 (2013).

⁶⁸⁹ *Id.* at 1177.

⁶⁹⁰ See Carolina Wilson, *As ETF Issuers Crowd Into ESG, Some Investors Say Enough Already*, BLOOMBERG (January 24, 2019), <https://www.bloomberg.com/news/articles/2019-01-24/as-etf-issuers-crowd-into-esg-some-investors-say-enough-already>.

⁶⁹¹ Ezra Wasserman Mitchell, *Financialism A (Very) Brief History*, 43 CREIGHTON L. REV. 323, 323 (2010); see also Lawrence E. Mitchell, *The Morals of the Marketplace: A Cautionary Essay For Our Time*, 20 STAN. J. LAW & POL. 171 (2009).

⁶⁹² See William Lazonick & Mariana Mazzucato, *The Risk-Reward Nexus in the Innovation-Inequality Relationship: Who Takes the Risks? Who Gets the Rewards?* 22(4) INDUSTRIAL AND CORPORATE CHANGE 1093 (2013).

⁶⁹³ Paul Kedrosky & Dane Stangler, *Financialization and Its Entrepreneurial Consequences*, KAUFFMAN FOUNDATION RESEARCH SERIES: FIRM FOUNDATION AND ECONOMIC GROWTH, 8 (March 2011).

⁶⁹⁴ See Paul Krugman, *Money For Nothing*, THE NEW YORK TIMES (April 29, 2009), <https://www.nytimes.com/2009/04/27/opinion/27krugman.html>.

⁶⁹⁵ Rana Foroohar, *The Economy’s Greatest Illness: The Rise of Unproductive Finance*, EVONOMICS (15 November 2016), <http://evonomics.com/financialization-hidden-illness-rana-foorohar/>.

⁶⁹⁶ Jeremy Kidd, *Fintech: Antidote To Rent-Seeking?* 93 CHI. KENT L. REV. 165, 170 (2018).

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.*

⁷⁰⁰ See Hyman P. Minsky, *The Financial Instability Hypothesis*, LEVY ECONOMICS INSTITUTE OF BARD COLLEGE WORKING PAPER NO. 74, 4 (May 1992).

⁷⁰¹ See Stefano Battiston, Guido Caldarelli, Robert M. May, Tarik Roukny, & Joseph Stiglitz, *The Price Of Complexity In Financial Markets*, 113(36) PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, PNAS 10031, 10031-10036 (September 2016), available at <https://doi.org/10.1073/pnas.1521573113>.

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.*

⁷⁰⁵ See Kathryn Judge, *Fragmentation Nodes: A Study in Financial Innovation, Complexity, and Systemic Risk*, 64 STAN. L. REV. 657 (2012).

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.

⁷¹⁴ See Jonathan Brogaard, Terence Hendershott & Ryan Riordan, *High Frequency Trading and Price Discovery*, EUR. CENT. BANK WORKING PAPER SERIES NO. 1602 (2013),

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 distortive 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

<http://ssrn.com/abstract=1928510>; *see also* STAFFS OF THE CFTC AND SEC, FINDINGS REGARDING THE EVENTS OF MAY 6, 2010, 45 (2010),

<http://www.sec.gov/news/studies/2010/marketevents-report.pdf>

⁷¹⁵ *See* Yadav, *supra* note 709 at 1615.

⁷¹⁶ *See* Drew Voros, *High-Frequency Trading Key to ETFs*, ETF.COM (September 25, 2013), <https://www.etf.com/sections/features/19955-high-frequency-trading-key-to-etfs.html>.

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);⁷²³ 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.

⁷²⁴ See Rachel Evans & Emily Barrett, *Fund Blowups Rekindle Doubts About ETF Liquidity in Crisis Times*, BLOOMBERG (July 12, 2019), <https://www.bloomberg.com/news/articles/2019-07-12/panic-sales-rekindle-debate-over-etf-liquidity-in-next-crisis>; see also ESRB Report, *supra* note 6 at 29.

⁷²⁵ Evans & Barrett, *supra* note 724.

⁷²⁶ See WILLIAM F. SHARPE, *PORTFOLIO THEORY AND CAPITAL MARKETS* 77-78 (1970); Eugene Fama, *Efficient Capital Markets: A Review of Theory and Empirical Work*, 25(2) THE JOURNAL OF FINANCE 383 (1970); Sanjay Basu, *Investment Performance of Common Stocks in Relation to Their Price-Earnings Ratios*, 32 J. FIN. 663, 663 (1977); Jeremy C. Stein, *Efficient Capital Markets, Inefficient Firms: A Model of Myopic Corporate Behavior*, 104(4) THE QUARTERLY JOURNAL OF ECONOMICS 655 (1989).

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).

⁷²⁸ See George Akerlof, *Behavioral Macroeconomics and Macroeconomic Behavior*, 92(3) AMERICAN ECONOMIC REVIEW 411 (2002); ROBERTS SHILLER & GEORGE AKERLOF, *PHISHING FOR PHOOLS: THE ECONOMICS OF MANIPULATION AND DECEPTION* (1ST ed. 2015); Paul G. Mahoney, *Market Microstructure and Market Efficiency*, 28 J. CORP. L. 541 (2003).

⁷²⁹ See Razeen Sappideen, *The Paradox of Securities Markets Efficiency: Where To Next?* 2009 SING. J. LEGAL STUD. 80 (2009).

⁷³⁰ See Lynn A. Stout, *The Mechanisms of Market Inefficiency: An Introduction To The New Finance*, 28 J. CORP. L. 635 (2003).

decisions and behavioral “irrationalities”⁷³¹ – a divide that Professor Andrew Lo seeks to bridge through his “adaptive markets hypothesis.”⁷³²

A central critique of passive investing, and particularly ETFs, is that it disincentivizes price discovery for assets that comprise an index or benchmark.⁷³³ The interaction between “markets, market participants, and information” is what drives the price of a security to an “efficient” level.⁷³⁴ 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.”⁷³⁵ 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.⁷³⁶ 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.⁷³⁷

Similar to the belief by some prominent investors that ETFs are creating “illusions” of liquidity,⁷³⁸ 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.⁷³⁹ Billionaire investor Carl Icahn has called the passive investing market a “bubble,” with Jeffrey Gundlach and Jack Bogle

⁷³¹ See Robert Shiller, *From Efficient Markets Theory to Behavioral Finance* 17(1) JOURNAL OF ECONOMIC PERSPECTIVES 90 (2003); HERSH SHEFRIN, BEYOND GREED AND FEAR: UNDERSTANDING BEHAVIORAL FINANCE AND THE PSYCHOLOGY OF INVESTING (1ST ed. 2000); ANDREI SHLEIFER, INEFFICIENT MARKETS (1ST ed. 2000); JOSE A. SCHEINKMAN, SPECULATION, TRADING AND BUBBLES (1ST ed. 2014); Daniel Kahneman & Amos Tversky, *Prospect Theory: An Analysis of Decisions Under Risk*, 47(2) ECONOMETRICA 263 (1979).

⁷³² See ANDREW LO, ADAPTIVE MARKETS: FINANCIAL EVOLUTION AT THE SPEED OF THOUGHT (1ST ed. 2017).

⁷³³ See Roberts, *supra* note 596.

⁷³⁴ Simon Constable, *What is ‘Price Discovery’ and Why Does It Matter?* THE WALL STREET JOURNAL (January 8, 2017), <https://www.wsj.com/articles/what-is-price-discovery-and-why-does-it-matter-1483930860>.

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.

⁷³⁹ Carmen Reinicke, *‘Big Short’ Investor Michael Burry is Calling Passive Investment a ‘Bubble.’ He’s Not The Only Finance Luminary Sounding The Alarm*, MARKET INSIDER (August 29, 2019), https://markets.businessinsider.com/news/stocks/investors-that-have-spoken-out-against-passive-investing-2019-8-1028485512?utm_source=markets&utm_medium=ingest#carl-icahn1.

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.*

⁷⁴¹ See Ben Winck, ‘*Big Short*’ Investor Michael Burry Predicted The Housing Crisis. Now He’s Calling Passive Investment A ‘Bubble,’ MARKET INSIDER (August 28, 2019), https://markets.businessinsider.com/news/stocks/big-short-investor-michael-burry-calls-passive-investment-a-bubble-2019-8-1028481790?utm_source=msn.com&utm_medium=referral&utm_content=msn-slideshow&utm_campaign=bodyurl?utm_source=markets&utm_medium=ingest.

⁷⁴² See Carmen Reinicke, ‘*Big Short*’ Investor Michael Burry Explains Why a Wildly Popular Investment Vehicle Reminds Him of The Rotten Securities That Once Crashed The Economy, MARKET INSIDER (September 4, 2019), <https://markets.businessinsider.com/news/stocks/big-short-investor-michael-burry-compares-index-funds-to-cdos-2019-9-1028497876>.

⁷⁴³ *Id.*

⁷⁴⁴ See Reed Stevenson, *The Big Short’s Michael Burry Explains Why Index Funds Are Like Subprime CDOs*, BLOOMBERG (September 4, 2019), <https://www.bloomberg.com/news/articles/2019-09-04/michael-burry-explains-why-index-funds-are-like-subprime-cdos>.

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.

⁷⁴⁸ See Vladyslav Sushko & Grant Turner, *The Implications of Passive Investing For Securities Markets*, BIS QUARTERLY REVIEW, 114 (March 2018).

⁷⁴⁹ See Jeff Cox, *Passive Investing Automatically Tracking Indexes Now Controls Nearly Half The US Stock Market*, CNBC (March 19, 2019), <https://www.cnbc.com/2019/03/19/passive-investing-now-controls-nearly-half-the-us-stock-market.html>.

⁷⁵⁰ Yun Li, *80% of the Stock Market Is Now On Autopilot*, CNBC (June 29, 2019), <https://www.cnbc.com/2019/06/28/80percent-of-the-stock-market-is-now-on-autopilot.html>.

⁷⁵¹ *Id.*

⁷⁵² See NAIRU CAPITAL, *Michael Burry Is Correct About Passive Investing: Here Is The Proof*, SEEKING ALPHA (August 29, 2019), <https://seekingalpha.com/article/4288578-michael-burry-correct-passive-investing-proof>.

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.⁷⁵⁶ 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.”⁷⁵⁷

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)⁷⁵⁸ and between ETFs with similar benchmarks.⁷⁵⁹ Recent studies further reveal that arbitrage of ETFs, which tracked the S&P 500, led to co-movement of S&P 500 stocks.⁷⁶⁰ 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).⁷⁶¹ It also introduces system-level risk through the possibility of investor simultaneous loss, “synchronized” sell-offs, and company insolvencies.⁷⁶²

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”).⁷⁶³

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

⁷⁵⁶ See Sushko & Turner, *supra* note 748 at 129.

⁷⁵⁷ *Id.* at 119.

⁷⁵⁸ ESRB Report, *supra* note 490 at 2, 19.

⁷⁵⁹ See *id.* at 19.

⁷⁶⁰ See S. Da & S. Shive, *Exchange traded funds and asset return correlations*, 24(1) EUROPEAN FINANCIAL MANAGEMENT 136 (2018); see also Markus Leippold, Lujing Su & Alexandre Ziegler, *How Index Futures and ETFs Affect Stock Return Correlations* (April 24, 2016), unpublished working paper, available at <https://ssrn.com/abstract=2620955>.

⁷⁶¹ Z. Da & S. Shive, S., *ETFs and asset return correlations*, 24(1) EUROPEAN FINANCIAL MANAGEMENT, 136, 136-168 (2018).

⁷⁶² ESRB Report, *supra* note 490 at 2, 19.

⁷⁶³ *Id.* at 19.

tradeable securities due to their being held by a fund sponsor.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.”⁷⁶⁵ As a result, the “information effect” can either reduce or exacerbate “futures price bias.”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.⁷⁶⁷ Recent research also suggests “ETF ownership may be detrimental to firm performance” as it impacts “the relationship between prices and corporate policies.”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.”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.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.⁷⁷¹

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).

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>.

⁷⁶⁶ *Id.* at 26.

⁷⁶⁷ See Constantinos Antoniou, Avaniidhar Subrahmanyam, & Onur Kemal Tosun, *ETF Ownership and Corporate Investment*, HARVARD LAW SCHOOL FORUM ON CORPORATE GOVERNANCE AND FINANCIAL REGULATION (June 28, 2018), <https://corpgov.law.harvard.edu/2018/06/28/etf-ownership-and-corporate-investment/>.

⁷⁶⁸ *Id.*

⁷⁶⁹ See Ricardo Crisostomo & Jorge Medina, *ETFs and Financial Stability; A Compendium of Possible Risk Sources*, CNMV BULLETIN QUARTER IV, 71, 73 (2018).

⁷⁷⁰ See Rickards, *supra* note 587.

⁷⁷¹ *Id.*

The distortive impact of ETFs on underlying asset price formation is not settled.⁷⁷² The *Central Bank of Germany* recently called the relationship between ETF activity and underlying asset prices “inconclusive.”⁷⁷³ There are also additional recent empirical studies that downplay the extent that ETF trading leads to “spillover effects” in underlying assets.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.”⁷⁷⁵

ETFs may also positively contribute to price formation by providing “additive liquidity” in the secondary market.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.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.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.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

⁷⁷² See Asjylyn Loder, *Do Passive Investors Move Markets? They Can*, THE WALL STREET JOURNAL (July 18, 2018), <https://www.wsj.com/articles/etfs-unlikely-to-cause-widespread-market-disruptions-research-shows-1531906200>.

⁷⁷³ See DEUTSCHE BUNDESBANK, *The Growing Importance of Exchange Traded Funds in the Financial Markets*, Monthly Report (October 2018) at 96, available at <https://www.bundesbank.de/resource/blob/766600/2fd3ae4f0593fb2ce465c092ce40888b/mL/2018-10-exchange-traded-funds-data.pdf> (hereinafter “Deutsche Bundesbank ETF Report”).

⁷⁷⁴ See Travis Box, Ryan Davis, Richard B. Evans & Andrew A Lynch, *Intraday Arbitrage Between ETFs and their Underlying Portfolios*, (January 25, 2019), unpublished Working Paper, available at: <https://ssrn.com/abstract=3322400>.

⁷⁷⁵ Deutsche Bundesbank ETF Report, *supra* note 773 at 96.

⁷⁷⁶ *Id.* at 99.

⁷⁷⁷ *Id.* at 96.

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.)

⁷⁷⁹ See generally Ehsan Ahmed et al., *Financialization and Speculative Bubbles - International Evidence*, CAMA WORKING PAPER NO. 6/2017, 6 (December 12, 2016), available at <https://ssrn.com/abstract=2899960>;

ETF index, and its individual constituent securities.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.”⁷⁸¹

In a related study, Ahmed et al. (2017)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.⁷⁸³ Other studies suggest that certain types of financial product innovations may be decreasing market liquidity⁷⁸⁴ while increasing volatility (through “interaction” effects and “flash crashes”).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.”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,⁷⁸⁷ confirming results from previously investigations.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.”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.⁷⁹⁰ Also, this study found that increased volatility in the underlying stocks, brought on by ETF

⁷⁸⁰ ESRB Report, *supra* note 490 at 2, 20-24.

⁷⁸¹ *Id.*

⁷⁸² See Ahmed et al, *supra* note 779.

⁷⁸³ *Id.* at 9.

⁷⁸⁴ See Sunny Oh, *Short interest on junk bond ETFs hits record as investors warn of "liquidity mismatch"*, MARKETWATCH (March 1, 2018), <https://www.marketwatch.com/story/short-interest-on-junk-bond-etfs-hits-record-as-investors-warn-of-liquidity-mismatch-2018-03-01>.

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/>.

⁷⁸⁶ ESRB Report, *supra* note 490 at 20.

⁷⁸⁷ See Itzhak Ben-David, Francesco Franzoni & Rabih Moussawi, *Do ETFs Increase Volatility?* 73(6) JOURNAL OF FINANCE 2471 (2018).

⁷⁸⁸ See Timothy Krause, Sina Ehsani & Donald Lien, *Exchange Traded Funds, Liquidity and Volatility*, 24 JOURNAL OF APPLIED FINANCIAL ECONOMICS 1617 (2014).

⁷⁸⁹ See Ben-David et al. *supra* note 787 at 2471 & 2531.

⁷⁹⁰ *Id.* at 2473.

trading, didn't enhance price discovery,⁷⁹¹ but was distortive "noise".⁷⁹² This suggests ETFs may be making markets less efficient, and potentially increasing systemic risk since the enhanced volatility is "non-diversifiable."⁷⁹³ The ESRB Report supports the information distortive impact of ETFs including the view that "non-fundamental shocks" are integrated into underlying asset prices as a result of ETF trading.⁷⁹⁴

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).⁷⁹⁵ Some of these products appreciate when volatility spikes (for example the *Barclay's 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.⁷⁹⁶ 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.⁷⁹⁷ These products also create counterparty risk, since they are redeemed in large blocks and depend on the creditworthiness of the issuer.⁷⁹⁸ Also, there is empirical evidence of trading volume similarities between volatility related ETPs and volatility futures

⁷⁹¹ See *id.* at 2531.

⁷⁹² *Id.*

⁷⁹³ *Id.*

⁷⁹⁴ See ESRB Report, *supra* note 490 at 22.

⁷⁹⁵ See CBOE VIX, <http://www.cboe.com/vix> (last visited November 4, 2019).

⁷⁹⁶ See Joanna Ossinger, *VIX-Related ETPs Go Wild In After-Hours Trading Route*, BLOOMBERG MARKETS (February 5, 2018), <https://www.bloomberg.com/news/articles/2018-02-05/vix-related-etps-go-wild-in-after-hours-trading-in-wake-of-rout>; see also Hu & Morley, *A Regulatory Framework*, *supra* note 1 at 862-863.

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.")

⁷⁹⁸ See John Waggoner, *Exchange-traded notes add another lawyer of risk*, INVESTMENT NEWS (February 7, 2018), <http://www.investmentnews.com/article/20180207/FREE/180209934/exchange-traded-notes-add-another-layer-of-risk>.

which supports the argument that these products aren't solely a hedge instrument but rather an independent contributor of market volatility.⁷⁹⁹

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

The complexity and opacity of the over-the-counter derivatives market,⁸⁰⁰ and the wholesale and repo markets,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.⁸⁰² There is evidence that complexity and a “glut” of financial intermediation facilitated an “information loss” in the GFC.⁸⁰³ As Professor Manuel Utset has noted, markets are multi-actor “complex institutions” that facilitate price discovery through the aggregation of information;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.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.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.⁸⁰⁷

⁷⁹⁹ See ESRB Report, *supra* note 490 at 24; see also N. P. B. Bollen, M.J. O'Neill & R. E. Whaley, *Tail wags dog: intraday price discovery in VIX Markets*, 37(5) JOURNAL OF FUTURES MARKETS 431 (2017).

⁸⁰⁰ See Stout, *supra* note 730.

⁸⁰¹ See Manuel A. Utset, *Complex Financial Institutions and Systemic Risk*, 45 GA. L. REV. 779 (2011).

⁸⁰² See Daniel Altman, *Contracts So Complex They Imperil The System*, THE NEW YORK TIMES (February 24, 2002), <http://www.nytimes.com/2002/02/24/business/contracts-so-complex-they-imperil-the-system.html>.

⁸⁰³ See Manuel Utset, *Rational Financial Meltdowns*, 10 HASTINGS BUS. L. J. 407 (2014).

⁸⁰⁴ *Id.* at 407.

⁸⁰⁵ See *id.* at 408.

⁸⁰⁶ *Id.* at 424.

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

⁸⁰⁸ *Id.* at 441.

⁸⁰⁹ See Fisher, *supra* note 518 at 485.

⁸¹⁰ *Id.* at 521.

⁸¹¹ *Id.* at 523.

⁸¹² See *id.* discussion at 521-523.

⁸¹³ See *id.*

⁸¹⁴ *Id.* at 524.

⁸¹⁵ See *id.* at 471

⁸¹⁶ See *id.* at 485

runs.⁸¹⁷ It could also decrease contagion,⁸¹⁸ and the spreading of runs to other institutions or asset classes.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.”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’ returns”⁸²¹ rather than an assessment of the “managerial skill” or financial prospectus of the underlying company.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.”⁸²³ It also triggers an analysis of the informational effectiveness of

⁸¹⁷ See FINANCIAL STABILITY BOARD, *Policy Framework for Addressing Shadow Banking Risks in Securities Lending and Repos* (2013); see also Michal Kowalik, *Opacity and Disclosure in Short-Term Wholesale Funding Markets*, FEDERAL RESERVE BANK OF BOSTON WORKING PAPER RPA 16-02, 1 (September 15, 2016)

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, *Fire Sales in a Model of Complexity*, 68(6) THE JOURNAL OF FINANCE 2549 (2013).

⁸¹⁹ Kowalik, *supra* note 817 at 2-7.

⁸²⁰ See CBI Discussion Paper *supra* note 582 at 11.

⁸²¹ See ESRB Report, *supra* note 490 at 22; see also C.P. Clifford, J.A. Fulkerson & B.D. Jordan, B.D., *What drives ETF Flows?* 49(3) FINANCIAL REVIEW 619 (2014).

⁸²² See ESRB Report, *supra* note 490 at 22; see also M. Broman, *Liquidity, style investing, and excess comovement of Exchange-Traded Fund returns*, 30 JOURNAL OF FINANCIAL MARKETS 27 (2016).

⁸²³ See Henry T.C. Hu, *Too Complex To Depict? Innovation, “Pure Information,” And The SEC Disclosure Paradigm*, 90 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.”); *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).”)

adding further disclosure to the already gargantuan requirements that financial product issuers face.⁸²⁴ 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.⁸²⁵

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.⁸²⁶ 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.⁸²⁷ 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.”⁸²⁸

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.⁸²⁹

⁸²⁴ See also Omri Ben-Shahar & Carl E. Schneider, *The Futility of Cost Benefit Analysis in Financial Disclosure Regulation*, UNIVERSITY OF CHICAGO COASE SANDOR INSTITUTE FOR LAW AND ECONOMICS RESEARCH PAPER NO. 680, (January 20, 2014), see discussion at 4; see also Robert P. Bartlett, *Inefficiencies in the Information Thicket: A Case Study of Derivative Disclosures During The Financial Crisis*, 36 J. CORP. L. 1, 57 (2010).

⁸²⁵ See CBI Feedback Statement, *supra* note 566 at 47-48.

⁸²⁶ See Vikas Agarwal, 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 ANNUAL CONFERENCE ON FINANCIAL MARKET REGULATION 2018 (November 20, 2018), available at <https://ssrn.com/abstract=3001524>.

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.⁸³⁰ These disclosures seek to protect investors by creating enhanced transparency and ensuring funds can meet shareholder redemptions. There are regulatory restrictions on ETF illiquid holdings⁸³¹ 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.”⁸³² 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.”⁸³³ Further, they must include cash balance disclosure and eliminate potential gaming behavior when funds classify their holdings into liquidity baskets.⁸³⁴

v. Conclusion

The decline in active investing, and rise in dominance of the passive investing class, has many concerned observers.⁸³⁵ 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.⁸³⁶ 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

⁸³⁰ See U.S. SECURITIES AND EXCHANGE COMMISSION, *SEC Adopts Rules To Modernize Information Reported By Funds, Require Liquidity Risk Management Programs and Permit Swing Programs* (October 13, 2016), <https://www.sec.gov/news/pressrelease/2016-215.html>.

⁸³¹ See SULLIVAN & CROMWELL LLP, *SEC Proposes ETF Rule, Amends Liquidity Risk Reporting Rule and Requires In Line XBRL Reporting By Funds* (July 11, 2018), <https://www.sullcrom.com/files/upload/SC-Publication-SEC-Proposes-ETF-Rule-Amends-Liquidity-Risk-Reporting-Rule-and-Requires-Inline-XBRL-Reporting-by-Funds.pdf>.

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

⁸³⁵ See GRANT’S INTEREST RATE OBSERVER, *On the ETF Divide*, Volume 34, NO. 19b (October 14, 2016), available at http://horizonkinetics.com/wp-content/uploads/Grants_On-The-ETF-Divide.pdf.

⁸³⁶ *Id.*

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

ETFs have positive utility for many investors.⁸³⁹ A market so fertile is driven by real demand, and genuine product benefits include lower costs,⁸⁴⁰ tax advantages⁸⁴¹ and secondary market liquidity.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.⁸⁴³ The ETF ecosystem is a prime example, however, of a complex “layered”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.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,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

⁸³⁷ *Id.*

⁸³⁸ *Id.*

⁸³⁹ See generally Su, *supra* note 485.

⁸⁴⁰ *Id.*

⁸⁴¹ See Mark Kennedy, *ETF Tax Advantages Over Mutual Funds*, THE BALANCE (July 15, 2019), <https://www.thebalance.com/etf-tax-advantages-over-mutual-funds-1215121>.

⁸⁴² See *Understanding ETF Liquidity*, ETF.COM, <https://www.etf.com/etf-education-center/21034-understanding-etf-liquidity.html> (last visited September 9, 2019).

⁸⁴³ See Mohit Oberoi, *A Market Crash Due To ETFs? Michael Burry Weighs In*, MARKET REALIST (September 5, 2019), <https://marketrealist.com/2019/09/market-crash-due-to-etfs-burry-weighs-in/>.

⁸⁴⁴ See Omarova, *supra* note 668 at 763.

⁸⁴⁵ See Conrad de Aenlle, *Opinion: John Bogle Has A Warning For Index Fund Investors*, MARKETWATCH (June 1, 2017), <https://www.marketwatch.com/story/john-bogle-has-a-warning-for-index-fund-investors-2017-06-01>.

⁸⁴⁶ See Fred Imbert, *Passive Investing Boom Could Be Causing A Market Bubble, But Not In The Stocks You Would Expect*, CNBC (July 28, 2019), <https://www.cnbc.com/2019/07/27/passive-investing-boom-could-be-causing-a-market-bubble-but-not-in-the-stocks-you-would-expect.html>.

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 comprised of the "most liquid stocks on the planet," and that index investors are primarily long-run in their investment time horizons.⁸⁴⁷ Relatedly, 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.⁸⁴⁸

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,⁸⁴⁹ Eric Posner and Glenn Weyl,⁸⁵⁰ Robert Litan,⁸⁵¹ and Heather Hughes.⁸⁵² This is

⁸⁴⁷ See Allan Roth, *'The Big Short' Whiffs on Indexing*, ETF.COM (September 5, 2019), <https://www.etf.com/sections/index-investor-corner/big-short-whiffs-indexing?nopaging=1>.

⁸⁴⁸ See Gaia Balp & Giovanni Strampelli, *Preserving Capital Markets Efficiency In The High Frequency Trading Era*, 2018 U. ILL. J.L. TECH. & POL'Y 349, 404.

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.

⁸⁵¹ See Robert E. Litan, *In Defence of Much, But Not All, Financial Innovation*, BROOKINGS INSTITUTE WHITE PAPER (Wednesday February 17, 2010), <https://www.brookings.edu/research/in-defense-of-much-but-not-all-financial-innovation/>.

⁸⁵² See Heather Hughes, *Financial Product Complexity, Moral Hazard, and the Private Law*, 20 STAN. J.L. BUS. & FIN. 179 (2015).

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>.

⁸⁵⁶ See Ashley Lau & Michael Flaherty, *ETF Companies Boost Bank Credit Lines Amid Liquidity Concern*, REUTERS (May 12, 2015), <https://www.reuters.com/article/us-etfs-credit-expansion-insight/etf-companies-boost-bank-credit-lines-amid-liquidity-concern-idUSKBN0NY0A720150513>.

⁸⁵⁷ See FEDERAL REGISTER VOL. 84, NO. 49 (Wednesday March 13, 2019), FINANCIAL STABILITY OVERSIGHT COUNCIL 12 CFR Part 1310, available at <https://home.treasury.gov/system/files/261/Notice-of-Proposed-Interpretive-Guidance.pdf>

⁸⁵⁸ See Richard Berner, Kermit Schoenholtz, Lawrence J. White, *Lowering The Bar on Financial Regulation is Fraught With Risk*, AMERICAN BANKER (June 27, 2019), <https://www.americanbanker.com/opinion/lowering-the-bar-on-financial-regulation-is-fraught-with-risk>.

Chapter IV: Are Exchange Traded Funds Making Some Asset Managers Too Interconnected To Fail?

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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).⁸⁵⁹ 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.⁸⁶⁰ Evidence also supports passive investing providing superior long-run returns.⁸⁶¹ There are concerns, however, that certain ETF issuers may be growing too large.⁸⁶² 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.⁸⁶³ 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.⁸⁶⁴ ETF critics argue that they “shut investors out of the high-growth companies that offer higher returns.”⁸⁶⁵ 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.”⁸⁶⁶

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.⁸⁶⁷ Since 2008, highly interconnected ETF mega firms have increased their influence, and voting power, over nearly every publicly traded corporation in America.⁸⁶⁸ These firms are fostering deep and complex interconnections between market participants

859. See Rachel Evans & Carolina Wilson, *How ETFs Became The Market*, BLOOMBERG (Sept. 13, 2018), <https://www.bloomberg.com/graphics/2018-growing-etf-market/?srd=etfs> [<https://perma.cc/544K-5PKC>].

860. See *infra* Section IV (c).

861. See Eugene F. Fama & Kenneth R. French, *Luck versus Skill in the Cross-Section of Mutual Fund Returns*, 65(5) JOURNAL OF FINANCE 1915 (2010); Ben Johnson, *Active vs. Passively Managed Funds: Takeaways From Our Midyear Report*, MORNINGSTAR BIG PICTURE (Aug. 23, 2018), <https://www.morningstar.com/blog/2018/08/23/actively-managed.html> [<https://perma.cc/W3GC-XET3>].

862. See Elisabeth Dellinger, *Too Big To Fail: Money Management Edition*, FISHER INVESTMENTS MARKET ANALYSIS (Apr. 11, 2014), <https://www.fisherinvestments.com/en-us/marketminder/too-big-to-fail-money-management-edition> [<https://perma.cc/CP8Y-N2FP>].

863. See Eva Su, *Exchange Traded Funds (ETFs): Issues For Congress*, CONGRESSIONAL RESEARCH SERVICE, CRS REPORT (7-5700), 16 (Sept. 24, 2018), available at <https://fas.org/sgp/crs/misc/R45318.pdf> [<https://perma.cc/Z68P-LCFY>].

864. See Lucian A. Bebchuck & Scott Hirst, *The Specter of the Giant Three*, 99 B.U. L. REV. 721, 723 (2019).

865. Keris Lahiff, *Why zero-fee ETFs are not risk free*, CNBC (Mar. 9, 2019), <https://www.cnbc.com/2019/03/09/why-zero-fee-etfs-are-not-risk-free.html> [<https://perma.cc/35MS-TLGG>].

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/J34P-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.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).⁸⁷⁰

Optimal financial market interconnectivity is difficult to assess since interconnections can both absorb and amplify shocks.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.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.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,⁸⁷⁴ and this article will show how a “complementary approach”⁸⁷⁵ is also prudent for the ETF market. The ETF ecosystem highlights the increasing importance of regulating financial markets as a system.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

869. See *infra* Section IV (d).

870. See *infra* Section V.

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 <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”).

872. See *id.* at 3-9.

873. See *infra* Section V.

874. See Jeremy C. Kress, Patricia-Ann McCoy & Daniel B. Schwarcz, *Regulating Entities and Activities: Complementary Approaches to Nonbank Systemic Risk*, 92 S. CAL. L. REV. 1455 (2019).

875. *Id.*

876. See Haldane, *supra* note 871 at 3-5.

system.⁸⁷⁷

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.⁸⁷⁸

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 canvasses 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.⁸⁷⁹ Size is not a

877. See Mark Gilbert, *Banks Get Stress Tested. So Should Asset Managers*, BLOOMBERG OPINION (July 4, 2018), <https://www.bloomberg.com/opinion/articles/2018-07-04/banks-get-stress-tested-so-should-asset-managers> [<https://perma.cc/TEL9-LRTN>], see *infra* Section III.

878. See Dan Awrey, *The Limits of Private Ordering Within Modern Financial Markets*, 34(1) REVIEW OF BANKING & FINANCIAL LAW 183, 234 (2014); Felix B. Chang, *Second-Generation Monopolization: Parallel Exclusion in Derivatives Markets*, 3 COLUM. BUS. L. REV. 657, 695-708 (2016); Nahomy Alvarez & John McPartland, *The concentration of cleared derivatives: Can access to direct CCP clearing for end-users address the challenge?* FEDERAL RESERVE BANK OF CHICAGO WORKING PAPER 2019-06, (Aug. 20, 2019), available at <https://www.chicagofed.org/publications/working-papers/2019/2019-06> [<https://perma.cc/EG22-GCWV>].

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 Professors Schwarcz and Iman

Crisis and Policy Implications, REMARKS AT AMERICAN ECONOMIC ASSOCIATION / AMERICAN FINANCE ASSOCIATION JOINT LUNCHEON, SAN DIEGO, CALIFORNIA (January 4, 2013), available at <https://www.federalreserve.gov/newsevents/speech/files/Yellen20130104a.pdf> [https://perma.cc/L8RV-JCED].

880. See Jonathan R. Macey & James P. Holdcroft, Jr., *Failure Is An Option: An Ersatz-Antitrust Approach To Financial Regulation*, 120 Yale L.J. 1368, 1386-91 (2011).

881. See SYSTEMIC RISK COUNCIL, LETTER TO FINANCIAL STABILITY OVERSIGHT COUNCIL, RE: AUTHORITY TO REQUIRE SUPERVISION AND REGULATION OF CERTAIN NONBANK FINANCIAL COMPANIES, RIN 4030-AA00, (May 21, 2019) available at <https://www.regulations.gov/document?D=FSOC-2019-0001-0029> [https://perma.cc/7FH5-BRR7]; BETTER MARKETS, LETTER TO FINANCIAL STABILITY OVERSIGHT COUNCIL, RE: AUTHORITY TO REQUIRE SUPERVISION AND REGULATION OF CERTAIN NONBANK FINANCIAL COMPANIES, RIN 4030-AA00, 84 Fed. Reg. 9028 (May 24, 2019), available at <https://www.regulations.gov/document?D=FSOC-2019-0001-0030> [https://perma.cc/K2WQ-AYCB]; CENTER FOR AMERICAN PROGRESS, LETTER TO FINANCIAL STABILITY OVERSIGHT COUNCIL, RE: FSOC INTERPRETIVE GUIDANCE ON NONBANK FINANCIAL COMPANY DETERMINATIONS (May 13, 2019) available at <https://www.regulations.gov/document?D=FSOC-2019-0001-0017> [https://perma.cc/C6DY-8WSY]; Patricia McCoy, Jeremy C. Kress, & Daniel Schwarcz, COMMENT OF LEGAL SCHOLARS ON AUTHORITY TO REQUIRE SUPERVISION AND REGULATION OF CERTAIN NONBANK FINANCIAL COMPANIES, RIN 4030-AA40 (May 13, 2019), available at <https://www.regulations.gov/document?D=FSOC-2019-0001-0012> [https://perma.cc/33ZE-TG6L] (hereinafter "Letter from Legal Scholars").

882. See Paul Maidment, *Too Connected to Fail*, FORBES (Apr. 19, 2010), <https://www.forbes.com/2010/04/19/banks-regulation-risk-business-wall-street-notes-on-the-news-connected.html#2c4946285fe7> [https://perma.cc/K2B5-F7NF].

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

884. EUROPEAN CENTRAL BANK, *Recent Advanced in Modelling Systemic Risk Using Network Analysis*, 6 (January 2010), available at <https://www.ecb.europa.eu/pub/pdf/other/modellingsystemicrisk012010en.pdf> [https://perma.cc/Q43P-NKCV].

885. Steven L. Schwarcz, *Systematic Regulation of Systemic Risk*, 2019 WIS. L. REV. 1, 14 (2019).

Anabtawi also note that inherent in all systems are interconnected elements,⁸⁸⁶ 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.⁸⁸⁷

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.⁸⁸⁸ Others suggest that interconnectedness is a key to the complexity (and potential fragility) of today’s financial system.⁸⁸⁹ Douglas Elliot has argued that “[t]he more connections a firm has with others, the more channels there are to transmit problems.”⁸⁹⁰ Several studies have documented how connectivity was present in prior crises.⁸⁹¹ 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.”⁸⁹² 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 1998.⁸⁹³

There are several economic benefits to interconnectedness, including

886. Iman Anabtawi & Steven L. Schwarcz, *Regulating Ex Post: How Law Can Address The Inevitability of Financial Failure*, 92 TEX. L. REV. 75, 78-80 (2013).

887. *Id.* at 84.

888. Alexander Goodenough, *Dodd-Frank: Regulating Systemic Risk in the Offshore Shadow Banking Industry*, 3 GEO. MASON J. INT’L COM. L. 137, 144 (2011).

889. See Cheng-Yun Tsang, *The Seven Deadly Sins of the Contemporary Financial System*, 37 REV. BANKING & FIN. L. 359, 368 (2017); Kathryn Judge, *Interbank Discipline*, 60 UCLA L. REV. 1262, 1306-07 (2013).

890. Douglas Elliot, *Systemic Risk and the Asset Management Industry*, ECONOMIC STUDIES AT BROOKINGS (May 2014), 4, available at https://www.brookings.edu/wp-content/uploads/2016/06/systemic_risk_asset_management_elliott.pdf [<https://perma.cc/L4H5-T7YA>].

891. See Alexander Mehra, *Legal Authority in Unusual and Exigent Circumstances: The Federal Reserve and the Financial Crisis*, 13 U. PA. J. BUS. L. 221, 262 (2010) (identifying the “chain reaction problem” inherent in systemic risk); see also Daniel J. Hunt, *Just Grin and Bear It: Why Consistent Use of Individual Bailouts Under Section 13(3) of the Federal Reserve Act Is A Necessary Evil to Combat Economic ‘Mass Destruction’*, 6 GEO. MASON J. INT’L COM. L. 59, 60 (2014).

892. See Yellen, *supra* note 879.

893. Jorge A. Chan-Lau, *Regulatory Capital Charges for Too-Connected to Fail Institutions* 3 (IMF, Working Paper WP/10/98), <https://www.imf.org/external/pubs/ft/wp/2010/wp1098.pdf> [<https://perma.cc/6KGR-BHBW>].

liquidity, risk diffusion, maturity transformation, and efficient capital intermediation from savers to borrowers;⁸⁹⁴ yet the operations of highly interconnected firms in a crisis can also contribute to panicked selling, and contagion to other asset classes.⁸⁹⁵ Yellen notes that complex interconnections can “serve to amplify existing market frictions, information asymmetries, or other externalities.”⁸⁹⁶ 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.⁸⁹⁷

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,⁸⁹⁸ and impact the entire “financial system.”⁸⁹⁹ When *Lehman Brothers* failed a “shock was transmitted through money market mutual funds to the short-term funding and interbank markets.”⁹⁰⁰ 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.”⁹⁰¹ Similarly, the asset-backed commercial paper market (ABCP) experienced interconnected material distress when “investors reali[z]ed that money market mutual funds had invested in paper backed by sub-prime assets.”⁹⁰² 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.⁹⁰³ Similarly, in money market funds, when the *Reserve Primary Fund* “broke the buck” a wave of redemptions “fueled instability in the credit markets.”⁹⁰⁴

894. See Franklin Allen & Douglas Gale, *Financial Contagion*, 108(1) J. OF POL’Y ECON. 1,4 (2000).

895. Yellen, *supra* note 879.

896. *Id.*

897. See Allen & Gale, *supra* note 894, at 4.

898. European Central Bank, *supra* note 884, at 6.

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.*

904. *Id.*; see Daniel Schwarcz & David Zaring, *Regulation By Threat: Dodd Frank and The Nonbank Problem*, 84 UNI. OF CHICAGO L. REV. 1813, 1828 (2017).

The GFC also showed the speed that healthy but highly interconnected institutions can fail.⁹⁰⁵ During the crisis “interconnected nonbank institutions” took many risks under lowered regulatory parameters.⁹⁰⁶ *Bear Sterns* was deemed too great of a systemic risk, because of its interconnectedness, to let fail (leading to a bail-out).⁹⁰⁷ Yet Bear was smaller than *Lehman Brothers* (which was allowed to fail).⁹⁰⁸ Alan Blinder has suggested that “[t]he primary reason [the Fed saved Bear] was fear that Bear was too interconnected to fail.”⁹⁰⁹ The potential shock transmission from the failure of a highly interconnected AIG made its bail-out a necessity.⁹¹⁰

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.”⁹¹¹ Using “network representations” has been noted by the *Depository Trust & Clearing Corporation* (DTCC),⁹¹² as “particularly suitable” to assess the interconnection of financial institutions.⁹¹³ 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.”⁹¹⁴ The ECB adds that in determining the complexity of a network one

905. See Center For American Progress, *supra* note 881.

906. See Letter from Timothy Geithner, Former Sec’y of the Treasury, Jacob Lew, Former Sec’y of the Treasury, Ben Bernanke Former Chair of the Bd. of Governors of the Fed. Reserve Sys. & Janet Yellen, Former Chair of the Bd. of Governors of the Fed. Reserve Sys., to Steven T. Mnuchin, Sec’y of the Treasury, & Jerome H. Powell, Chair of the Bd. of Governors of the Fed. Reserve Sys. (May 13, 2019), (on file at <https://int.nyt.com/data/documenthelper/887-bernanke-geithner-lew-yellen-letter/a22621b202dfcb0fe06e/optimized/full.pdf> [<https://perma.cc/DP6R-FYJZ>].)

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.

909. ALAN S. BLINDER, AFTER THE MUSIC STOPPED: THE FINANCIAL CRISIS, THE RESPONSE, AND THE WORK AHEAD, at 112-3 (2013)

910. European Central Bank, *supra* note 884, at 7.

911. European Central Bank, *supra* note 884, at 4.

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>].

913. See DEPOSITORY TRUST & CLEARING CORPORATION, UNDERSTANDING INTERCONNECTED RISKS TO BUILD A MORE RESILIENT FINANCIAL SYSTEM, 8 (2015), <http://www.dtcc.com/~media/Files/Downloads/WhitePapers/InterconnectednessWP-101815.pdf> [<https://perma.cc/69Y8-85QR>] (hereinafter “DTCC Whitepaper”).

914. European Central Bank, *supra* note 884, at 4.

must look at both “nodes” (participants on the network) and “links” (connections and relationships).⁹¹⁵ In network analysis the concept of “centrality” is critical to determine which nodes on a given network are “of systemic importance.”⁹¹⁶

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.”⁹¹⁷ Andrew Haldane has noted that this tension is also exhibited in other complex ecosystems, like tropical rainforests,⁹¹⁸ and that after the tipping point the “systemic dislocation” can often be much larger than the “initial shock.”⁹¹⁹ 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.⁹²⁰

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.⁹²¹ When firms engage in interlinked credit exposures (like borrowing from and lending to each other) they deepen the interconnection.⁹²² Credit exposures can also generate interconnectedness when firms hold debt securities that are “issued by other institutions.”⁹²³ Further, some studies indicate that the potential for contagion is enhanced for firms with interlinked credit and leverage exposures.⁹²⁴ This point is relevant to the analysis of the institutional uptake of fixed income ETFs as cash substitutes below.⁹²⁵ Relatedly, a high level of leverage can increase the

915. European Central Bank, *supra* note 884, at 9.

916. European Central Bank, *supra* note 884, at 10.

917. DTCC Whitepaper, *supra* note 913 at 2; for an application of this principle outside of financial markets, in other complex systems, D.J. Watts, S.H. Strogatz, *Collective dynamics of ‘small-world’ networks*, 393(6684) NATURE 440-442 (1998); R. Kinney, P. Crucitti, R. Albert & V. Latora, *Modeling Cascading Failures in the North American Power Grid*, B 46 THE EUR. PHYSICS J. 101 (2005).

918. See Haldane, *supra* note 901, at 2.

919. Haldane, *supra* note 901, at 5.

920. See P. Glasserman & B. Loudis, *A Comparison of U.S. and International Globally Systemically Important Banks*, OFF. OF FIN. RES. BRIEF SERIES 15-07 (2015).

921. See Xavier Freixas, Bruno M. Parigi & Jean-Charles Rochet, *Systemic Risk, Interbank Relations and Liquidity Provision by the Central Bank*, 32 J. OF MONEY, CREDIT AND BANKING 611 (2000).

922. DTCC Whitepaper, *supra* note 913, at 4.

923. DTCC Whitepaper, *supra* note 913, at 5.

924. DTCC Whitepaper, *supra* note 913, at 28.

925. *Infra* Section IV (d)(v).

instability of an interconnected firm.⁹²⁶ 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).⁹²⁷

iii. Complexity of Operations and Transformation Activities

A firm with a complex operating structure will also be highly interconnected.⁹²⁸ This can lead to “coordination problems” amongst firms,⁹²⁹ given an increase in “opacity” of the operations of highly interconnected and complex institutions.⁹³⁰ 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.”⁹³¹ Also, the more complex a firm’s operations, the more difficult it is to resolve.⁹³² Large and complex firms often operate with thousands of separate legal entities, each interconnected to other firms.⁹³³ Research has revealed that the informational opacity in complex financial operations can exacerbate systemic risks like asset “fire sales,”⁹³⁴ and contagion is more likely when there is a high level of connectivity.⁹³⁵ 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.⁹³⁶

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.⁹³⁷ Direct interconnectedness stems from the fact that a contractual default can have a

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.

934. *See* Richard J Caballero & Alp Simsek, *Fire Sales in a Model of Complexity*, (Mass. Inst. of Tech. Dep’t of Econ., Working Paper No. 09-28, 2011).

935. *See* Prasanna Gai, Andrew Haldane & Sujit Kapadia, *Complexity, Concentration and Contagion*, 58 J. OF MONETARY ECON. 453 (2010).

936. *See* FINANCIAL STABILITY BOARD, POLICY RECOMMENDATIONS TO ADDRESS STRUCTURAL VULNERABILITIES FROM ASSET MANAGEMENT ACTIVITIES, 12 (2017), <https://www.fsb.org/2017/01/policy-recommendations-to-address-structural-vulnerabilities-from-asset-management-activities/> [<https://perma.cc/3A92-29YK>] (hereinafter “FSB Structural Vulnerabilities”).

937. *See* DTCC Whitepaper, *supra* note 913, at 12.

material adverse effect on a counterparty.⁹³⁸ Direct interconnectedness can arise from contractual relationships (like service or “infrastructure” agreements), credit exposures or trading links.⁹³⁹ Indirect interconnectedness can originate through contractual relationships due to factors like “information spillovers,”⁹⁴⁰ common asset exposure, fire sales and shadow banking⁹⁴¹ - 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.”⁹⁴²

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.”⁹⁴³ The notion of financial market interdependencies as a source of interconnection-based systemic risk has been documented in research by the DTCC.⁹⁴⁴ 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.⁹⁴⁵ The spread of contagion in a market panic is dependent on a variety of links and interdependencies.⁹⁴⁶ As subsequent sections in this article will highlight, numerous direct and indirect links are being fostered by large ETF sponsors.⁹⁴⁷ 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.”⁹⁴⁸

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.⁹⁴⁹ They are now an

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.

943. European Central Bank, *supra* note 884, at 16.

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).

948. European Central Bank, *supra* note 884, at 16, 18.

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.⁹⁵⁰ 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.⁹⁵¹ Smaller sponsors have been “squeezed out” as the large players compete for valuable *assets under management* (AUM)⁹⁵² which are an independent source of revenue from securities lending.⁹⁵³ 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).⁹⁵⁴ *State Street* is next in line, followed by *Invesco*, *Schwab* and *First Trust*.⁹⁵⁵ 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.⁹⁵⁶ These ETF firms are a continuing focal point for systemic risk “watchdogs.”⁹⁵⁷ Prominent market participants have also started to question the seemingly “endless creation” of ETF products.⁹⁵⁸

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.⁹⁵⁹ It’s effectively become the “biggest investment management company across the globe.”⁹⁶⁰ As the ETF market grows the ETF sponsor space is becoming increasingly concentrated, with new money disproportionately flowing into the largest fund structures.⁹⁶¹

<https://www.cnbc.com/2018/09/14/the-trillion-dollar-etf-boom-triggered-by-the-financial-crisis.html> [https://perma.cc/78NG-Z7Z5].

950. See Su, *supra* note 863.

951. Michael Wursthorn, *The \$4 Trillion ETF Industry is Creating More ‘Roadkill’* THE WALL STREET JOURNAL (Oct. 28, 2019), <https://www.wsj.com/articles/the-4-trillion-etf-industry-is-creating-more-roadkill-11572255004> [https://perma.cc/8NW9-ENS3].

952. *Id.*

953. *Infra* Section IV (c)(vii).

954. See Wursthorn, *supra* note 951.

955. Wursthorn, *supra* note 951.

956. See Su, *supra* note 863, at 16.

957. See Siobhan Riding, *Watchdogs Probe Systemic Risks of Passive Fund Growth*, FINANCIAL TIMES (Mar. 31, 2019), <https://www.ft.com/content/a1deabc2-3eab-11e9-9499-290979c9807a> [https://perma.cc/VFE2-S44U].

958. See Jim Cramer, *We Need To Bring Back Individual Investors*, REAL MONEY (Apr. 23, 2019), <https://realmoney.thestreet.com/investing/stocks/jim-cramer-we-need-to-bring-back-individual-investors-14933853> [https://perma.cc/A584-H3NZ].

959. Trevis Team, *BlackRock’s Revenue Growth Will Slow Down Considerably Over Coming Years*, FORBES (Sept. 18, 2019), <https://www.forbes.com/sites/greatspeculations/2019/09/18/blackrocks-revenue-growth-will-slow-down-considerably-over-coming-years/#2303728d7d79> [https://perma.cc/SNN6-D6FH].

960. Greg McFarlane, *How BlackRock Makes Money*, INVESTOPEDIA (Sept. 24, 2019), <https://www.investopedia.com/articles/markets/012616/how-blackrock-makes-money.asp> [https://perma.cc/48Z2-72V6].

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 500.⁹⁶² Bebchuk 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.”⁹⁶³ Given current trends, they suggest that these firms will “dominate” voting of public companies in the U.S. over time.⁹⁶⁴ This is a staggering proposition, which one reporter recently called “one of the most consequential economic developments of the past 30 years.”⁹⁶⁵

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,⁹⁶⁶ Michael Burry, Carl Icahn, Howard Marks and Robert Shiller who suggest passive investing makes markets less efficient and exhibits characteristics of a “bubble.”⁹⁶⁷

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.⁹⁶⁸ 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.

965. See Andrea Riquier, *Three fund managers may soon control nearly half of all corporate voting power, researchers warn*, MARKETWATCH (Sept. 20, 2019), <https://www.marketwatch.com/story/three-fund-managers-may-one-day-control-nearly-half-of-all-company-voting-shares-researchers-warn-2019-07-17> [<https://perma.cc/7NX7-25QZ>].

966. See Michael Sheetz, *Jeffrey Gundlach Says Passive Investing Has Reached a “Mania” – Investors Should Avoid Index Funds*, CNBC (Dec. 17, 2018), <https://www.cnbc.com/2018/12/17/gundlach-says-passive-investing-has-reached-mania-status.html> [<https://perma.cc/P6WM-4FZL>].

967. Carmen Reinicke, *‘Big Short’ Investor Michael Burry is Calling Passive Investment a “Bubble.” He’s Not The Only Finance Luminary Sounding The Alarm*, MARKETS INSIDER (Aug. 29, 2019), <https://markets.businessinsider.com/news/stocks/investors-that-have-spoken-out-against-passive-investing-2019-8-1028485512> [<https://perma.cc/XX4D-JXQ9>].

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.”⁹⁶⁹ 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.⁹⁷⁰ In addition, recent scandals like the redemption freeze at U.K. based *Woodford Equity Income Fund*, support investor demand for ETFs⁹⁷¹ over actively managed, opened-ended, redeemable funds because of their secondary market liquidity.⁹⁷²

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.⁹⁷³ Another strong argument in support of ETF’s popularity is that they cost less than analogous index mutual or closed end fund structures.⁹⁷⁴ They also have tax advantages over mutual funds.⁹⁷⁵ Additionally (and perhaps most importantly), ETFs are easy to buy in the secondary market.⁹⁷⁶ Although ETFs have features similar to both closed-end funds, and open-ended structures (like mutual funds),⁹⁷⁷ ETF investors don’t

https://www.bis.org/publ/qtrpdf/r_qt1803j.pdf [https://perma.cc/Y64S-LCFF].

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.

970. See Judith Evans & Jonathan Eley, *Democratizing Finance: How Passive Funds Changed Investing*, FINANCIAL TIMES (Jan. 30, 2015), <https://www.ft.com/content/b3c0c960-a56c-11e4-bf11-00144feab7de> [https://perma.cc/B3RW-BLK8].

971. See Athanasios Psarofagis & Eric Balchunas, *Passive Investing Could Emerge as the Winner in the Woodford Troubles*, BLOOMBERG INTELLIGENCE (June 25, 2019), <https://www.bloomberg.com/professional/blog/passive-investing-emerge-winner-woodford-troubles/> [https://perma.cc/Y2ZG-WLKW].

972. See David Tuckwell, *Woodford Saga Shows Why ETF Liquidity Is Worth Paying For*, ETF STREAM (June 11, 2019), https://www.etfstream.com/feature/8073_woodford-shows-why-etf-liquidity-is-worth-paying-for/ [https://perma.cc/3WQF-B2EV]; Matthew Vincent, *Woodford: the self-confessed failings of Hargreaves and the FCA*, FINANCIAL TIMES (Oct. 16, 2019), <https://www.ft.com/content/921894b8-f013-11e9-ad1e-4367d8281195> [https://perma.cc/337R-HTJ8].

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].

974. See Stoyan Bojinov, *Why are ETFs so Much Cheaper Than Mutual Funds*, ETFDB.com, <https://etfdb.com/etf-education/etfs-vs-mutual-funds-why-etfs-are-cheaper/> [https://perma.cc/G52P-7MZN] (last accessed Feb. 1, 2020).

975. See Mark Kennedy, *ETF Tax Advantages Over Mutual Funds*, THE BALANCE (July 15, 2019), <https://www.thebalance.com/etf-tax-advantages-over-mutual-funds-1215121> [https://perma.cc/N6WA-93T7]; see O’Brien, *supra* note 973.

976. See VANGUARD ASSET MANAGEMENT, *Understanding ETF Liquidity and Trading* (2015), available at <https://www.vanguard.nl/documents/understanding-etf-liquidity.pdf> [https://perma.cc/U687-7EBS].

977. See U.S SECURITIES AND EXCHANGE COMMISSION, SUBCOMMITTEE ON ETs AND BOND FUNDS, *Report on the Design of Exchange Trade Funds and Bond Funds – Implications for Fund Investors and Underlying Security Markets Under Stressful Conditions*, 4 (Apr. 10, 2019), available at <https://www.sec.gov/spotlight/fixed-income-advisory-committee/etfs-and-bond->

have the same redemption procedures as mutual fund investors. ETFs can be purchased like stocks through a brokerage account.⁹⁷⁸ This secondary market ETF “liquidity” advantage is a tremendous selling point for investors who are nervous of a mutual fund “redemption freeze.”⁹⁷⁹

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.⁹⁸⁰ In September 2019 the Securities and Exchange Commission (SEC) approved a new rule (*Rule 6c-11*) designed to “streamline the process for offering” ETFs.⁹⁸¹ With Rule 6c-11,⁹⁸² certain ETF issuers will no longer have to obtain exemptive relief from the SEC to launch prescribed funds.⁹⁸³ 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.”⁹⁸⁴

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.⁹⁸⁵ Research suggests that fixed-income and other ETF structures with illiquid underlying assets attract investors

funds-subcommittee-report-041519.pdf [https://perma.cc/3HG5-ED6H] (hereinafter “SEC Subcommittee Report”).

978. See Kennedy, *supra* note 975.

979. See James Seyffart & Eric Balchunas, *Active Mutual Funds More Liquidity Risk in Crisis Than ETFs*, BLOOMBERG INTELLIGENCE (Aug. 12, 2019), <https://www.bloomberg.com/professional/blog/active-mutual-funds-liquidity-risk-crisis-etfs/> [https://perma.cc/8Q5Y-X6TY].

980. See Dave Michaels, *Washington Gives Exchange Traded Funds Fast Lane To Market*, THE WALL STREET JOURNAL (Sept. 26, 2019), https://www.wsj.com/articles/washington-gives-exchange-traded-funds-fast-lane-to-market-11569531983?mod=article_inline [https://perma.cc/P5R5-YUE4].

981. *Id.*

982. U.S. SECURITIES & EXCHANGE COMMISSION, *Press Release, SEC Adopts New Rule To Modernize Regulation of Exchange-Traded Funds* (Sept. 26, 2019), <https://www.sec.gov/news/press-release/2019-190> [https://perma.cc/7NM6-6BHK].

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.⁹⁸⁶ Institutional investors have flocked to ETFs as a new “tool of choice” in the construction of their portfolios,⁹⁸⁷ and institutional investors are increasingly using fixed-income ETFs as “near substitutes for cash” because of their high liquidity.⁹⁸⁸ Other benefits of ETFs to institutional investors include “ease of use.”⁹⁸⁹ 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.⁹⁹⁰ Large ETF firms can also offer institutional investors “liquidity advantages” like more competitive bid-ask spreads.⁹⁹¹

v. Ability to Duplicate Novel Index Structures

The variety of underlying asset class exposure seems nearly limitless with ETFs.⁹⁹² To avoid competing head to head with mega firms, new fund issuers will often devise novel indexes and benchmarks.⁹⁹³ 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.⁹⁹⁴ 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.⁹⁹⁵ As will be discussed below,⁹⁹⁶ the SEC’s

986. See M. Broman, *Relative Liquidity, Style Investing, and Excess Comovement of Exchange Traded Fund Returns*, 30 JOURNAL OF FINANCIAL MARKETS 27 (2016).

987. See Andrew McCollum, *ETFs: U.S. Institutions’ New Tool of Choice For Portfolio Construction*, GREENWICH INSIGHTS (Feb. 27, 2019), <https://www.greenwich.com/asset-management/etfs-us-institutions-new-tool-choice-portfolio-construction> [<https://perma.cc/DQE6-CNY2>].

988. See Marco Pagano, Antonio Sanchez Serrano & Josef Zechner, *Can ETFs Contribute To Systemic Risk?* REPORTS OF THE ADVISORY SCIENTIFIC COMMITTEE NO.9, EUROPEAN SYSTEMIC RISK BOARD (June 2019), 28-29, https://www.esrb.europa.eu/pub/pdf/asc/esrb.asc190617_9_canetfscontributesystemicrisk~983ea11870.en.pdf [<https://perma.cc/9ZJQ-SNNQ>] (hereinafter “ESRB Report”).

989. BROADRIDGE, *Institutional Usage of North America ETFs*, Asset Management Report, 2 (Nov. 2018), available at https://www.broadridge.com/_assets/pdf/broadridge-institutional-usage-of-north-america-etfs.pdf [<https://perma.cc/99ZJ-D5EG>].

990. *Id.* at 2.

991. See Bebchuck & Hirst, *supra* note 864, at 729.

992. See Evans & Eley, *supra* note 970.

993. See Wursthorn, *supra* note 951.

994. See Bebchuck & Hirst, *supra* note 864, at 731.

995. Rachel Evans, *Invesco Seeks SEC Nod for ETF Designed to Thwart Copycats*, BLOOMBERG (Sept. 25, 2019), <https://www.bloomberg.com/news/articles/2019-09-25/invesco-seeks-sec-nod-for-new-etf-designed-to-thwart-copycats> [<https://perma.cc/DRS9-XM59>].

996. See *infra* Section VI(f)(vi).

recent approval of “non-transparent” ETFs helps to alleviate index strategy duplication concerns.⁹⁹⁷

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.⁹⁹⁸ Investor interest in robo-advisors transcend “the millennial set”, and now include much of the retail public.⁹⁹⁹ Some fear that robo-advisors create ETF herding risk;¹⁰⁰⁰ nevertheless, they represent a paradigm shifting “democratization” of wealth management - allowing the masses access to “diversified, affordable investment products” with essentially no account minimums.¹⁰⁰¹ This trend is widely facilitated by demographic changes, technological advancements, and “a shift in investor preferences” to passively managed structures like ETFs.¹⁰⁰² Alongside the emergence of low cost fintech wealth-management,¹⁰⁰³ has been the brokerage commission and ETF fee war, both moving quickly to a zero fee environment.¹⁰⁰⁴ The emergence of robo-advisors may also be increasing ETF issuer concentration, since they often promote widely held ETFs (like Vanguard).¹⁰⁰⁵

997. See U.S. SECURITIES AND EXCHANGE COMMISSION, *Public Statement, Statement of Commissioners Jackson and Lee on Non-Transparent Exchange Traded Funds* (Nov. 15, 2019), <https://www.sec.gov/news/public-statement/statement-jackson-lee-2019-11-15> [<https://perma.cc/873L-4FB4>] (hereinafter “Jackson and Lee”).

998. See Saule T. Omarova, *New Tech v. New Deal: Fintech as a Systemic Phenomenon*, 36 YALE J. ON REG. 735, 788 (2019); Bret E. Strzelczyk, *Rise of the Machines: The Legal Implications For Investor Protection With The Rise of Robo-Advisors*, 16 DEPAUL BUS. & COM. L.J. 55 (2017).

999. See Bryan Yurcan, *U.S. Bank Marketing Robo Adviser Beyond The Millennial Set*, AMERICAN BANKER (June 19, 2018), <https://www.americanbanker.com/news/us-bank-marketing-robo-adviser-beyond-the-millennial-set> [<https://perma.cc/F22C-YCHV>].

1000. See Sheetz, *supra* note 966.

1001. See Evans & Eley, *supra* note 970.

1002. FINEXTRA, *The Democratization of Wealth Management* (June 6, 2016), <https://www.finextra.com/blogposting/12698/the-democratization-of-wealth-management> [<https://perma.cc/BKZ7-Y2HX>].

1003. Low cost fintech access to professional wealth management arguable started with Robinhood; see John Divine, *How Robinhood Changed an Industry*, U.S. NEWS & WORLD REPORT (Oct. 17, 2019), <https://money.usnews.com/investing/investing-101/articles/how-robinhood-changed-an-industry> [<https://perma.cc/77LX-QNB6>].

1004. See Jim Wang, *Free Stock Trades Are Not Always A Good Thing*, FORBES (Oct. 3, 2019), <https://www.forbes.com/sites/jimwang/2019/10/03/free-stock-trades-are-not-always-a-good-thing/#76a987a2687b> [<https://perma.cc/3VHZ-LE5U>]; see also Kirsten Chang, *Battle for client assets heats up as brokers cut fees to zero*, CNBC (Oct. 13, 2019), <https://www.cnbc.com/2019/10/13/battle-for-client-assets-heats-up-as-brokers-cut-fees-to-zero.html> [<https://perma.cc/C3VX-KWSH>].

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>].

vii. AUM As Revenue: Securities Lending and Shadow Banking

ETF issuers have strong growth incentives since “collective investment vehicles” (which includes ETFs) can be used for “shadow banking” activities.¹⁰⁰⁶ The term “shadow banking” (or non-bank lending) is widely associated with the GFC.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.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.¹⁰⁰⁹ Securities lending has been called a “hidden source of return” for ETF fund sponsors,¹⁰¹⁰ even the “best-kept secret in the ETF business.”¹⁰¹¹ Securities lending is not unique to ETFs – it’s been done for decades by other asset managers, like mutual funds and pensions.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),¹⁰¹³ or even pay investors (the so-called “negative fee” funds).¹⁰¹⁴ Securities lending tends to be conducted by more profitable ETFs with underlying stocks which are in higher demand by short sellers.¹⁰¹⁵

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>].

1007. *Id.*

1008. See Robert McDonald & Anna Paulson (2015). *AIG in Hindsight*, 29(2) J. OF ECON. PERSPECTIVES 81, 81-95 (2015).

1009. Cox, *supra* note 1006.

1010. Lewis Braham, *ETFs’ Hidden Source of Return – Securities Lending*, BARRON’S (Apr. 7, 2018), <https://www.barrons.com/articles/etfs-hidden-source-of-returnsecurities-lending-1523054918> [<https://perma.cc/C8WD-UQSD>].

1011. Lara Crigger, *Is Securities Lending Good For ETF Investors?* ETF.COM (Feb. 26, 2018), <https://www.etf.com/sections/features-and-news/securities-lending-good-etf-investors?nopaging=1> [<https://perma.cc/BSE5-6LNE>].

1012. *Id.*

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>].

1014. See Robert C. Lawton, *Investment Funds That Pay You To Invest Are Coming*, FORBES (May 19, 2019, 6:55 AM), <https://www.forbes.com/sites/robertlawton/2019/05/19/investment-funds-that-pay-you-to-invest-are-coming/#67ea1c555c1d> [<https://perma.cc/LUF5-KZZW>] (describing the likelihood of ETFs with “negative expense ratios”); see also Jeff Sommer, *A Price War Has Driven Fund Fees to Zero. They May Be Set To Drop Further*, THE NEW YORK TIMES (Apr. 5, 2019), <https://www.nytimes.com/2019/04/05/business/price-war-fund-fees-zero-negative.html> [<https://perma.cc/57L4-MPAF>] (reporting that the fees associated with ETFs are “on the verge of falling below zero”).

1015. Crigger, *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.¹⁰¹⁶ 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.”¹⁰¹⁷ Given this cost saving advantage these firms can reduce the operational costs of individual funds.¹⁰¹⁸ 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.¹⁰¹⁹

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.¹⁰²⁰ 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.¹⁰²¹ Because indexing is appealing for retail investors,¹⁰²² 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.

1019. JOHN ADAMS, DARREN HAYUNGA & SATTAR MANSI, *Returns to Scale in Active and Passive Management* 27 (Dec. 4, 2018) (unpublished manuscript), 26-7, <https://ssrn.com/abstract=3295799> [<https://perma.cc/6XDS-YY33>].

1020. See CENTRAL BANK OF IRELAND, *Exchange Traded Funds, Discussion Paper* (2017), <https://www.centralbank.ie/docs/default-source/publications/discussion-papers/discussion-paper-6/discussion-paper-6---exchange-traded-funds.pdf?sfvrsn=6> [<https://perma.cc/R5GW-JELR>] (hereinafter “CBI Discussion Paper,” illustrating the operational complexity of an exchange traded fund in both its primary and secondary market structures, and identifying the various participants in the ETF’s operational ecosystem).

1021. For a broad overview of the relationship between financial institution interconnectedness and systemic risk, see DTCC White Paper, *supra* note 913.

1022. Kevin Kelleher, *Here’s Why Small Investors Aren’t Buying The ‘Index Funds Bubble’ Argument*, FORTUNE (Sept. 28, 2019, 6:00 AM), <https://fortune.com/2019/09/28/etf-index-fund-bubble-investors-favor-passive-stock-funds/> [<https://perma.cc/YT6G-BSFR>].

investors,¹⁰²³ it's likely that the market will grow.¹⁰²⁴ As a result, three firms (*BlackRock*, *Vanguard* and *State Street*) will continue to increase in size and influence.¹⁰²⁵ 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.¹⁰²⁶ A simple “physical replication” ETF is created when an “authorized participant” (AP) – which is normally a large broker dealer¹⁰²⁷ - 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).¹⁰²⁸ This is the ETF “primary market,” and retail investors can't transact here.¹⁰²⁹ 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.¹⁰³⁰ The ETF ecosystem also connects other voluntary market participants since APs will sell shares into the secondary market where

1023. Andrew McCollum, *ETFs: U.S. Institutions' New Tool of Choice for Portfolio Construction*, GREENWICH ANALYTICS (Feb. 27, 2019), <https://www.greenwich.com/asset-management/etfs-usinstitutions-new-tool-choice-portfolio-construction> [<https://perma.cc/DQE6-CNY2>].

1024. Lizzy Gurdus, *The \$1 trillion in fixed-income ETFs will double in the next 5 years, says iShares America chief*, CNBC (Sept. 23, 2019, 4:26 PM), <https://www.cnbc.com/2019/09/23/ishares-sees-1-trillion-in-fixed-income-etfs-doubling-in-5-years.html> [<https://perma.cc/ZEN9-SKA6>].

1025. Bebchuck & Hirst, *supra* note 864, at 737-741.

1026. HENRY T.C. HU & JOHN MORLEY, *The SEC and Regulation of Exchange-Traded Funds: A Commendable Start and a Welcome Invitation*, 92 S. CAL. L. REV. 1155, 1995-96 (2019); Henry T.C. Hu & John Morley, *A Regulatory Framework For Exchange Traded Funds*, 91 S. CAL. L. REV. 839, 845 (2018).

1027. See ROCHELLE ANTONIEWICZ & JANE HEINRICHS, *The Role and Activities of Authorized Participants of Exchange Traded Funds*, INVESTMENT COMPANY INSTITUTE REPORT, 1 n.1 (Mar. 2015), https://www.ici.org/pdf/ppr_15_aps_etfs.pdf [<https://perma.cc/6T4V-CFZD>] (“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.”); see also BLACKROCK, *A Primer on ETF Primary Trading and the Role of Authorized Participants* (Mar. 2017), 3, <https://www.blackrock.com/corporate/literature/whitepaper/viewpoint-etf-primary-trading-role-of-authorized-participants-march-2017.pdf> [<https://perma.cc/BSC2-9F2Y>] (BlackRock lists the following examples of “Common U.S. APs” as “Bank of America Merrill Lynch, Citigroup, Credit Suisse, Deutsche Bank, Goldman Sachs & Co., Jeffries, JP Morgan, KCG, Morgan Stanley, UBS Securities, Virtu.”).

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,¹⁰³¹ 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.¹⁰³² The ETF ecosystem connects other participants, such as derivatives dealers, for “synthetic” or other more complex structures (such as inverse or leveraged ETFs).¹⁰³³

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.¹⁰³⁴ There’s emerging evidence that ETF issuers rarely use this power, but frequently side with management, even on controversial issues like executive pay increases.¹⁰³⁵ 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.¹⁰³⁶ 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.”¹⁰³⁷ Therefore, a by-product of the indexing phenomenon is a concentration of voting power over U.S. public companies.¹⁰³⁸ 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.

1032. Hu & Morley, *A Regulatory Framework*, *supra* note 1026, at 851-4.

1033. DEUTSCHE BUNDESBANK, THE GROWING IMPORTANCE OF EXCHANGE TRADED FUNDS IN THE FINANCIAL MARKETS, MONTHLY REPORT, 79, 83 (Oct. 2018), <https://www.bundesbank.de/resource/blob/766600/2fd3ae4f0593fb2ce465c092ce40888b/mL/2018-10-exchange-traded-funds-data.pdf> [<https://perma.cc/KFH5-RVZA>] (hereinafter “DB Report”).

1034. Tim McLaughlin & Ross Kerber, *Special Report: Index Funds Invest Trillions But Rarely Challenge Management*, REUTERS (Oct. 8, 2019, 6:14 AM), <https://ca.reuters.com/article/idCAKBN1WN107-OCABS> [<https://perma.cc/AT7Y-NA2X>].

1035. *Id.*

1036. *Id.*

1037. *Id.*

1038. John C. Bogle, *Bogle Sounds a Warning on Index Funds*, THE WALL STREET JOURNAL (Nov. 29, 2018, 10:15 AM), <https://www.wsj.com/articles/bogle-sounds-a-warning-on-index-funds-1543504551> [<https://perma.cc/YW2H-JBWT>].

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”

1039. *Id.*

1040. YESHA YADAV, *Too-Big-To-Fail Shareholders*, 103 MINN. L. REV. 587, 592-93, 633-36 (2018).

1041. *Id.* at 636.

1042. *Id.* at 621.

1043. *Id.* at 636.

1044. CLAUDE LOPEZ, DONALD MARKWARDT & KEITH SAVARD, *The Asset Management Industry and Systemic Risk: Is There A Connection?*, MILKEN INSTITUTE (Sept. 2016), 27, <https://www.milkeninstitute.org/sites/default/files/reports-pdf/MI-Asset-Management-Industry-Systemic-Risk-WEB.pdf> [<https://perma.cc/GE6B-Q4KC>].

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.”)

1046. Carol J. Loomis, *BlackRock: The \$4.3 Trillion Force*, FORTUNE (July 7, 2014), <https://fortune.com/2014/07/07/blackrock-larry-fink/> [<https://perma.cc/EME7-7HGB>].

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.”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.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.¹⁰⁵²

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.¹⁰⁵³ The *Financial Stability Board* (FSB)¹⁰⁵⁴ has identified ten “non-bank financial entities involved in shadow banking” post GFC in the Americas, including ETF firms.¹⁰⁵⁵ Nonbank lending played a key

& SCOTT HIRST, *The Agency Problems of Institutional Investors*, 31 J. ECON. PERSP. 89, 95 (2017) (describing some sources of an investment management company’s “internal agency problems”); LUCIAN BEBCHUK & SCOTT HIRST, *Index Funds and the Future of Corporate Governance: Theory, Evidence, and Policy*, COLUM. L. REV. (forthcoming 2019) (manuscript at 1), http://ssrn.com/abstract_id=3282794 [<https://perma.cc/YLK5-V7TJ>] (arguing that index fund managers have strong incentives to “defer excessively to the preferences and positions of corporate managers”).

1050. McLaughlin & Kerber, *supra* note 1034.

1051. Brett Christophers, *How Financial Giants Might Come To Rule Us All*, JACOBIN (June 18, 2019), <https://jacobinmag.com/2019/06/blackrock-fairburn-finance-wall-street-vanguard> [<https://perma.cc/4STA-4FHR>].

1052. JOHN C. COATES, *The Future of Corporate Governance Part I: The Problem of Twelve*, HARVARD JOHN M. OLIN DISCUSSION PAPER NO. 1011 (Apr. 2019), 16, http://law.harvard.edu/programs/olin_center/papers/pdf/Coates_1001.pdf [<https://perma.cc/65YK-6U8F>].

1053. See THE ECONOMIST, *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.”)

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, *About the FSB*, <https://www.fsb.org/about/> [<https://perma.cc/QTK7-AGDZ>] (last visited Nov. 4, 2019).

1055. FINANCIAL STABILITY BOARD REGIONAL CONSULTATIVE GROUP FOR THE AMERICAS, *Report on Shadow Banking in the Americas*, 5 (Aug. 22, 2014), https://www.fsb.org/wp-content/uploads/r_140822b.pdf [<https://perma.cc/W4R8-DZM4>].

role in the GFC,¹⁰⁵⁶ particularly by AIG,¹⁰⁵⁷ and the FSOC's non-bank SIFI declaratory power (which will be discussed in detail below) safeguards against this risk.¹⁰⁵⁸ Recent research shows that securities lending by ETF issuers in the U.S. has increased to levels unprecedented since the GFC.¹⁰⁵⁹

Many ETF issuers engage in securities lending.¹⁰⁶⁰ An ETF sponsor can profit by lending a fund's underlying securities to market participants like short-sellers.¹⁰⁶¹ 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.¹⁰⁶² BlackRock has defended against such allegations,¹⁰⁶³ 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.¹⁰⁶⁴ Short selling can also enhance liquidity and price discovery.¹⁰⁶⁵ 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.¹⁰⁶⁶ Securities lending can also create new layers of complexity which may not be "offset" by the generated revenue.¹⁰⁶⁷

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.

1059. Tim McLaughlin & Ross Kerber, *Securities Lending Boom Sparks Concerns on Returns and Voting*, REUTERS (Nov. 7, 2018, 1:06 AM), <https://www.reuters.com/article/us-funds-lending-analysis/securities-lending-boom-sparks-concerns-on-returns-and-voting-idUSKCN1ND0JA> [<https://perma.cc/E9AK-H29P>]; Jessica Tasman-Jones, *SJP Securities Lending More Than Doubles at Blackrock*, PORTFOLIO ADVISER (Aug. 14, 2019), <https://portfolio-adviser.com/sjp-securities-lending-more-than-doubles-at-blackrock/> [<https://perma.cc/RVE9-VR5V>].

1060. Braham, *supra* note 1010.

1061. Braham, *supra* note 1010.

1062. Katerina Petroff & Annie Massa, *Musk Says BlackRock Makes 'Excessive Profit' From Short Lending*, BLOOMBERG (Oct. 5, 2018), <https://www.bloomberg.com/news/articles/2018-10-05/musk-says-blackrock-makes-excessive-profit-from-short-lending> [<https://perma.cc/YMF8-PZH2>].

1063. BLACKROCK, *BlackRock Securities Lending, Unlocking The Potential of Portfolios* (2019), <https://www.blackrock.com/us/individual/literature/brochure/us-retail-securities-lending-brochure.pdf> [<https://perma.cc/6XBX-VLUV>].

1064. See Ross Kerber, *Under fire from Musk, top fund firms defend securities lending*, REUTERS (Oct. 5, 2018), <https://www.reuters.com/article/us-tesla-funds/under-fire-from-musk-top-fund-firms-defend-securities-lending-idUSKCN1MF2JQ> [<https://perma.cc/PHT7-KGMJ>] (detailing how short selling is a net benefit to investors).

1065. See FEDERAL RESERVE BANK OF NEW YORK, *Market Declines: Is Banning Short Selling the Solution?* STAFF REPORT NO. 518, (Sept. 2011) (discussing the market benefits of short selling).

1066. Siobhan Riding, *Fund Groups Challenged Over Securities Lending Practices*, FINANCIAL TIMES (May 11, 2019), <https://www.ft.com/content/62946b2e-1a36-3bd9-9515-f48dfa43b2a> [<https://perma.cc/Y8B5-6W8M>].

1067. Crigger, *supra* note 1011; Attracta Mooney, *Stock Lending By ETF Operators Worries*

v. ETFs as Cash and Money Market Substitutes: Connecting Debtors and Institutional Investors

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).¹⁰⁶⁸ 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.¹⁰⁶⁹ 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.¹⁰⁷⁰

Prior to the GFC, MMMFs were viewed as cash substitutes that paid higher rates than bank deposits;¹⁰⁷¹ 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.¹⁰⁷² 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.¹⁰⁷³ The resulting market panic led to an immediate \$85 billion loan to AIG (to prevent another major institution from failing),¹⁰⁷⁴ and the Fed providing nonrecourse discount window

Investors, FINANCIAL TIMES (Feb. 4, 2018), <https://www.ft.com/content/d4706b0e-e40a-11e7-a685-5634466a6915> [https://perma.cc/JZE9-LW2P].

1068. ESRB Report, *supra* note 988, at 28; Rachel Evans & Emily Barrett, *Fund Blowups Rekindle Doubts About ETF Liquidity In Crisis Times*, BLOOMBERG (July 12, 2019), <https://www.bloomberg.com/news/articles/2019-07-12/panic-sales-rekindle-debate-over-etf-liquidity-in-next-crisis> [https://perma.cc/94T2-TSWL].

1069. Evans & Barrett, *supra* note 1068.

1070. See Chris Dieterich, *ETFs as a Solution For Cash*, BARRON’S (Mar. 6, 2015), <https://www.barrons.com/articles/etfs-as-a-solution-to-cash-1425697664>

[https://perma.cc/274H-YJFR] (explaining the apparent liquidity of ETFs that makes them attractive substitutes for cash and other short-term funds).

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”).

1072. *Id.* at 127-28; Martin Kacperczyk & Philipp Schnabl, *When Safe Proved Risky: Commercial Paper during the Financial Crisis of 2007-2009*, 24(1) J. OF ECON. PERSPECTIVES 29, 34-7 (2010).

1073. Phillip Swagel, *Legal, Political, and Institutional Constraints on the Financial Crisis Policy Response*, 29(2) J. OF ECON. PERSPECTIVES 107, 112-13 (2015); See also Phillip Swagel, *The Financial Crisis: An Inside View*, BROOKINGS PAPERS ON ECONOMIC ACTIVITY (Spring 2009), 40-41; HENRY M. PAULSON, JR., *ON THE BRINK: INSIDE THE RACE TO STOP THE COLLAPSE OF THE GLOBAL FINANCIAL SYSTEM*, 233-34 (New York: Business Plus, 2010)

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).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.¹⁰⁷⁶

ETF mega firms issue cash and MMMF substitutes, like BlackRock’s *iShares Short Term Treasury Bond ETF*.¹⁰⁷⁷ Also, the ETF market has evolved to list “actively managed, ultra-short duration bond ETFs” seeking market share from the MMMF segment.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 *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.”¹⁰⁷⁹

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

& Paulson, *supra* note 1008, at 89.

1075. ALAN S. BLINDER, *AFTER THE MUSIC STOPPED: THE FINANCIAL CRISIS, THE RESPONSE, AND THE WORK AHEAD*, 147-48 (New York: Penguin Group (USA), LLC, 2013); Lorie Logan, William Nelson & Patrick Parkinson, *Novel Lender of Last Resort Programs* (Sept. 2018), 9-11, <https://www.brookings.edu/wp-content/uploads/2018/08/02-Novel-LOLR-Prelim-Disc-Draft-2018.09.11.pdf> [<https://perma.cc/EJ9N-339D>].

1076. Zoltan Pozsar, Tobias Adrian, Adam Ashcraft, and Hayley Boesky, *Shadow Banking*, FEDERAL RESERVE BANK OF NEW YORK STAFF REPORT NO. 458 (July 2010) at 61-64, <http://ssrn.com/abstract=1645337> [<https://perma.cc/8AB9-35K5>]; MORGAN RICKS, *THE MONEY PROBLEM: RETHINKING FINANCIAL REGULATION* (CHICAGO: UNIVERSITY OF CHICAGO PRESS, 2016), 96-101.

1077. iSHARES, *iShares Short Term Treasury Bond ETF*, <https://www.ishares.com/us/products/239466/ishares-short-treasury-bond-etf> [<https://perma.cc/P7EY-FL72>] (last visited Nov. 4, 2019).

1078. Max Chen, *Wary Investors Can Turn To Cash Alternative, Ultra-Short-Duration Bond ETFs*, ETF TRENDS (Feb. 12, 2019), https://www.etftrends.com/fixed-income-channel/wary-investors-can-turn-to-cash-alternative-ultra-short-duration-bond-etfs/?utm_source=Yahoo&utm_medium=referral&utm_campaign=ReadMore [<https://perma.cc/ZN78-SENM>].

1079. See ESRB Report, *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.”)

1080. See Katherine Greifeld, *Cash-Like ETFs See \$3 Billion Exit After Fed Steps Into Market*, BLOOMBERG (Mar. 30, 2020), <https://www.bloomberg.com/news/articles/2020-03-30/fading-funding-squeeze-spurs-3-billion-exit-from-cash-like-etfs> [<https://perma.cc/RD5C-HETJ>].

1081. See Sirio Aramonte & Fernando Avalos, *The recent distress in corporate bond markets: cues from ETFs*, BIS Bulletin No. 6 (Apr. 14, 2020), <https://www.bis.org/publ/bisbull06.pdf> [<https://perma.cc/55S5-ZLR7>].

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.”¹⁰⁸² 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.”¹⁰⁸³ Some feel that holding the entire market indefinitely is an inferior investment strategy to those who actively “rebalance,” adjust allocations, and seek outperformance.¹⁰⁸⁴ 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.¹⁰⁸⁵

The firms that “devise” the underlying index can also have conflicts¹⁰⁸⁶ including threats from China to include their companies in basket compositions.¹⁰⁸⁷ The indexes themselves are susceptible to manipulation,

1082. ESRB Report, *supra* note 988, at 4 n.2.

1083. Ivan Illan, *Passive Portfolios Are A Moral Hazard*, FORBES (Nov. 15, 2018), <https://www.forbes.com/sites/forbesfinancecouncil/2018/11/15/passive-portfolios-are-a-moral-hazard/#6dc717db4d74> [<https://perma.cc/9ATE-NW9D>].

1084. *Id.*

1085. ESRB Report, *supra* note 988, at 4 n.2; *See also* A. Purnanandam, *Originate-to-distribute model and the subprime mortgage crisis*, 24(6) REVIEW OF FINANCIAL STUDIES 1881-1915 (2011) (discussing the originate to distribute model in the global financial crisis and the resulting moral hazard).

1086. *See* Robert J. Jackson & Steven Davidoff Solomon, *What’s Really In Your Index Fund?* N.Y. TIMES (Feb. 18, 2019), <https://www.nytimes.com/2019/02/18/opinion/index-fund.html> [<https://perma.cc/W6ZH-ZQQ8>].

1087. *See* Mike Bird, *How China Pressured MSCI to Add Its Market To Major Benchmark*, THE WALL STREET JOURNAL (Feb. 3, 2019), <https://www.wsj.com/articles/how-china-pressured-msci-to-add-its-market-to-major-benchmark-11549195201> [<https://perma.cc/368N-ZH9S>] (detailing the interaction between index funds, the Chinese government, and the market in China).

which could hurt investors.¹⁰⁸⁸ ETFs can also incentivize risky behavior in other financial institutions. Some ETFs invest in leveraged loans,¹⁰⁸⁹ and numerous ETF companies have recently signalled their intention to enter this market as well.¹⁰⁹⁰ 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.¹⁰⁹¹ 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.¹⁰⁹²

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.”¹⁰⁹³ 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.¹⁰⁹⁴

1088. See Mark DeCambre, *How trillion-dollar stock-market index funds are vulnerable to manipulation that ‘could harm American investors,’* MARKETWATCH (Feb. 20, 2019), <https://www.marketwatch.com/story/how-trillion-dollar-stock-market-index-funds-are-vulnerable-to-manipulation-that-could-harm-american-investors-2019-02-19> [<https://perma.cc/PGA4-MXYC>] (pointing out that the methods used to create index funds are not necessarily aligned with fund value maximization).

1089. See Mayra Rodriguez Valladares, *Big Banks Are Very Exposed To Leveraged Lending and CLO Markets*, FORBES (Apr. 15, 2019), <https://www.forbes.com/sites/mayrarodriguezvalladares/2019/04/15/big-banks-are-very-exposed-to-leveraged-lending-and-clo-markets/#38dd21987309> [<https://perma.cc/DG3J-LKY7>] (demonstrating the growth of leveraged lending and pondering the implications for systemic risk).

1090. See Mayra Rodriguez Valladares, *The SEC Tells Senator Elizabeth Warren That It Is Monitoring CLO Markets*, FORBES (May 6, 2019), <https://www.forbes.com/sites/mayrarodriguezvalladares/2019/05/06/the-sec-tells-senator-elizabeth-warren-that-it-is-monitoring-clo-markets/#7a52a2be2124> [<https://perma.cc/TGF9-C33C>] (identifying the growth in the leveraged loan market along with the concerns that CLO market growth presents for regulation).

1091. See Colby Smith *Who’s Buying Leveraged Loans Anyways?* FINANCIAL TIMES (Nov. 20, 2018), <https://ftalphaville.ft.com/2018/11/20/1542706123000/Who-s-buying-leveraged-loans-anyways/> [<https://perma.cc/5KU8-ZZ3J>] (displaying that the increased demand for leveraged loans is concomitant with a growing liquidity mismatch, exposing investors to increased risk).

1092. *Id.*

1093. ESRB Report, *supra* note 988, at 3.

1094. ESRB Report, *supra* note 988, at 3.

vii. *Connecting Investors and Influencing Herds Due Through Correlated Exposures*

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.”¹⁰⁹⁵ A 2013 report by the OFR (a division of the U.S. treasury)¹⁰⁹⁶ also assessed ETF’s impact on financial stability,¹⁰⁹⁷ and potential contagion selling in underlying assets, especially for ETFs with illiquid assets (like bonds).¹⁰⁹⁸ There is also a “herding” potential that gets exacerbated through ETF duplication as firms look to copy other’s index structures.¹⁰⁹⁹ 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).¹¹⁰⁰ In a crisis, once risks materialize, investors could quickly sell their ETFs.¹¹⁰¹ Another potential scenario is a “run” on a big asset manager (like BlackRock) where all secondary market fund holders simultaneously liquidate their holdings.¹¹⁰² There is also an emerging, and unsettled, debate on the price distortive and volatility enhancing impact of ETFs on underlying securities.¹¹⁰³

Mutual funds holders can interact directly with a mutual fund issuer and redeem their fund units at NAV,¹¹⁰⁴ because of *Investment Company Act*

1095. ESRB Report, *supra* note 988, at 3.

1096. See OFFICE OF FINANCIAL RESEARCH, *About the OFR*, <https://www.financialresearch.gov/about/> [<https://perma.cc/K8WJ-BGQ7>] (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.”

1097. OFFICE OF FINANCIAL RESEARCH, *Asset Management and Financial Stability* (Sept. 2013), https://www.financialresearch.gov/reports/files/ofr_asset_management_and_financial_stability.pdf [<https://perma.cc/Z4B7-7PST>] (hereinafter “OFR Report”).

1098. *Id.* at 10-11.

1099. *Id.* at 9.

1100. Jeff Reeves, *7 ETFs That Act Like A Hedge Fund*, U.S. NEWS & WORLD REPORT (July 18, 2018), <https://money.usnews.com/investing/funds/slideshows/7-etfs-that-act-like-a-hedge-fund> [<https://perma.cc/JN87-4JV4>].

1101. OFR Report, *supra* note 1096, at 11-12.

1102. Dellinger, *supra* note 862.

1103. Compare ESRB Report, *supra* note 988 with Kenekukwu Anadu, Mathias S. Kruttl, Patrick E. McCabe, Emilio Osambela, & Chaehee Shin, *The Shift From Active to Passive Investing: Potential Risks to Financial Stability?* (Sept. 17, 2019), (unpublished manuscript) <https://ssrn.com/abstract=3244467> [<https://perma.cc/Y9NZ-GLYV>].

1104. John Morley, *The Separation of Funds and Managers: A Theory of Investment Fund Structure and Regulation*, 123 YALE L.J. 1228 (2013).

provisions governing open-end management investment companies.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.¹¹⁰⁶

ETF investors can’t transact directly with the fund sponsor to redeem their shares at the underlying NAV.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.”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.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.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.¹¹¹¹ The failure of a large ETF firm, or AP, could “amplify or transmit risks to other parts of the financial system.”¹¹¹² In a “stressed market” an ETF sponsor could face many redemption requests from APs,¹¹¹³ or an AP withdraw, if the value of the secondary market ETFs

1105. 15 U.S.C. §§ 80a-2(a)(32), 5(a)(1) (2012); INVESTMENT COMPANY INSTITUTE, *Frequently Asked Questions About Mutual Fund Share Pricing*, https://www.ici.org/faqs/faq/mfs/faqs_navs [<https://perma.cc/EL8G-PBGJ>].

1106. See Kuhu Parasrampur, *SEC’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.”)

1107. See FIDELITY, *Understanding How Mutual Funds, ETFs and Stocks Trade*, FIDELITY LEARNING CENTER, <https://www.fidelity.com/learning-center/trading-investing/trading/trading-differences-mutual-funds-stocks-etfs> [<https://perma.cc/NL56-2VLH>] (last visited Nov. 4, 2019) (explaining the structure of funds trading).

1108. See Paul Amery, *Will Investors Be Trampled By The Herd?* FINANCIAL TIMES (Sept. 11, 2016), <https://www.ft.com/content/be19405a-652c-11e6-8310-ecf0bddad227> [<https://perma.cc/JPF9-DB76>] (outlining the risks associated with herd behaviour when trading ETF funds).

1109. See Hu & Morley, *A Regulatory Framework*, *supra* note 1026, at 873 (explaining the regulation around structured arbitrage in ETF trading).

1110. Amery, *supra* note 1108.

1111. See OFR Report, *supra* note 1096, at 3.

1112. OFR Report, *supra* note 1096, at 18.

1113. OFR Report, *supra* note 1096, at 12.

deviated significantly from the value of the underlying fund assets.¹¹¹⁴ AP redemption *en mass* could also spread selling pressure to the underlying assets themselves,¹¹¹⁵ and then back to the ETF secondary market in what's been described as a fire sale "feedback loop."¹¹¹⁶

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.¹¹¹⁷ They use third party services like pricing services, benchmark providers, security data providers, custodians, transfer agents, and technology platforms.¹¹¹⁸ Many of these service providers have common clients adding another layer of connectivity.¹¹¹⁹ Service providers in the ETF ecosystem facilitate regulatory compliant back office and settlement operations.¹¹²⁰ Some ETFs also contract "distributors"¹¹²¹ to take orders from the APs and, often, to act as the liaison between the ETFs transfer agent and the APs.¹¹²² In addition to APs, other firms are involved in the operation of an ETF

1114. See Natasha Doff, *Hedge Fund Manager Stakes Own Cash on a Bet Against Credit ETFs*, BLOOMBERG (Nov. 5, 2018), <https://www.bloomberg.com/news/articles/2018-11-05/hedge-fund-manager-stakes-own-cash-betting-credit-etfs-crumble> [<https://perma.cc/3YLB-WVAQ>].

1115. See Ian Foucher & Kyle Gray, *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.")

1116. *Id.*

1117. See OFR Report, *supra* note 1096, at 15.

1118. See BLACKROCK, LETTER TO FINANCIAL STABILITY OVERSIGHT COUNCIL, RE: COMMENTS ON PROPOSED INTERPRETIVE GUIDANCE, AUTHORITY TO REQUIRE SUPERVISION AND REGULATION OF CERTAIN NONBANK FINANCIAL COMPANIES, RIN 4030-AA00 (May 13, 2019), at 47, available at <https://www.blackrock.com/corporate/literature/publication/fsoc-interpretive-guidance-supervision-regulation-certain-nonbank-financial-companies-051319.pdf> [<https://perma.cc/GT9A-YAWK>] (hereinafter "BlackRock Letter to FSOC").

1119. See OFR Report, *supra* note 1096, at 21.

1120. See ETF.COM, *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>].

1121. See KPMG, *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.")

1122. See ETF.com, *supra* note 1120.

including depositories, custodians, record keepers, transfer agents, index providers, exchanges, auditors, legal counsel, and administrators who provide technology, financial, regulatory or operational support.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.”¹¹²⁴ External risk exposure, from service company interconnection can also arise from an ETF mega issuer who offers “ancillary services.”¹¹²⁵

ix. The Interconnective Influence of BlackRock’s “Aladdin” Modelling Program

Another way that BlackRock in particular is connecting the financial system is through its *Aladdin* computer system.¹¹²⁶ A recent *European Banking Institute* study calls *Aladdin* a “financial operating system,” and among “the most consequential and unexamined developments in global finance.”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.¹¹²⁸ There are emerging concerns that the widespread use of *Aladdin* by other market participants is creating systemic risks through correlated investment exposures.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.”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.¹¹³¹ The Federal Reserve also procured the services of BlackRock to manage its *Secondary Market Corporate Credit*

1123. See KPMG, *supra* note 1121.

1124. Elliot, *supra* note 890, at 4.

1125. Elliot, *supra* note 890, at 5.

1126. See BLACKROCK, *An end-to-end portfolio management platform*, <https://www.blackrock.com/aladdin/offerings/aladdin-overview> [<https://perma.cc/B5JG-H8AJ>].

1127. Dirk Andreas Zetsche, William A Birdthistle, Douglas W Arner, & Ross P. Buckley, *Financial Operating Systems*, European Banking Institute (EBI) Working Paper Series No. 58/2020 ((Mar. 1, 2020), available at <https://ssrn.com/abstract=3532975> [<https://perma.cc/GLV6-RUU4>]).

1128. Will Dunn, *Meet Aladdin, The Computer “More Powerful Than Traditional Politics”* NEWSTATESMAN AMERICA (Apr. 6, 2018), <https://www.newstatesman.com/spotlight/2018/04/meet-aladdin-computer-more-powerful-traditional-politics> [<https://perma.cc/8TSY-CKQS>].

1129. See Lawrence White, *HSBC signs deal to use BlackRock’s ‘Aladdin’ software worldwide*, REUTERS (Mar. 21, 2019), <https://www.reuters.com/article/us-hsbc-blackrock/hsbc-signs-deal-to-use-blackrocks-aladdin-software-worldwide-idUSKCN1R21NO> [<https://perma.cc/XD5M-9P8E>].

1130. See Dunn, *supra* note 1128.

1131. Dunn, *supra* note 1128.

Facility in response to the coronavirus, and BlackRock will utilize Aladdin in this capacity, further evidencing its influence.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.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.¹¹³⁴ Industry trends point towards “outsourced solutions” for operational and “back office” functions like “fund administration, accounting and transfer agency.”¹¹³⁵ This connects ETF firms to other service providers, many of whom also have global operations. BlackRock’s *Aladdin Implementation* has been specifically referenced in focusing on a “global operating model.”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 Schwarcz identify two transmission mechanisms: “counterparty” transmission and “asset liquidation.”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.

1132. Dawn Lim, *Federal Reserve Taps BlackRock to Purchase Bonds for the Government*, THE WALL STREET JOURNAL (Mar. 24, 2020), <https://www.wsj.com/articles/federal-reserve-taps-blackrock-to-purchase-bonds-for-the-government-11585085843> [<https://perma.cc/H652-U82Z>].

1133. See BLACKROCK, *Global Impact*, <https://www.blackrock.com/corporate/about-us/global-impact> [<https://perma.cc/97N5-S6HD>] (last visited Nov. 4, 2019).

1134. See VANGUARD, *Fast Facts About Vanguard*, <https://about.vanguard.com/who-we-are/fast-facts/> [<https://perma.cc/95DS-WYGJ>] (last visited Nov. 4, 2019).

1135. See Joy Davey, *Outsourcing: The trend towards outsourced solutions*, LEXOLOGY (Dec. 4, 2019), <https://www.lexology.com/library/detail.aspx?g=4acde1c9-0690-4882-afbd-b7c5a64fce5b> [<https://perma.cc/H9JP-9EXA>].

1136. *Id.*

1137. Kress, McCoy & Schwarcz, *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.¹¹³⁸ 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.¹¹³⁹ 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.¹¹⁴⁰ 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.¹¹⁴¹ Also, in the “flash crash” of 2010 ETF prices diverged significantly from their NAV.¹¹⁴²

Professors Henry Hu and John Morley describe the starting point for ETF generated systemic risk as an impairment of the “expectations of easy exit.”¹¹⁴³ 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.¹¹⁴⁴ APs may halt the process of redeeming or creating ETFs leading the ETFs themselves to trade as closed end

1138. See Satyajit Das, *Scarce Liquidity is a Growing Risk*, BLOOMBERG (June 12, 2018), <https://www.bloomberg.com/opinion/articles/2018-06-12/scarce-liquidity-is-a-growing-risk> [<https://perma.cc/H79Q-6JKJ>].

1139. Claude Lopez, *The Asset Management Industry, Systemic Risk, and Macroprudential Policy*, THE CAPCO INSTITUTE JOURNAL OF FINANCIAL TRANSFORMATION 121 (2018), available at <https://milkeninstitute.org/sites/default/files/reports-pdf/SSRN-id2953076.pdf> [<https://perma.cc/NQ4C-MUVL>].

1140. See International Monetary Fund, *Global Financial Stability Report: Vulnerabilities in a Maturing Credit Cycle* (Apr. 2019), at 50, <https://www.imf.org/en/Publications/GFSR/Issues/2019/03/27/Global-Financial-Stability-Report-April-2019> [<https://perma.cc/5HAW-P97G>]; see also Steve Johnson, *IMF Warns on Risk of Rapid Exits From Emerging Market Assets*, FINANCIAL TIMES (Apr. 10, 2019), <https://www.ft.com/content/12303ac0-5ad7-11e9-939a-341f5ada9d40> [<https://perma.cc/9BPD-R2CT>].

1141. See SEC Subcommittee Report, *supra* note 977 at 23-24; C. Dannhauser, & S. Hoseinzade, *The Transformation of corporate bond investors and fragility: Evidence on mutual funds and ETFs*, WORKING PAPER, VILLANOVA UNIVERSITY (2018), available at <https://www.mtsu.edu/econfin/CaitlinDUpdated.pdf> [<https://perma.cc/PV2U-W6K3>].

1142. See SEC Subcommittee Report, *supra* note 977, at 24-5.

1143. See Hu & Morley, *A Regulatory Framework*, *supra* note 1026, at 843.

1144. See Allen Elstein, *Too Big To Curtail? Index Funds and ETFs Pose Hidden Risks For Unwary Investors*, CONTINGENCIES, AMERICAN ACADEMY OF ACTUARIES (May / June 2018), <http://contingencies.org/too-big-to-curtail-index-funds-and-etfs-pose-hidden-risks-for-unwary-investors/> [<https://perma.cc/HN22-3W2Y>].

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.¹¹⁴⁵ Investors could also look to pre-empt AP departure by shorting ETFs.¹¹⁴⁶

ETFs are an attractive mechanism for “pessimistic” short sellers to “speculate or hedge.”¹¹⁴⁷ ETF short sellers can add to pro-cyclical selling in a crisis,¹¹⁴⁸ 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.”¹¹⁴⁹ 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),¹¹⁵⁰ 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.¹¹⁵¹ 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.¹¹⁵² This could also create a “feedback loop” as coordinated selling drives prices downward in both the ETF secondary and underlying asset markets.¹¹⁵³ This is particularly relevant for the growing segment of institutional

1145. See Mike Bird, *Could ETFs Fall Into A Liquidity Jam?* THE WALL STREET JOURNAL (Mar. 21, 2018), https://www.wsj.com/articles/return-of-volatility-raises-liquidity-question-for-etfs-1521627574?mod=ITP_businessandfinance_0&tesla=y [<https://perma.cc/YZE3-KFZB>]; See FINANCIAL STABILITY OVERSIGHT COUNCIL, *Update on Review of Asset Management Products and Activities* (Nov. 16, 2016) available at, <https://www.treasury.gov/initiatives/fsoc/news/Documents/FSOC%20Update%20on%20Review%20of%20Asset%20Management%20Products%20and%20Activities.pdf> [<https://perma.cc/6GKB-52VT>].

1146. Joanna Ossinger, *JPMorgan Says ETFs Won’t Be The Biggest Victims If Credit Blows Up*, BLOOMBERG (Nov. 9, 2018, 10:40 AM), <https://www.bloomberg.com/news/articles/2018-11-09/jpmorgan-says-etfs-won-t-be-biggest-victims-if-credit-blows-up> [<https://perma.cc/Q98E-RD93>].

1147. See Oleg Deev & Dagmar Linnertova, *The Determinants of ETFs Short Selling Activity*, 109 *PROCEDIA – SOCIAL AND BEHAVIORAL SCIENCES* 669, 669 (2014), <https://www.sciencedirect.com/science/article/pii/S1877042813051653> [<https://perma.cc/97H9-UHKK>].

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.

1150. See Crystal Kim, *Synthetic Shorting With ETFs*, BARRON’S (Febr. 27, 2017), <https://www.barrons.com/articles/synthetic-shorting-with-etfs-1488206009> [<https://perma.cc/F6UJ-52ZS>].

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.¹¹⁵⁴ Relatedly, recent empirical research shows that ETF sell-offs have a greater effect on underlying bond prices than mutual fund sales.¹¹⁵⁵

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.¹¹⁵⁶ APs have no legal obligation, to perform this arbitrage.¹¹⁵⁷ 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."¹¹⁵⁸ 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).¹¹⁵⁹ The Central Bank of Ireland has also noted that a "stress event" at a large AP could impact ETF liquidity.¹¹⁶⁰ If MM or AP firms consolidate,¹¹⁶¹ 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.

1158. The importance of discretionary actors (like APs and market makers) to the continued stability of the ETF ecosystem, and the potential for their withdrawal in a crisis has been noted by several researchers, see Ryan Clements, *New Funds, Familiar Fears: Do Exchange Traded Funds Make Markets Less Stable? Part I, Liquidity Illusions*, 20 HOU. BUS. & TAX L. J. 15 (2020); 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; DTCC Whitepaper, *supra* note 913; Srichander Ramaswamy, *Market Structures and Systemic Risks of Exchange Traded Funds*, BANK FOR INTERNATIONAL SETTLEMENTS WORKING PAPER NO. 343 (Apr. 2011), available at <https://www.bis.org/publ/work343.pdf> [<https://perma.cc/DAB8-55FP>].

1159. See Clements, *supra* note 1158, at 48-55; Mark Carlson, Fed. Res. Bd., 2007-13, A BRIEF HISTORY OF THE 1987 STOCK MARKET CRASH WITH A DISCUSSION OF THE FEDERAL RESERVE RESPONSE IN FINANCE AND ECON DISCUSSION SERIES, DIV. OF RES. STAT. & MONETARY AFFAIRS (Nov. 2006), at 11-2 (relating to arbitrageurs failing to support the portfolio insurance market in the 1987 market crash); see also Howard Marks, *Memo To Oaktree Clients Re: Liquidity* (Mar. 25, 2015), available at <https://www.oaktreecapital.com/docs/default-source/memos/2015-03-25-liquidity.pdf?sfvrsn=2> [<https://perma.cc/W3YJ-DXB2>] (highlighting the failure of discretionary liquidity providers to support the auction rate securities market and the parallels to ETFs).

1160. See CENTRAL BANK OF IRELAND, *Feedback Statement on DP6 – Exchange Traded Funds* (2018), at 11, available at <https://www.centralbank.ie/docs/default-source/publications/discussion-papers/discussion-paper-6/feedback-statement-on-exchange-traded-funds---discussion-paper-6.pdf?sfvrsn=2> [<https://perma.cc/36GQ-HHBF>] (hereinafter "CBI Feedback Statement").

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.¹¹⁶² 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.¹¹⁶³

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,¹¹⁶⁴ citing the “resilience” of discretionary liquidity providers during periods of post-crisis market stress.¹¹⁶⁵ They acknowledge, however, emerging risks in the sector including “highly concentrated” markets for liquidity providers¹¹⁶⁶ and authorized participants.¹¹⁶⁷ 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.¹¹⁶⁸ 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.¹¹⁶⁹ Additionally, the IMF in its April 2019 *Global Financial Stability Report*, highlights the growing risks of liquidity mismatches.¹¹⁷⁰

<https://www.ft.com/content/a1deabc2-3eab-11e9-9499-290979c9807a> [https://perma.cc/2SED-RPZN].

1162. For an analogous application from the GFC that shows how liquidity is “fragile” during a crisis, see Song Han & Dan Li, *The Fragility of Discretionary Liquidity Provision: Lessons From The Collapse Of The Auction Rate Securities Market*, FINANCE AND ECONOMICS DISCUSSION SERIES DIVISIONS OF RESEARCH & STATISTICS AND MONETARY AFFAIRS, FEDERAL RESERVE BOARD (May 2010), available at <https://www.federalreserve.gov/pubs/feds/2010/201050/201050pap.pdf> [https://perma.cc/99XK-77PY].

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

1164. See Huw Jones, *ETFs Pose no Threat To Financial Stability – UK Markets Watchdog*, REUTERS (Aug. 8, 2019), <https://www.reuters.com/article/us-britain-regulator-etf/etfs-pose-no-threat-to-financial-stability-uk-markets-watchdog-idUSKCN1UY190> [https://perma.cc/AC2L-SK6V].

1165. Matteo Aquilina, 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 (Aug. 2019), available at <https://www.fca.org.uk/publication/research/fixed-income-etfs-primary-market-participation-resilience-liquidity-during-periods-stress.pdf> [https://perma.cc/D45Q-V7T7].

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”).¹¹⁷¹ 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.¹¹⁷² 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.¹¹⁷³

iii. Securities Lending Fallout and Counter-Party Default Risk

Securities lending can transmit systemic shocks in several ways.¹¹⁷⁴ Loan collateral could be “mismatched” with lent securities (like equities held against bonds).¹¹⁷⁵ In a crisis the lent securities could deviate in value from the collateral and expose ETF fund holders to loss.¹¹⁷⁶ It’s been reported that BlackRock’s *iShares Core UK Gilts*, an ETF tracking Sterling denominated UK government bonds,¹¹⁷⁷ “has about two-thirds of the fund on loan at any one time and accepts

1171. Dawn Lim & Mischa Frankl-Duval, *In Market Rout, ETFs Are Where The Action Is*, THE WALL STREET JOURNAL (Mar. 15, 2020), <https://www.wsj.com/articles/in-market-rout-etfs-are-where-the-action-is-11584270000> [https://perma.cc/T3A7-LZ2H].

1172. See Aramonte & Avalos, *supra* note 1081.

1173. See Marc Gerstein, *Why Your Supposedly Stable Fixed-Income ETF Fell Off A Cliff*, FORBES (Mar. 23, 2020), <https://www.forbes.com/sites/marcgerstein/2020/03/23/why-your-supposedly-stable-fixed-income-etf-fell-off-a-cliff/#7a1c08bf7ba5> [https://perma.cc/MCV3-KM5Y].

1174. For discussion of how securities lending has transmitted systemic risk in prior financial crises see George Tepe, *Broker Dealer Use of “Idle” Customer Assets: Customer Protection With Sweep Programs and Securities Lending*, 2016 COLUM. BUS. L. REV. 823, 863 (2016); Gary Gorton & Andrew Metrick, *Securitized Banking and the Run on Repo*, 104 J. FIN. ECON. 425 (2012); Tobias Adrian et al, FEDERAL RESERVE BANK OF NEW YORK STAFF REPORTS, REPO AND SECURITIES LENDING (2013), https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr529.pdf [https://perma.cc/7ATU-CWDN].

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.

1177. See iShares Core UK Gilts UCITS ETF, <https://www.ishares.com/uk/individual/en/products/251806/ishares-uk-gilts-ucits-etf?switchLocale=y&siteEntryPassthrough=true> [https://perma.cc/7BN8-V5Q9] (last visited Nov. 9, 2019).

equities and other ETFs as collateral.”¹¹⁷⁸ 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.)¹¹⁷⁹

An ETF firm will also invest cash collateral.¹¹⁸⁰ U.S. rules curtail the level of risk that an ETF firm can take on with their cash collateral investments,¹¹⁸¹ yet a debtor could quickly return the borrowed securities and demand their cash collateral, forcing the lender to liquidate their investments at a loss.¹¹⁸² This problem gets “exacerbated” if the invested securities have decreased in value themselves, or are experiencing liquidity shortages.¹¹⁸³ ETF securities lenders also expose their investors to counter-party risk (with greater exposure for synthetic ETFs).¹¹⁸⁴ Borrowers in a securities lending transaction with an ETF firm could fail in a crisis and the borrowed securities could be difficult to recover.¹¹⁸⁵ 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.¹¹⁸⁶

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.¹¹⁸⁷ This impairs financial stability if counterparties (and the financial system) are under stress, and experiencing concurrent losses.¹¹⁸⁸ It would cause disruption to ETF investors as well because, even though client

1178. Mooney, *supra* note 1067.

1179. See Adam McCullough, *Examining the Risks and Rewards of Securities Lending*, MORNINGSTAR (Dec. 12, 2018), <https://www.morningstar.com/articles/904334/examining-the-risks-and-rewards-of-securities-lending> [<https://perma.cc/77SM-L6T6>].

1180. Mooney, *supra* note 1067.

1181. See McCullough, *supra* note 1179.

1182. See Tepe, *supra* note 1174, at 863.

1183. Tepe, *supra* note 1174, at 863-864.

1184. See Christophe Hurlin, Grégoire Iseli, Christophe Perignon, & Stanley Yeung, *The Counterparty Risk Exposure of ETF Investors*, HEC PARIS RESEARCH PAPER NO. FIN-2014-1050 (Mar. 12, 2019), <https://ssrn.com/abstract=2462747> [<https://perma.cc/LKP2-3NQH>].

1185. See Zoe Van Schyndel, *The Risky Business of Securities Lending*, THE MOTLEY FOOL (Apr. 5, 2017), <https://www.fool.com/investing/general/2008/10/16/the-risky-business-of-securities-lending.aspx> [<https://perma.cc/J6EN-5245>].

1186. See McCullough, *supra* note 1179.

1187. See Charles K. Whitehead, *Regulating For The Next Financial Crisis*, 24 PAC. MCGEORGE GLOBAL BUS. & DEV. L. J. 3, 8 (2011) (discussing the transmission of systemic risk in a “chain reaction” across firms that are interconnected in a financial crisis).

1188. 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 firm’s 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

1189. See BlackRock Letter to FSOC, *supra* note 1118, at 5 (describing the agency nature of ETF issuers).

1190. ESRB Report, *supra* note 988, at 3, 31.

1191. ESRB Report, *supra* note 988, at 8.

1192. ESRB Report, *supra* note 988, at 31.

1193. See Alvarez & McPartland, *supra* note 878, at 11-19; Umar Faruqui, Wenqian Huang & Előd Takáts, *Clearing risks in OTC derivatives markets: the CCP-bank nexus*, BIS QUARTERLY REVIEW (Dec. 2018) 73-90.

1194. ESRB Report, *supra* note 988, at 28.

1195. See ETF.com, *Managing and Avoiding ETF Closures*, <https://www.etf.com/etf-education-center/21032-managing-and-avoiding-etf-closures.html> [https://perma.cc/4QKE-J7LL] (last visited Nov. 4, 2019).

the market could lead to fire sales.¹¹⁹⁶ Such an event can induce a form of “prisoners dilemma”¹¹⁹⁷ where investors rush to sell their funds (of any issuer) because they are unaware of the financial status of a particular ETF issuer.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.¹¹⁹⁹ This is also an example of what Andrew Haldane describes as fragility onset through “homogeneity” in financial product holdings.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.¹²⁰¹ As Haldane notes, homogenized financial systems can be unpredictable in a crisis, since diversity strengthens the “durability” of the whole system.¹²⁰²

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.”¹²⁰³ With ETFs, speculators can trade across multiple markets “unhinged” from the intrinsic value of the constituent securities.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).¹²⁰⁵ Further, ETFs attract “directional traders” like HFT to take positions on entire asset classes, which both increases the volatility of constituent securities,¹²⁰⁶ and can drive investor “directional”

1196. See ESRB Report, *supra* note 988, at 31.

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).

1198. See ESRB Report, *supra* note 988, at 31.

1199. See Postlewaite & Vives, *supra* note 1197, at 485-486.

1200. See Haldane, *supra* note 901, at 3-4, 9-10.

1201. Haldane, *supra* note 901, at 3-4, 9-10.

1202. Haldane, *supra* note 901, at 9-10.

1203. Thomas, *supra* note 866.

1204. See Ayan Bhattacharya and Maureen O’Hara, *Can ETFs Increase Market Fragility? Effect of Information Linkages in ETF Markets* (Apr. 17, 2018), Working Paper, <https://ssrn.com/abstract=2740699> [<https://perma.cc/4J2G-2LNF>].

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).

1206. See I. Ben-David, F. Franzoni, F. & R. Moussawi, *Do ETFs increase volatility?* 73(6) J. OF FIN., 2471 (2018).

behavior.¹²⁰⁷

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.”¹²⁰⁸ ETFs that use leverage or “rule-based trading strategies” have procyclical potential.¹²⁰⁹ A bear market sell-off in ETFs could also generate a collective fire-sale in the underlying assets.¹²¹⁰ A “stress event” affecting a large AP or market maker could also trigger an ETF investor herd.¹²¹¹ Similarly the failure of the arbitrage mechanism could drive a coordinated fire-sale and other debilitating “chain reactions.”¹²¹² 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,¹²¹³ similar to a bank run,¹²¹⁴ 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.”¹²¹⁵ 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.¹²¹⁶ 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.

1208. See OFR Report, *supra* note 1096, at 10; Alessandro Beber, Michael W. Brandt & Kenneth A. Kavajecz, *Flight-to-Quality or Flight-to-Liquidity? Evidence from the Euro-Area Bond Market*, 22 REV. FIN. STUD. 925, 926 (2009).

1209. See ESRB Report, *supra* note 988, at 22-3.

1210. See Hu & Morley, *A Regulatory Framework*, *supra* note 1026, at 851-6; Hu & Morley, *A Welcome Invitation*, *supra* note 1026, at 1157-62.

1211. See CBI Feedback Statement, *supra* note 1160 at 11.

1212. See ESRB Report, *supra* note 988, at 2, 22-23, 28.

1213. ESRB Report, *supra* note 988, at 31.

1214. For an exploration of the behaviors of depositors in a bank run see Douglas W. Diamond & Philip H. Dybvig, *Bank Runs, Deposit Insurance, and Liquidity*, 91 J. OF POL. ECON. 401 (1983).

1215. Carlo Svaluto Moreolo, *Systemic Risk Debate Intensifies*, INTELLIGENCE ON EUROPEAN PENSIONS AND INSTITUTIONAL INVESTMENTS (Nov. 2019), <https://www.ipe.com/analysis/systemic-risk-debate-intensifies/www.ipe.com/analysis/systemic-risk-debate-intensifies/10034171.fullarticle> [https://perma.cc/S6TP-E2S8].

1216. *Global Financial Stability Report: Lower For Longer*, INTERNATIONAL MONETARY FUND (Oct. 2019), <https://www.imf.org/en/Publications/GFSR/Issues/2019/10/01/global-financial-stability-report-october-2019> [https://perma.cc/T347-EXU3].

during periods of stress.”¹²¹⁷ ETFs have also become increasingly exotic in variety.¹²¹⁸ 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.¹²¹⁹

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

Large ETF issuers also offer mutual funds.¹²²⁰ 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.¹²²¹ 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.¹²²² Fixed income funds have also been shown in one study to act similarly due to being evaluated based on “relative performance.”¹²²³ Thus similar performing funds could facilitate coordinated redemption requests across fund companies.¹²²⁴

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 fire-sales of firm shares cause an underpricing of the firms, they tend to respond with

1217. *Id.* at 3-4.

1218. See William Baldwin, *Exotic ETFs: 11 Funds For When Tracking The S&P 500 Isn't Good Enough*, FORBES (Dec. 4, 2018), <https://www.forbes.com/sites/baldwin/2018/12/04/exotic-etfs-11-funds-for-when-tracking-the-sp-500-isnt-good-enough/#37e15cce6f83> [https://perma.cc/CPM2-4AYT] (describing Faber's eleven choices for exchange-traded funds and their risky, exotic nature).

1219. ESRB Report, *supra* note 988, at 20.

1220. See BLACKROCK, *What are Mutual Funds?* <https://www.blackrock.com/us/individual/education/mutual-funds> [https://perma.cc/X6ZQ-6MYA] (last visited Nov. 21, 2019) (listing a few large ETF issuers and the mutual fund options they offer).

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/ee03cb4a-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).

1223. Michael Feroli, Anil K. Kashyap, Kermit Schoenholtz, & Hyun Song Shin, *Market Tantrums and Monetary Policy*, (U. of Chi. Booth Sch. of Bus., Working Paper No. 101, 2014).

1224. See Antonio Falato, Ali Hortacsu, Dan Li & Chaehee Shin, *Fire-Sale Spillovers in Debt Markets* 108 JOURNAL OF FINANCIAL ECONOMICS 392 (2016), <https://ssrn.com/abstract=2887822> [https://perma.cc/U5BL-YBAS] (noting how flows of funds in mutual funds tend to mirror peers).

a correspondingly lower level of investment and employment than their industry competitors.¹²²⁵ 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).¹²²⁶ 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.¹²²⁷ Also, trading flows in corporate bonds can impact new corporate debt issuance decisions.¹²²⁸

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.¹²²⁹ 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 SIFIs¹²³⁰ 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

FSOC¹²³¹ was created by The *Dodd Frank Wall Street Reform and Consumer Protection Act* (DFA)¹²³² for several aims, including to “identify risks

1225. See Harald Hau & Sandy Lai, *Real Effects of Stock Underpricing*, 108 JOURNAL OF FINANCIAL ECONOMICS 392 (2013).

1226. Olivier Dessaint & Thierry Foucault & Laurent Frésard & Adrien Matray, *Noisy Stock Prices and Corporate Investment*, SWISS FINANCE INSTITUTE 18-73 (2018), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2707999 [<https://perma.cc/JZ9H-XCU3>].

1227. *Id.*

1228. See Qifei Zhu, *Capital Supply and Corporate Bond Issuances: Evidence From Mutual Fund Flows* (May 2018), (unpublished PhD thesis, University of Texas at Austin), <https://repositories.lib.utexas.edu/bitstream/handle/2152/65970/ZHU-DISSERTATION-2018.pdf?sequence=1> [<https://perma.cc/F86D-T5D3>].

1229. See generally ESRB Report, *supra* note 988; OFR Report, *supra* note 1096; FSB Structural Vulnerabilities, *supra* note 936.

1230. Financial Stability Oversight Council 12 CFR Part 1310, Vol. 84 No. 49, 9028 (2019) <https://home.treasury.gov/system/files/261/Notice-of-Proposed-Interpretive-Guidance.pdf> [<https://perma.cc/89D8-MQAB>] (hereinafter “FSOC Proposed Rules”).

1231. See FINANCIAL STABILITY OVERSIGHT COUNSEL, *About FSOC*, <https://www.treasury.gov/initiatives/fsoc/about/Pages/default.aspx> [<https://perma.cc/Z8UN-79X4>] (last visited Jan. 1, 2020) (describing the duties and purpose of FSOC).

1232. Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203, §

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.”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.”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.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.”¹²³⁶ These standards are more onerous than a standard non-bank’s “baseline regulatory regime.”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.”¹²³⁸

In 2013, *American International Group, Inc.* (AIG), *General Electric Capital Corporation, Inc.* (GE), and *Prudential Financial, Inc.* (Prudential) were designated non-bank SIFIs,¹²³⁹ followed by a similar declaration for *Metlife, Inc.* (Metlife) in 2014.¹²⁴⁰ In 2016 FSOC de-designated GE after the firm altered its risk profile and sold off certain assets.¹²⁴¹ This was followed by AIG being de-designated in 2017 after undertaking similar activities.¹²⁴² Metlife had initially sued FSOC over its status,¹²⁴³ and won in district court by shrinking its insurance

113, 124 Stat. 1376, 1398 (2010) (codified at 12 U.S.C. § 5323(a) (2017)).

1233. 12 U.S.C. § 5321 (2012).

1234. U.S. DEPARTMENT OF THE TREASURY, FINANCIAL STABILITY OVERSIGHT COUNCIL, *Designations*, <https://www.treasury.gov/initiatives/fsoc/designations/Pages/default.aspx> [https://perma.cc/86R8-AXSR] (last visited Oct. 5, 2019) (hereinafter “FSOC Designations”).

1235. 12 U.S.C. § 5323 (2012).

1236. Jeremy C. Kress, *The Last SIFI: The Unwise and Illegal Deregulation of Prudential Financial*, 71 STAN. L. REV. ONLINE 171, 172 (2018), <https://review.law.stanford.edu/wp-content/uploads/sites/3/2018/12/71-Stan.-L.-Rev.-Online-Kress.pdf> [https://perma.cc/NYD3-LNSF]; see also 12 U.S.C. § 5365(b)(1) (2012).

1237. *Id.* at 173.

1238. Kress, McCoy & Schwarcz, *supra* note 874, at 1474.

1239. See FSOC Designations, *supra* note 1234.

1240. FSOC Designations, *supra* note 1234.

1241. FINANCIAL STABILITY OVERSIGHT COUNCIL, BASIS FOR THE FINANCIAL STABILITY OVERSIGHT COUNCIL’S RESCISSION OF ITS DETERMINATION REGARDING GE CAPITAL GLOBAL HOLDINGS, LLC (2016).

1242. FINANCIAL STABILITY OVERSIGHT COUNCIL, NOTICE AND EXPLANATION OF THE BASIS FOR THE FINANCIAL STABILITY OVERSIGHT COUNCIL’S RESCISSION OF ITS DETERMINATION REGARDING AMERICAN INTERNATIONAL GROUP, INC. (2017).

1243. Ryan Tracy, *U.S. Judge Questions MetLife ‘Systemically Important’ Designation*, THE WALL STREET JOURNAL (Feb. 17, 2016), <https://www.wsj.com/articles/u-s-judge-questions-metlife-systemically-important-designation-1455747900> [https://perma.cc/6KB7-BCKU].

business.¹²⁴⁴ In early 2018, FSOC withdrew its appeal against Metlife.¹²⁴⁵ The final institution to shed the label of a non-bank SIFI was Prudential, which was de-designated in 2018.¹²⁴⁶

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.”¹²⁴⁷ Before proceeding with a designation, FSOC will also perform a cost-benefit analysis (CBA), and only proceed if the benefits outweigh the possible costs.¹²⁴⁸ It’s highly unlikely the FSOC’s revised framework will capture asset managers like ETF firms.¹²⁴⁹ Therefore, despite their size, growth, and complex interconnectedness none of the “giant three,”¹²⁵⁰ even the largest of all - BlackRock -¹²⁵¹ 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,¹²⁵² and Vanguard, who lauded the FSOC’s changes.¹²⁵³ Both firms have battled the “too big to fail” label for most of the decade.¹²⁵⁴ They strongly rejected previous

1244. Pete Schroeder, *MetLife, U.S. regulators agree to set aside legal fight*, REUTERS (Jan. 18, 2018), <https://www.reuters.com/article/us-usa-metlife-fsoc/metlife-u-s-regulators-agree-to-set-aside-legal-fight-idUSKBN1F8064> [<https://perma.cc/R8C5-GB5M>].

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/2JPU-ELXH>].

1246. FINANCIAL STABILITY OVERSIGHT COUNCIL, NOTICE AND EXPLANATION OF THE BASIS FOR THE FINANCIAL STABILITY OVERSIGHT COUNCIL’S RESCISSION OF ITS DETERMINATION REGARDING PRUDENTIAL FINANCIAL, INC. 2 (2018).

1247. FSOC Proposed Rules, *supra* note 1230, at 9028.

1248. FSOC Proposed Rules, *supra* note 1230, at 9029

1249. *See* Richard Berner, Kermit Schoenholtz & Lawrence J. White, *Lowering The Bar on Financial Regulation is Fraught With Risk*, AMERICAN BANKER (June 27, 2019), <https://www.americanbanker.com/opinion/lowering-the-bar-on-financial-regulation-is-fraught-with-risk> [<https://perma.cc/LCN5-FNL7>].

1250. Bebchuck & Hirst, *supra* note 864.

1251. *See* Loomis, *supra* note 1046.

1252. CAMPAIGN FOR ACCOUNTABILITY, *New Report Details How BlackRock Fought Off Government Regulation by Spending Big in Washington* (Sept. 5, 2019), <https://blackrocktransparencyproject.org/2019/09/05/new-report-details-how-blackrock-fought-off-government-regulation-by-spending-big-in-washington/> [<https://perma.cc/FKD3-NLPK>].

1253. *See* BlackRock Letter to FSOC, *supra* note 1118; VANGUARD, LETTER TO FINANCIAL STABILITY OVERSIGHT COUNCIL, RE: AUTHORITY TO REQUIRE SUPERVISION AND REGULATION OF CERTAIN NONBANK FINANCIAL COMPANIES; RIN 4030-AA00 (May 13, 2019), <https://www.regulations.gov/document?D=FSOC-2019-0001-0013> [<https://perma.cc/6ED5-EHWK>] (hereinafter “Vanguard Letter to FSOC”).

1254. *See* Sheila Bair, *Is BlackRock Too Big To Fail?* FORTUNE (Dec. 4, 2013), <https://fortune.com/2013/12/04/is-blackrock-too-big-to-fail/> [<https://perma.cc/5K9L-PX89>]; Douglas Holtz-Eakin & Satya Thallam, *What Happens If Investment Funds Are Labeled ‘Too Big to Fail’?* FORBES (June 19, 2014), <https://www.forbes.com/sites/realspin/2014/06/19/what-happens-if-investment-funds-are-labeled-too-big-too-fail/#6bc5acde5bb>

suggestions by the OFR,¹²⁵⁵ in a 2013 report that they posed a “too big to fail” systemic risk.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.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;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.¹²⁵⁹ BlackRock in particular has ushered extensive support for a “products and activities” approach to addressing risks in asset management.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,

[<https://perma.cc/569Y-82X9>].

1255. U.S. DEPARTMENT OF TREASURY, OFFICE OF FINANCIAL RESEARCH, <https://www.financialresearch.gov/> [<https://perma.cc/Y73U-HCDE>] (last visited Oct. 5, 2019).

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>].

1257. Douglas Holtz-Eakin & Satya Thallam, *What Happens If Investment Funds Are Labeled ‘Too Big to Fail’?* FORBES (June 19, 2014), <https://www.forbes.com/sites/realspin/2014/06/19/what-happens-if-investment-funds-are-labeled-too-big-too-fail/#6bc5acede5bb> [<https://perma.cc/QM7M-75F4>].

1258. BlackRock, *Comments on Consultative Document for Proposed Policy Recommendations To Address Structural Vulnerabilities For Asset Management Activities*, Sept. 21, 2016, <https://www.blackrock.com/corporate/literature/publication/fsb-structural-vulnerabilities-asset-management-activities-092116.pdf> [<https://perma.cc/3J5J-D53F>] (hereinafter “BlackRock FSB Letter”).

1259. Ryan Tracy and Sarah Krouse, *One Firm Getting What It Wants In Washington: BlackRock*, THE WALL STREET JOURNAL (Apr. 20, 2016), <https://www.wsj.com/articles/one-firm-getting-what-it-wants-in-washington-blackrock-1461162812> [<https://perma.cc/NYJ7-P83S>].

1260. Barbara Novick, *Agnostic on non-banks?* OeNB Macroprudential Policy Conference, 13 (2019), <https://www.blackrock.com/corporate/literature/publication/barbara-novick-remarks-oenb-macroprudential-policy-conference-050919.pdf> [<https://perma.cc/RLY9-VJHE>].

because it acts as an “agent” or “advisor” on behalf of its investors.¹²⁶¹ BlackRock submits that its role is a “provider of services” for a fee.¹²⁶² 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.¹²⁶³ An ETF firm’s assets are not acquired through leverage (unlike bank deposits),¹²⁶⁴ and an asset manager doesn’t have access to “central bank liquidity.”¹²⁶⁵ The largest ETF issuers use significantly less leverage than deposit taking banks.¹²⁶⁶ Also, if an ETF issuer failed, an ETF’s underlying assets could be transferred to a new custodian.¹²⁶⁷ 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.”¹²⁶⁸ This argument, however, is weakened for asset managers that “invest on behalf of clients as well as themselves.”¹²⁶⁹

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.¹²⁷⁰ 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?¹²⁷¹ 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.¹²⁷²

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.

1265. Novick, *supra* note 1260, at 6.

1266. Lopez, *supra* note 1139, at 125.

1267. Joshua S. Wan, *Systemically Important Asset Managers: Perspectives on Dodd-Frank’s Systemic Designation Mechanism*, 116 COLUM. L. REV. 805, 826 (2016).

1268. BlackRock FSB Letter, *supra* note 1258, at 3.

1269. Moreolo, *supra* note 1215.

1270. Lopez, *supra* note 1139, at 126.

1271. DTCC Whitepaper, *supra* note 913, at 12.

1272. BlackRock Letter to FSOC, *supra* note 1118, at 31.

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

1273. BlackRock FSB Letter, *supra* note 1258, at 3.

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.

1279. Blinder, *supra* note 909, at 147-48; Logan, Nelson & Parkinson, *supra* note 1075, at 9-11; Paulson, *supra* note 907, at 233-42; Geithner *supra* note 1071, at 194-7.

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. Schwarcz & 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.¹²⁸⁷ 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.¹²⁸⁸

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.¹²⁸⁹ Second, ETFs can act as “vehicles of price discovery” for underlying assets,¹²⁹⁰ particularly for illiquid underlying like fixed income and high yield bond ETFs.¹²⁹¹ 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 2015.¹²⁹² 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.¹²⁹³

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.¹²⁹⁴ Given the revised guidance, it seems unlikely that an asset manager will be legally labeled a non-bank SIFI.¹²⁹⁵ Former Treasury

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.

1291. SEC Subcommittee Report, *supra* note 977; BlackRock, *Viewpoint Bond ETFs, Benefits, Challenges, Opportunities* (July 2015), <https://www.blackrock.com/corporate/literature/whitepaper/viewpoint-bond-etfs-benefits-challenges-opportunities-july-2015.pdf> [<https://perma.cc/U5TD-LH93>].

1292. Seyffart & Balchunas, *supra* note 979.

1293. BlackRock Letter to FSOC, *supra* note 1118, at 27.

1294. Better Markets, *supra* note 881.

1295. Nellie Liang, *A risky mix: Looser financial regulations when monetary policy is easing*, BROOKINGS INSTITUTE (Oct. 5, 2019), <https://www.brookings.edu/blog/up-front/2019/10/15/a-risky-mix-looser-financial-regulations-when-monetary-policy-is-easing/> [<https://perma.cc/NKE3-J69N>].

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.”¹²⁹⁶ Numerous commentators and academics view “activity” and “entity” oversight as “complementary” rather than “substitutive.”¹²⁹⁷ Others suggest a “tailored” approach to regulating systemically important non-banks.¹²⁹⁸ 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.¹²⁹⁹ 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.¹³⁰⁰ *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).¹³⁰¹ 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.¹³⁰² 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.¹³⁰³ They also note (citing economist Frank H. Knight’s “unknowables” concept) that systemic risk predictions require “quantitative

1296. Geithner et al., *supra* note 906.

1297. 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), <https://www.regulations.gov/document?D=FSOC-2019-0001-0027> [<https://perma.cc/MP2T-BCPF>]; Letter from Legal Scholars, *supra* note 881; Kress, McCoy, & Daniel B. Schwarcz, *supra* note 874.

1298. Richard Berner, Kermit Schoenholtz, Lawrence J. White, *Lowering The Bar on Financial Regulation is Fraught With Risk*, AMERICAN BANKER (June 27, 2019), <https://www.americanbanker.com/opinion/lowering-the-bar-on-financial-regulation-is-fraught-with-risk> [<https://perma.cc/A9R3-PEFG>].

1299. FSOC Proposed Rules, *supra* note 1230, at 9035.

1300. *See infra* Section V(vi).

1301. *Better Markets*, *supra* note 881.

1302. Jeremy Kress, *The Case Against Activity-Based Financial Regulation*, COLUMBIA LAW SCHOOL BLUE SKY BLOG (Nov. 16, 2017), <http://clsbluesky.law.columbia.edu/2017/11/16/the-case-against-activity-based-financial-regulation/> [<https://perma.cc/B8CD-68HF>].

1303. *Id.*; Kress, McCoy & Schwarcz, *supra* note 874, at 1463.

projections” which are impossible.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.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.¹³⁰⁶ This is why the FSOC designation power was designed in the first place – to give a “pre-emptive” tool that can only work *ex ante* (Geithner *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.”)¹³⁰⁷

ii. The Speed of Interconnection Generated Contagion and Distress Transmission

The activities-based framework requires CBA prior to making an entity designation.¹³⁰⁸ *Better Markets* in its submission to FSOC states that this requirement makes a designation “almost impossible as a practical matter.”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.¹³¹⁰ Interconnectedness can serve as a “conduit for contagion.”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.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.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”

1304. See Kress, McCoy & Schwarcz, *supra* note 874, at 1483; FRANK K. KNIGHT, RISK, UNCERTAINTY AND PROFIT 6, 214–15, 224–25 (Dover Publ’ns Inc. 2006) (1921).

1305. Geithner *et al.* *supra* note 906.

1306. Kress, McCoy & Schwarcz, *supra* note 874, at 1483.

1307. Geithner *et al.* *supra* note 906.

1308. FSOC Proposed Rules, *supra* note 1230, at 9034.

1309. *Better Markets*, *supra* note 881.

1310. *Better Markets*, *supra* note 881.

1311. DTCC Whitepaper, *supra* note 913, at 4.

1312. Kress, McCoy & Schwarcz, *supra* note 874, at 1486.

1313. John C. Coates IV, *Cost Benefit Analysis of Financial Regulation: Case Studies and Implications*, 124 YALE L. J. 882, 1010-11 (2015).

and based on “pragmatic” design.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.¹³¹⁵ They suggest this timeline is “unworkable” given the speed that the GFC materialized.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.”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.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.”¹³¹⁹ This is because market crises take place in a “complex, adaptive network” which is characterized by financial and non-financial “interconnections.”¹³²⁰ This is relevant to ETFs given the numerous market participants in a complex operating ecosystem.

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.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,¹³²² and in

1314. Jeffrey N. Gordon, *The Empty Call For Benefit-Cost Analysis in Financial Regulation*, 43 J. LEGAL STUD. S351, S353, S366-S368 (2014).

1315. Geithner et al. *supra* note 906.

1316. Geithner et al. *supra* note 906.

1317. Geithner et al. *supra* note 906.

1318. *See infra* Section IV(i)(d).

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 *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. *See* Haldane, *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.”)

1320. Haldane, *supra* note 901, at 1.

1321. *See infra* Section IV.

1322. Kress, *supra* note 1236.

the case of an ETF issuer, this would be the SEC.¹³²³ Under the revised guidance the FSOC will use “informal measures” to influence other regulators; however, these measures are non-binding,¹³²⁴ and the process of seeking harmony creates logistical complexity, coordination costs and litigation risks.¹³²⁵ The FSOC’s powers, under an activities-based framework, have thus been criticized as akin to those of “a glorified think tank.”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.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.

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.”¹³²⁸ Further, Professors Kress, McCoy and Schwarcz 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.”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 *Lehman* and *Bear Stearns*, from repo agreements and commercial paper to MBS.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.¹³³¹

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

1323. See Wan, *supra* note 1267, at 810 (noting the Commission’s role as a primary regulator in the ETF context).

1324. See 12 U.S.C. § 5330(c)(2) (noting such a distinction).

1325. Geithner et al. *supra* note 906.

1326. Kress, McCoy & Schwarcz, *supra* note 874, at 1463.

1327. Kress, McCoy & Schwarcz, *supra* note 874, at 1505-1506.

1328. Geithner et al. *supra* note 906.

1329. See Kress, McCoy & Schwarcz, *supra* note 874, at 1462 (noting the inherent blind spots present in an activities-based approach).

1330. Kress, McCoy & Schwarcz, *supra* note 874, at 1462.

1331. See Kress, McCoy & Schwarcz, *supra* note 874, at 1489-1492 (further discussing the limitations of an activities-based framework).

1332. Geithner et al. *supra* note 906.

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.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.”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”¹³³⁵ and the growth of the mega ETF firms (combined with the complex interconnectedness factors cited above)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.”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.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.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.

1333. Kress, McCoy & Schwarcz, *supra* note 874, at 1463.

1334. See Gregg Gelzins, *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).

1335. DTCC Whitepaper, *supra* note 913 at 2.

1336. *Supra*, Section IV (d).

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).

1338. See Robert F. Weber, *The FSOC's Designation Program as a Case Study of the New Administrative Law of Financial Supervision*, 36 YALE J. ON REG. 359 (2019) (discussing such deficiencies).

1339. *Id.*

i. Understanding and Monitoring AP Discretionary Incentives

As noted above,¹³⁴⁰ 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.¹³⁴¹ 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,¹³⁴² 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.¹³⁴³ 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.¹³⁴⁴

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.¹³⁴⁵ Despite being seen by some as undermining the "notice-and-comment" process,¹³⁴⁶ the authors suggest threat based regulation is particularly useful when "risks are hard to identify" and "perils of mistake are great."¹³⁴⁷ 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.¹³⁴⁸

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).

1344. *See* Stanislav Dolgoplov, *A Two-Sided Loyalty? Exploring The Boundaries of Fiduciary Duties of Market Makers*, 12 U.C. DAVIS BUS. L.J. 31, 32 (2011) (discussing such incentives).

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.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.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,¹³⁵¹ the volatility¹³⁵² and co-movement of underlying asset prices between themselves¹³⁵³ (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.¹³⁵⁴ Interestingly, AP withdraw and ETF investor panic respectively mirrors the “hide” or “flight” phenomenon in epidemiology in relation to behavioral responses to disease.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.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

(2006).

1349. *Infra* Section IV(ii)(b).

1350. FSB Structural Vulnerabilities, *supra* note 936, at 9-10.

1351. See ESRB Report, *supra* note 988, at 19-22 (presenting such factors depicting this impact).

1352. See Ben-David et al., *supra* note 1206.

1353. See Z. Da & S. Shive, *ETFs and asset return correlations*, 24(1) EUROPEAN FINANCIAL MANAGEMENT 136 (2018).

1354. ESRB Report, *supra* note 988, at 2-3.

1355. Haldane, *supra* note 901, at 7.

1356. ESRB Report, *supra* note 988, at 2-3, 32.

segment of the industry to monitor going forward.¹³⁵⁷ This is a market that has experienced significant U.S. and international post-GFC growth.¹³⁵⁸ Risky sub-classes of the fixed income ETF market, like emerging market debt, and high yield, are also growing.¹³⁵⁹

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.¹³⁶⁰ The ominous near-reality of intermediated capital markets overseers – essentially “ruling on capital’s behalf” – is the path ETFs investors find themselves on.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.¹³⁶² Also, indexing creates a gatekeeping function making asset managers stewards of the economy as a whole.¹³⁶³ Professor John Coates calls this the “greatest concentration of economic control in our lifetimes.”¹³⁶⁴ BlackRock has signaled intentions to use their influence to enact climate change initiatives.¹³⁶⁵ Asset manager proxy voting control has systemic implications, and will require policy

1357. See SEC Subcommittee Report, *supra* note 977, (discussing such rationale).

1358. See SEC Subcommittee Report, *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.”)

1359. See SEC Subcommittee Report, *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.”).

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*, BARRON’S (Aug. 23, 2016), <https://www.barrons.com/articles/advisors-cash-is-king-amid-uncertainty-51546881439> [<https://perma.cc/NH3F-ZKF7>].

1361. See Christophers, *supra* note 1051.

1362. See David McLaughlin & Annie Massa, *The Hidden Dangers of the Great Index Fund Takeover*, BLOOMBERG BUSINESSWEEK (Jan. 9, 2020), <https://www.bloomberg.com/news/features/2020-01-09/the-hidden-dangers-of-the-great-index-fund-takeover> [<https://perma.cc/RQ3L-4LBD>] (discussing the various dangers attributed to prominent ETF issuers).

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 . . .”).

1364. See Coates, *supra* note 1052.

1365. See Steven Mufson & Rachel Siegal, *BlackRock makes climate change central to its investment strategy*, THE WASHINGTON POST (Jan. 14, 2020), <https://www.washingtonpost.com/business/2020/01/14/blackrock-letter-climate-change/> [<https://perma.cc/XKT2-4VBB>].

attention.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.

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.¹³⁶⁷ As a result, regulation should at least enhance the "resilience" of financial firms that are most centrally interconnected.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."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.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.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

1366. See Coates, *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.)

1367. DTCC Whitepaper, *supra* note 913, at 10.

1368. DTCC Whitepaper, *supra* note 913, at 11.

1369. 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) available at: https://scholarship.law.columbia.edu/faculty_scholarship/2604 [https://perma.cc/G9AB-U532].

1370. See Mark Gilbert, *Banks Get Stress Tested. So Should Asset Managers*, BLOOMBERG OPINION (July 4, 2018), <https://www.bloomberg.com/opinion/articles/2018-07-04/banks-get-stress-tested-so-should-asset-managers> [https://perma.cc/TEL9-LRTN].

1371. See Douglas W. Arner, János Barberis & Ross P. Buckley, *FinTech, RegTech, and the Reconceptualization of Financial Regulation*, 37 NW. J. INT'L L. & BUS. 371 (2017).

adjustments to “old-fashioned disclosure” rather than “hi-tech disclosure solutions.”¹³⁷² 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.¹³⁷³ 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).¹³⁷⁴

vi. The New Challenge of Non-Transparent ETFs

As noted, the SEC recently approved four applications for “non-transparent” ETFs.¹³⁷⁵ 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).¹³⁷⁶ It’s believed that APs can perform the arbitrage function through the proxy portfolio,¹³⁷⁷ and those in support of this development suggest that it will promote more active management, which will improve market efficiency.¹³⁷⁸ Further, advocates say that concealing fund compositions allows for more competition in the market and mitigates the poaching of novel index strategies.¹³⁷⁹ Yet there are numerous uncertainties about how these structures will affect market stability. True arbitrage is risk-free, or guaranteed.¹³⁸⁰ If an AP doesn’t know an index’s exact composition it can’t ensure true arbitrage.¹³⁸¹ If transparent plain-vanilla ETF structures risk arbitrage breakdown, surely non-transparent structures are even more precarious.

1372. See Erik F. Gerding, *Disclosure 2.0: Can Technology Solve Overload, Complexity, and Other Information Failures?* 90 TUL. L. REV. 1143, 1149 (2016).

1373. See Haldane, *supra* note 871, at 7.

1374. See Erik F. Gerding, *Code, Crash, and Open Source: The Outsourcing of Financial Regulation to Risk Models and the Global Financial Crisis*, 84 WASH. L. REV. 127 (2009).

1375. See Jackson and Lee, *supra* note 997.

1376. Jackson and Lee, *supra* note 997.

1377. Jackson and Lee, *supra* note 997.

1378. See Bailey McCann, *What To Know About ‘Nontransparent’ ETFs*, THE WALL STREET JOURNAL (May 5, 2019), <https://www.wsj.com/articles/what-to-know-about-nontransparent-etfs-11557108061> [https://perma.cc/FF99-EP6U].

1379. See Andrea Riquier, *What is a ‘non-transparent’ ETF, and why would anyone want to own one?* MARKETWATCH (Dec. 11, 2019), <https://www.marketwatch.com/story/get-ready-for-a-new-flavor-of-etf-non-transparent-2019-11-15> [https://perma.cc/3WH5-2WFN].

1380. See Philip H. Dybvig, and Stephen A. Ross, *Arbitrage*, in THE NEW PALGRAVE DICTIONARY OF ECONOMICS: VOLUME 1–8, 188–197 (2d ed. 2008).

1381. See Jackson and Lee, *supra* note 997, at footnote 6.

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.¹³⁸² Index creation is subject to very little regulatory oversight.¹³⁸³ 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.¹³⁸⁴ 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.¹³⁸⁵

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.¹³⁸⁶ History lends caution when illiquid underlying assets are synthesized into instantly liquid financial products.¹³⁸⁷ 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).¹³⁸⁸ Deposit insurance, and central banks acting as "lenders of last resort," curb bank run and systemic risks.¹³⁸⁹ This

1382. See Jackson & Solomon, *supra* note 1086.

1383. See DeCambre, *supra* note 1088.

1384. See Bird, *supra* note 1087.

1385. See Adriana Robertson, *Passive in Name Only: Delegated Management and 'Index Investing'*, 36 YALE J. ON REG. 795 (2019).

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-808d194ffb75> [<https://perma.cc/C3HM-MMWX>].

1387. See Daniel Zwirn, 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* (Apr. 29, 2019) (unpublished manuscript), available at SSRN: <https://ssrn.com/abstract=3379979> [<https://perma.cc/6U8Q-QN8X>].

1388. *Id.* See also Stephen Gandel, *There's a Time Bomb Bigger Than the VIX in the Market*, BLOOMBERG OPINION (Feb. 7, 2018), <https://www.bloomberg.com/news/articles/2018-02-07/there-s-a-time-bomb-bigger-than-the-vix-in-the-market> [<https://perma.cc/ZK9Y-57M4>] ("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.")

1389. See Steven L. Schwarcz, *Systemic Risk*, 97 GEO. L.J. 193, 210, 225 (2008).

“extraordinary” government support has not been “normally” available to other firms,¹³⁹⁰ and represents a social “cost” of the intermediation, liquidity and maturity transformation services that a bank provides.¹³⁹¹

The MMMF crisis showed, however, that the government was willing to support “shadow deposits” in the GFC.¹³⁹² As a result, the MMMF market now benefits from an “implicit” guarantee of emergency government support.¹³⁹³ Like MMMFs, ETFs also offer liquidity transformation by turning less liquid (often bespoke) loans into cash substitutes.¹³⁹⁴ In an unprecedented move to mitigate the economic fallout from the coronavirus,¹³⁹⁵ on March 23, 2020 the Federal Reserve established the *Secondary Market Corporate Credit Facility* with authorization to purchase investment grade corporate ETFs.¹³⁹⁶ 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,¹³⁹⁷ their popularity has also spawned complex interconnected ETF mega firms, with growing influence over the decisions of nearly every publicly traded corporation in America.¹³⁹⁸ In many ways ETFs are a “tragedy of the commons” problem where what’s good for the individual is sub-optimal for the group.¹³⁹⁹ Empirically there’s a “real prospect” that these ETF firms will one day have voting control over all large publicly traded companies in America.¹⁴⁰⁰ These mega ETF sponsors are growing to an unprecedented size,¹⁴⁰¹ 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.

1393. See William A. Birdthistle, *Breaking Bucks in Money Market Funds*, 2010 WIS. L. REV. 1155, 1163, 1190.

1394. See *supra* Section IV(d)(v).

1395. See Andrea Riquier, *The Fed is Going to Buy ETFs. What Does It Mean?* MARKETWATCH (Mar. 30, 2020), <https://www.marketwatch.com/story/the-fed-is-going-to-buy-etfs-what-does-it-mean-2020-03-23> [<https://perma.cc/S5Y8-5VZQ>].

1396. Board of Governors of the Federal Reserve System, *Policy Tools, Secondary Market Corporate Credit Facility*, <https://www.federalreserve.gov/monetarypolicy/smccf.htm> [<https://perma.cc/T6DH-YCJL>].

1397. See *supra* Section IV(c).

1398. See *supra* Section IV(d)(ii).

1399. See Conrad de Aenlle, *Opinion: John Bogle has a warning for index fund investors*, MARKETWATCH (June 1, 2017), <https://www.marketwatch.com/story/john-bogle-has-a-warning-for-index-fund-investors-2017-06-01> [<https://perma.cc/49EU-WLS5>].

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->

deep and complex interconnections.¹⁴⁰² 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.¹⁴⁰³ 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.¹⁴⁰⁴ These same mega banks also happen to be some of the largest APs in the ETF ecosystem.¹⁴⁰⁵

Interconnectivity in financial markets can both absorb and amplify shocks, making them at once “robust” and “fragile”.¹⁴⁰⁶ It's increasingly prudent to consider financial markets together as a “system” and design regulatory structures in this light.¹⁴⁰⁷ 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.¹⁴⁰⁸ The FSOC's activity, and entity-based, frameworks, when evaluated individually for ETFs have limitations. As advocated by previous scholars,¹⁴⁰⁹ 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.¹⁴¹⁰

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,”

assets-blow-past-7-trillion-in-milestone-for-investment-giant-11579089828
[<https://perma.cc/PDB4-ZKLP>].

1402. See *supra* Section IV(d).

1403. *Id.*

1404. See Alvarez & McPartland, *supra* note 878, at 11-19;

1405. See BLACKROCK, *A Primer*, *supra* note 1027, at 3 (BlackRock lists the following examples of “Common U.S. APs” as “Bank of America Merrill Lynch, Citigroup, Credit Suisse, Deutsche Bank, Goldman Sachs & Co., Jeffries, JP Morgan, KCG, Morgan Stanley, UBS Securities, Virtu.”)

1406. See Haldane, *supra* note 871, at 3-5.

1407. Haldane, *supra* note 871, at 3-5.

1408. See *infra* Section V.

1409. Kress, McCoy & Schwarcz, *supra* note 874.

1410. See Haldane, *supra* note 901, at 13.

“feedback effects” in periods of heightened stress, unknown risks (the so called “Knightian uncertainties”), and network “dimensionality” due to financial innovation.¹⁴¹¹ 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.”¹⁴¹² 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.¹⁴¹³

1411. Haldane, *supra* note 901, at 2.

1412. Haldane, *supra* note 901, at 2.

1413. See Gilbert, *supra* note 877.

Chapter V: Exchange Traded Confusion: How Industry Practices Undermine Product Comparisons in Exchange Traded Funds

The following chapter is forthcoming to be published in the Fall 2020 edition of the VIRGINIA LAW & BUSINESS REV. as “*Exchange Traded Confusion: How Industry Practices Undermine Product Comparisons in Exchange Traded Funds*” and is available online here: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3680219

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 popularity¹⁴¹⁴ and variety¹⁴¹⁵ - fueled by an array of diverse and compelling demand factors.¹⁴¹⁶ Yet despite their popularity, it is extremely difficult to effectively compare products side by side. Navigating the “shear breadth of products all tracking the same index” can be confusing, if not completely overwhelming.¹⁴¹⁷ One recent report noted twenty four separate ETFs that track the *S&P Net Total Return Index* (\$US).¹⁴¹⁸ ETFs can also be difficult to distinguish from mutual funds, or other passive investments tracking similar

¹⁴¹⁴ See Jill Fisch, Assaf Hamdani, & Steven Davidoff Solomon, *The New Titans of Wall Street: A Theoretical Framework for Passive Investors*, 168 U. PA. L. REV. 17, 17-19, 27-31 (2019) (Describing the importance of ETFs and index funds in modern day capital markets); M. Lettau & A. Madhavan, *Exchange-Traded Funds 101 for Economists*, 32(1) JOURNAL OF ECONOMIC PERSPECTIVES 135, 135-138 (2018) (Describing the importance and operating structure of an ETF as an investment product that provides exposure to an underlying asset pool but, unlike a mutual fund, trades intraday on a stock exchange).

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.

¹⁴¹⁷ See Anna Fedorova, *ETF Index Tracking and How Performance Can Vary*, WHAT INVESTMENT (December 19, 2019), <https://www.whatinvestment.co.uk/etf-index-tracking-and-why-different-etfs-track-the-same-index-2617113/>.

¹⁴¹⁸ *Id.*; see TRACKINSIGHT, *S&P 500 Net Total Return – USD*, <https://www.trackinsight.com/en/index/379> (accessed July 11, 2020).

indices.¹⁴¹⁹ Accessible ETFs now number in the many thousands.¹⁴²⁰ 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.¹⁴²¹

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.¹⁴²² It also shows how product comparisons are obscured by disclosure effectiveness challenges in light of investor cognitive limitations and behavioral tendencies.¹⁴²³

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).¹⁴²⁴ This rule standardized the process to launch for certain ETF structures without having to obtain a costly exemptive order.¹⁴²⁵ While a positive step, more can be done to improve ETF product

¹⁴¹⁹ See Simon Constable, *Spoilt Rotten: Are There Too Many Mutual Funds and ETFs?* FORBES (May 16, 2018), <https://www.forbes.com/sites/simonconstable/2018/05/16/spoilt-for-choice-are-there-too-many-mutual-fund-etf-choices/#1db937c92f37>; See Edwin J. Elton, Martin J. Gruber & Andre de Souza, *Passive Mutual Funds and ETFs: Performance and Comparison*, NYU STERN SCHOOL OF BUSINESS WORKING PAPER (April 29, 2019), at 3-6, available at http://people.stern.nyu.edu/eelton/working_papers/Passive_Mutual_Funds.pdf.

¹⁴²⁰ See ETFGI, *supra* note 1415.

¹⁴²¹ See ETF.COM, *Lists of ETFs*, available at <https://www.etf.com/channels> (last assessed July 11, 2020).

¹⁴²² See *infra* Part I.

¹⁴²³ See *infra* Part II.

¹⁴²⁴ U.S. SEC. & EXCH. COMM’N, *Exchange Traded Funds*, Investment Company Act Release No. 33,646 (September 25, 2019), 84 Fed. Reg. 57,162, 57,166 (Oct. 24, 2019) (to be codified at 17 C.F.R. pts. 210, 232, 239, 270, 274), available at <https://www.sec.gov/rules/final/2019/33-10695.pdf> (hereinafter “Rule 6c-11”).

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

comparisons.¹⁴²⁶ 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.¹⁴²⁷ 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.¹⁴²⁸ 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.¹⁴²⁹ 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.¹⁴³⁰

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”.

net asset value (NAV) by APs, despite concurrent secondary market trading by investors, when NAV can potentially deviate from secondary prices; together with exemptive relief from certain provisions of the *Securities Act of 1933*, 15 U.S.C. §§ 77a--aa (2020), and the *Securities Exchange Act of 1934*, 15 U.S.C. §§ 78a--nn (2020). This exemptive relief was often expensive, time-consuming, and inefficient. See Rule 6c-11, *supra* note 1424 at 34-42; See Comment Letter to SEC of the ETF Committee of the Asset Management Group of the Securities Industry and Financial Markets Association on File No. S7-15-18 (September 28, 2018), at 2, available at <https://www.sec.gov/comments/s7-15-18/s71518-4460525-175804.pdf> (“SIFMA Comment Letter I”); see Comment Letter to SEC of Invesco on File No. S7-15-18 (September 26, 2018), at 7-10, 20-22, available at <https://www.sec.gov/comments/s7-15-18/s71518-4434256-175698.pdf> (“Invesco Comment Letter”).

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.¹⁴³¹ Index investing thus provides “instant, liquid exposure” to worldwide markets and asset classes.¹⁴³² Many popular indices are commercially sponsored like the *Dow Jones Industrial Index* (representing thirty “blue chip” U.S. industrial stocks), the *Russell 2000® 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

¹⁴³¹ See U.S. SEC. & EXCH. COMM’N, *Fast Answers Market Indices*, <https://www.sec.gov/fast-answers/answersindiceshtm.html> (last accessed June 27, 2020) (hereinafter “SEC Indices”).

¹⁴³² See Rachel Evans & Carolina Wilson, *How ETFs Became the Market*, BLOOMBERG (Sept. 13, 2018), <https://www.bloomberg.com/graphics/2018-growing-etf-market/?srnd=etfs>

Market).¹⁴³³ ETF issuers frequently replicate popular indices,¹⁴³⁴ as this mitigates the risk of clients seeking out desired index structures elsewhere.¹⁴³⁵

Unfortunately, there is significant “variety” in the number of indices, and how they are constructed.¹⁴³⁶ 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*¹⁴³⁷ and *Schwab*¹⁴³⁸). On March 31, 2020, these two ETFs had different holdings and portfolio maturity compositions,¹⁴³⁹ supporting recent contentions (discussed in detail below) that indexing is actually “active” investment management.¹⁴⁴⁰ The choice of index replication

¹⁴³³ See SEC Indices, *supra* note 1431.

¹⁴³⁴ Some suggest indices operate “largely unregulated” in the U.S. and create instability because of informational opacity, a potential for market manipulation, and the emergence of conflicts of interests including pressures from foreign governments relating to index composition, see Jenna I. McCarthy, *Benchmarking The World: A Proposal For Regulatory Oversight of Stock Market Index Providers*, 51 VAND. J. TRANSNAT’L L. 1191, 1218-1227 (2018); Robert J. Jackson & Steven Davidoff Solomon, *What’s Really In Your Index Fund?* THE NEW YORK TIMES (February 18, 2019), <https://www.nytimes.com/2019/02/18/opinion/index-fund.html>

¹⁴³⁵ 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>; This phenomenon also confers advantages on large incumbent ETF issuers, see Lucian Bebchuk & Scott Hirst, *The Specter of the Giant Three*, 99 B.U. L. REV. 721, 731 (2019) (“However, the nature of index fund offerings is such that, if investors show interest in an indexed product that is not currently offered by the Big Three, the Big Three can swiftly offer a very similar competing product.”)

¹⁴³⁶ See Fisch, Hamdani, & Solomon, *supra* note 1414 at 21-22 (“Although a passive fund is a fund that is managed to track an index, there are a wide variety of indexes, meaning that there is substantial variation among passive funds. The construction and management of the index is not passive but entails a form of managed investing, if not by the passive funds themselves, then by the index providers.”)

¹⁴³⁷ See BLACKROCK iSHARES CORE U.S. AGGREGATE BOND ETF, <https://www.ishares.com/us/products/239458/ishares-core-total-us-bond-market-etf> (assessed July 15, 2020).

¹⁴³⁸ See SCHWAB U.S. AGGREGATE BOND ETF, <https://www.schwabfunds.com/products/schz> (assessed July 15, 2020).

¹⁴³⁹ 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-ishares-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 impractical 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

¹⁴⁴¹ See *infra* Part I(a)(iii); see Sam Bourgi, *The Hidden Risks and Costs of ETFs*, ETF DATABASE (January 10, 2017), <https://etfdb.com/etf-education/hidden-risks-costs-etfs/>.

¹⁴⁴² See DEUTSCHE BUNDESBANK, *The Growing Importance of Exchange Traded Funds in the Financial Markets, Monthly Report* 79, 83-84 (Oct. 2018) (Ger.), <https://www.bundesbank.de/resource/blob/766600/2fd3ae4f0593fb2ce465c092ce40888b/mL/2018-10-exchange-traded-funds-data.pdf> (explaining the various methods of ETF index replication and distinguishing “physical” replication from “synthetic” methodologies.)

¹⁴⁴³ *Id.*; see Fedorova, *supra* note 1417.

¹⁴⁴⁴ See Fedorova, *supra* note 1417 (“The bottom 50 stocks in the FTSE All-Share make up less than 0.5% of the index, meaning the transaction costs involved in buying these stocks far outweigh the benefits of owning them.”)

¹⁴⁴⁵ See ROCHELLE ANTONIEWICZ & JANE HEINRICKS, INV. CO. INST., *THE ROLE AND ACTIVITIES OF AUTHORIZED PARTICIPANTS OF EXCHANGE TRADED FUNDS 1* (Mar. ed. 2015), https://www.ici.org/pdf/ppr_15_aps_etfs.pdf (“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.”); SEE BLACKROCK, *A PRIMER ON ETF PRIMARY TRADING AND THE ROLE OF AUTHORIZED PARTICIPANTS* 3, 3 ex. (2 Mar. ed. 2017) (hereinafter BLACKROCK, *A PRIMER*) <https://www.blackrock.com/corporate/literature/whitepaper/viewpoint-etf-primary-trading-role-of-authorized-participants-march-2017.pdf> (listing Bank of America Merrill Lynch, Citigroup, Credit Suisse, Deutsche Bank, Goldman Sachs & Co., Jeffries, JP Morgan, KCG, Morgan Stanley, UBS Securities, Virtu as “[e]xamples of [c]ommon US APs”).

¹⁴⁴⁶ See BOCCONIS STUDENTS INVESTMENT CLUB, *Advanced ETF Mechanics and its Flaws* (April 7, 2019), <http://bsic.it/advanced-etf-mechanics-and-its-flaws/>.

¹⁴⁴⁷ See DEUTSCHE BUNDESBANK, *supra* note 1442 at 83-84.

¹⁴⁴⁸ 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-etfs/>; see Fisch, Hamdani, & Solomon, *supra* note 1414 at 21; Robertson, *supra* note 1440.

¹⁴⁴⁹ See DEUTSCHE BUNDESBANK, *supra* note 1442 at 83-84.

¹⁴⁵⁰ See TRACKINSIGHT, *How is Optimized Sampling Conducted?*

<https://www.trackinsight.com/en/education/education-optimised-sampling> (accessed July 15,

“stratified sampling.”)¹⁴⁵¹ These methods potentially introduce tracking error.¹⁴⁵² A synthetically replicated ETF uses derivatives (with cash collateral), where the ETF sponsor enters into a swap transaction.¹⁴⁵³

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.¹⁴⁵⁴ 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.¹⁴⁵⁵ Several instances of significant premiums and discounts in ETFs have been noted in the literature over the last decade.¹⁴⁵⁶ 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”).¹⁴⁵⁷ 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.”¹⁴⁵⁸ APs have a contractual right but not a legal or fiduciary “obligation” to perform this

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 BUNDESBANK *supra* note 1442 at 83-84.

¹⁴⁵⁴ See Marc Gerstein, *Why Your Supposedly Stable Fixed-Income ETF Fell Off A Cliff*, FORBES (March 23, 2020), <https://www.forbes.com/sites/marcgerstein/2020/03/23/why-your-supposedly-stable-fixed-income-etf-fell-off-a-cliff/#7a1c08bf7ba5>.

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.

¹⁴⁵⁷ See ETF.COM, *Understanding Premiums and Discounts*, <https://www.etf.com/etf-education-center/etf-basics/understanding-premiums-and-discounts?nopaging=1> (last accessed June 28, 2020); Ben Johnson, *Navigating ETF Discounts and Premiums During Turbulent Times*, MORNINGSTAR (March 20, 2020), <https://www.morningstar.com/articles/973313/navigating-etf-discounts-and-premiums-during-turbulent-times>.

¹⁴⁵⁸ See Ryan Clements, *New Funds, Familiar Fears: Do Exchange Traded Funds Make Markets Less Stable? Part I, Liquidity Illusions*, 20 HOU. BUS. & TAX L. J. 14, 25-26 (2020).

arbitrage.¹⁴⁵⁹ In a normally functioning market, APs have a market incentive to perform this arbitrage because they can extract risk free profits.¹⁴⁶⁰ This arbitrage function is heavily automated by computer algorithms – a phenomenon recently criticized as exacerbating market volatility.¹⁴⁶¹

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.¹⁴⁶² There are numerous factors that can contribute to APs withdrawing from performing arbitrage including a lack of desire to deal in undesirable securities,¹⁴⁶³ “inventory risk” during periods of market stress,¹⁴⁶⁴ an inability to acquire and “transact in” certain underlying or illiquid assets,¹⁴⁶⁵ and conflicts when acting as dealers in the underlying asset market (especially for less liquid assets like bonds).¹⁴⁶⁶ Price dislocation risk is

¹⁴⁵⁹ See Henry T.C. Hu & John Morley, *A Regulatory Framework For Exchange Traded Funds*, 91 S. CAL. L. REV. 839, 853 (2018) (hereinafter “Hu & Morley 1”); See Henry T.C. Hu & John Morley, *The SEC and Regulation of Exchange-Traded Funds: A Commendable Start and a Welcome Invitation*, 92 S. CAL. L. REV. 1155, 1196 (2019) (hereinafter “Hu & Morley 2”)

¹⁴⁶⁰ See Ayan Bhattachaya & 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.”)

¹⁴⁶¹ See Gerry Frigon, *ETFs are Exacerbating Market Volatility*, FORBES (April 28, 2020), <https://www.forbes.com/sites/forbesfinancecouncil/2020/04/28/etfs-are-exacerbating-market-volatility/#783c7532477e>.

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, *New Funds*, *supra* note 1458 at 30-32.

¹⁴⁶⁴ See U.S. SECURITIES & EXCHANGE COMMISSION SUBCOMMITTEE ON ETFs AND BOND FUNDS, *Report on the Design of Exchange-Traded Funds and Bond Funds—Implications for Fund Investors and Underlying Security Markets under Stressful Conditions. Prepared for the Fixed Income Market Structure Advisory Committee* (2019), at 19, available at <https://www.sec.gov/spotlight/fixed-income-advisory-committee/etfs-and-bond-funds-subcommittee-report-041519.pdf> (hereinafter “SEC Bond Subcommittee”).

¹⁴⁶⁵ See Comment Letter to SEC of Bluefin Trading, LLC on File No. S7-15-18 (October 19, 2018), available at <https://www.sec.gov/comments/s7-15-18/s71518-4544409-176131.htm> (“Bluefin Comment Letter”)

¹⁴⁶⁶ See Kevin Pan & Yao Zeng, *ETF Arbitrage Under Liquidity Mismatch 2*, EUROPEAN SYSTEMIC RISK BOARD WORKING PAPER NO. 59 (2017), <https://EconPapers.repec.org/RePEc:srk:srkwps:201759>.

a significant factor that can affect ETF investor portfolio performance.¹⁴⁶⁷ Rule 6c-11 did not prescribe a minimum number of APs per ETF to perform the arbitrage function,¹⁴⁶⁸ despite expressed concerns about arbitrage and market making instability in stressed markets, and potential “anticompetitive behavior” due to AP concentration.¹⁴⁶⁹ Yet to compare ETFs side by side one must assess the arbitrage robustness of individual ETFs, a task which is very difficult.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.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.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,¹⁴⁷³ and the *BlackRock iShares iBoxx \$ Investment Grade Corporate Bond ETF* which traded at a 5 percent discount to NAV.¹⁴⁷⁴ Even normally “ultra-stable” short-maturity bond ETFs experienced historic single day losses, with Bloomberg

¹⁴⁶⁷ See BOCCONI STUDENT INVESTMENT CLUB, *Investing in the ETF Era*, (March 3, 2019), <https://bsic.it/investing-in-the-etf-era/>.

¹⁴⁶⁸ Rule 6c-11, *supra* note 1424 at 54.

¹⁴⁶⁹ See Comment Letter to SEC of Jane Street Capital, LLC on File No. S7-15-18 (October 19, 2018), at 5-6, available at <https://www.sec.gov/comments/s7-15-18/s71518-4467045-175801.pdf> (“Jane Street Comment Letter”); Bluefin Comment Letter, *supra* note 1465.

¹⁴⁷⁰ See Hu & Morley 1, *supra* note 1459 at 892-900; Clements, *supra* note 1458 at 31-32.

¹⁴⁷¹ See Gillian Tett, *ETFs are the canary in the bond coal mine*, FINANCIAL TIMES (July 29, 2020), <https://www.ft.com/content/6bdc7747-3ab9-4410-a4b2-ba9acbe204e8>; Lewis Braham, *Emerging Market ETF Pricing Another Victim of the Coronavirus Outbreak*, BARRON’S (March 26, 2020), <https://www.barrons.com/articles/emerging-market-etf-pricing-another-victim-of-the-coronavirus-outbreak-51585217700>; Ryan Clements, *What Have We Learned So Far About ETFs In The COVID-19 Crisis?* DUKE FINREG BLOG (April 3, 2020), <https://sites.duke.edu/thefinregblog/2020/04/03/what-have-we-learned-so-far-about-etfs-in-the-covid-19-crisis/>; Andrea Riquier, *ETFs behaving badly: ‘exactly what they are supposed to do’ or ‘just what we feared’?* MARKETWATCH (March 28, 2020), <https://www.marketwatch.com/story/heres-how-to-think-about-the-turbulence-in-etf-pricing-and-heres-what-to-do-about-it-2020-03-27>.

¹⁴⁷² See Sirio Aramonte & Fernando Avalos, *The recent distress in corporate bond markets: cues from ETFs*, BANK FOR INTERNATIONAL SETTLEMENTS BULLETIN NO. 6 (April 14, 2020), 1-4, available at <https://www.bis.org/publ/bisbull06.pdf>.

¹⁴⁷³ See Dawn Lim, *Bond ETFs Flash Warning Signs of Growing Mismatch*, THE WALL STREET JOURNAL (March 23, 2020), <https://www.wsj.com/articles/bond-etfs-flash-warning-signs-of-growing-mismatch-11584964801>;

¹⁴⁷⁴ See Katherine Greifeld, *Fed Lifeline Saves Bond Funds Teetering on Brink of ETF Hell*, BLOOMBERG (March 28, 2020), <https://www.bloomberg.com/news/articles/2020-03-28/fed-lifeline-shields-bond-funds-teetering-on-brink-of-etf-hell>.

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.”¹⁴⁷⁵ 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.”¹⁴⁷⁶ Massive discounts (as high as 15 percent) also surfaced in emerging market ETFs.¹⁴⁷⁷

These massive price dislocations persisted in credit ETFs until the Federal Reserve intervened with its *Secondary Market Corporate Credit Facility* (SMCCF),¹⁴⁷⁸ at which point ETF prices realigned with their underlying NAV.¹⁴⁷⁹ The SMCCF included an unprecedented act of purchasing credit ETFs.¹⁴⁸⁰ 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.¹⁴⁸¹ 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.¹⁴⁸² 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

¹⁴⁷⁵ See Brian Chappatta, *Bond ETFs Will Never Be The Same After Coronavirus*, BLOOMBERG OPINION (March 23, 2020), <https://www.bloomberg.com/opinion/articles/2020-03-23/coronavirus-bond-etfs-will-never-be-the-same-after-this-crisis>.

¹⁴⁷⁶ See Katherine Greifeld & Luke Kawa, *Fed’s Historic Step Into Credit Markets May Cure ETF Dislocations*, BLOOMBERG (March 23, 2020), <https://www.bloomberg.com/news/articles/2020-03-23/fed-credit-backstop-fuels-surge-in-investment-grade-bond-etfs>.

¹⁴⁷⁷ See Lewis Braham, *Emerging Market ETF Pricing Another Victim of the Coronavirus Outbreak*, BARRON’S (March 26, 2020), <https://www.barrons.com/articles/emerging-market-etf-pricing-another-victim-of-the-coronavirus-outbreak-51585217700>

¹⁴⁷⁸ FEDERAL RESERVE, POLICY TOOLS, SECONDARY MARKET CORPORATE CREDIT FACILITY, <https://www.federalreserve.gov/monetarypolicy/smccf.htm> (last visited June 28, 2020).

¹⁴⁷⁹ See Katherine Greifeld, *One Month of Fed ETF Buying Redraws \$4 Trillion Market Contours*, BLOOMBERG (June 16, 2020), <https://www.bloomberg.com/news/articles/2020-06-16/a-month-of-fed-bond-etf-buying-and-what-it-did-to-markets>.

¹⁴⁸⁰ See Andrea Riquier, *The Fed is Going to Buy ETFs. What Does It Mean?* MARKETWATCH (March 30, 2020), <https://www.marketwatch.com/story/the-fed-is-going-to-buy-etfs-what-does-it-mean-2020-03-23>.

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.¹⁴⁸³ Also, with BlackRock at the helm, the Fed purchased hundreds of millions of dollars of BlackRock high-yield (junk-bond) ETFs.¹⁴⁸⁴

In a recent publication, I identified the similarities between ETFs and instabilities in *Auction Rate Securities* (ARS) market in 2008, and *portfolio insurance* in 1987.¹⁴⁸⁵ 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.¹⁴⁸⁶ 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.”¹⁴⁸⁷ 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.¹⁴⁸⁸ 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.¹⁴⁸⁹ 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.¹⁴⁹⁰ 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.¹⁴⁹¹

¹⁴⁸³ See Matthew Boesler, Katherine Greifeld & Catarina Saraiva, *Fed Reveals ETFs It Purchased in Emergency Lending Program*, BLOOMBERG (May 29, 2020), <https://www.bloomberg.com/news/articles/2020-05-29/fed-reveals-which-etfs-it-purchased-in-emergency-lending-program>.

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.

¹⁴⁹⁰ See Greifeld & Luke Kawa *supra* note 1476.

¹⁴⁹¹ See Clements, *supra* note 1458 at 45-49; Floyd Norris, *A Computer Lesson Still Unlearned*, N.Y. Times (Oct. 18, 2012), <https://www.nytimes.com/2012/10/19/business/a-computer-lesson-from-1987-still-unlearned-by-wall-street.html>; Mark Carlson, Fed. Res. Bd., 2007-13, A BRIEF HISTORY OF THE 1987 STOCK MARKET CRASH WITH A DISCUSSION OF THE

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.¹⁴⁹² Performance deviation of an ETF from its index is a "replication risk," also commonly known as "tracking error."¹⁴⁹³ If an ETF consistently incurs tracking errors, then the "set it and forget it" investment ethos that powers passive indexing is largely undermined.¹⁴⁹⁴ 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.¹⁴⁹⁵ Year over year tracking errors have been reported in ETFs benchmarking high yield bonds,¹⁴⁹⁶ and emerging market indices.¹⁴⁹⁷ 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.¹⁴⁹⁸ 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.¹⁴⁹⁹ 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

FEDERAL RESERVE RESPONSE IN FINANCE AND ECON. DISCUSSION SERIES, DIV. OF RES. STAT. & MONETARY AFFAIRS (Nov. 2006), at 11-12.

¹⁴⁹² See Eric Fontinelle, *ETF Tracking Errors: Protect Your Returns*, INVESTOPEDIA,

<https://www.investopedia.com/articles/exchangetradedfunds/09/tracking-error-etf-funds.asp>

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.

¹⁴⁹⁶ See Lisa Abramowicz, *Uncovering a Hidden Junk-Bond ETF Fee*, BLOOMBERG OPINION (August 18, 2017), <https://www.bloomberg.com/opinion/articles/2017-08-18/an-extra-fee-may-be-hiding-in-that-junk-bond-etf-cost>.

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/80917014-0d39-438c-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.”¹⁵⁰⁰

Tracking error must also be viewed “in context” because it can arise due to numerous factors including costs and chosen replication methods,¹⁵⁰¹ and cash management and settlement activities.¹⁵⁰² 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).¹⁵⁰³ 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.¹⁵⁰⁴ This is a particular problem for niche or specialized sector funds where its tracked index may not have similar constraints.¹⁵⁰⁵ Trading and management fees also create tracking error.¹⁵⁰⁶

Further, ETFs that use physical replication have been noted as being more prone to tracking error than those synthetically replicated with derivatives.¹⁵⁰⁷ Large samples (approaching full physical replication) are costly but reduce tracking error.¹⁵⁰⁸ As a result, “sampling” methods are often enhanced synthetically for optimization.¹⁵⁰⁹ 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.¹⁵¹⁰

¹⁵⁰⁰ See Elton, Gruber & de Souza, *supra* note 1419 at 28.

¹⁵⁰¹ Fedorova, *supra* note 1417.

¹⁵⁰² See *infra* Part I(ii)If; 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.”)

¹⁵⁰³ See Fontinelle, *supra* note 1492.

¹⁵⁰⁴ See Exchange Act, *supra* note 1425 at Section 11(d)(1), Rule 4e-5; Dechert Comment Letter, *supra* note 1502 at 10-11.

¹⁵⁰⁵ Fontinelle, *supra* note 1492.

¹⁵⁰⁶ *Id.*

¹⁵⁰⁷ See Bourgi, *supra* note 1441.

¹⁵⁰⁸ See Bocconis, *supra* note 1446.

¹⁵⁰⁹ *Id.*

¹⁵¹⁰ 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.¹⁵¹¹ The modern proliferation of ETFs has also given rise to emerging concerns contesting whether index funds are in-fact “passive.”¹⁵¹² Illuminating research from Professor Adrianna Robertson has revealed that “passive” ETFs aren’t passive at all, but rather what she calls “delegated management.”¹⁵¹³ Robertson shows, that despite the vast majority of ETF’s having a “primary objective” of tracking an index,¹⁵¹⁴ a “substantial fraction” of such ETFs track a bespoke index created by the ETF manager or an affiliate.¹⁵¹⁵ She warns, given this compositional “heterogeneity,” that investors should proceed cautiously when assessing “baselines” or benchmarks as measurement mechanisms.¹⁵¹⁶ 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 often attuned to) but including the costs of affiliate licensing in more opaque expense ratios.¹⁵¹⁷

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

¹⁵¹¹ See ETFDB.COM, *ETF Directory*, <https://etfdb.com/etfs/> (last visited July 11, 2020).

¹⁵¹² See Robertson, *supra* note 1440.

¹⁵¹³ 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 delegee (her agent) to make decisions on her behalf. Instead of being truly passive, tracking an index almost always implies choosing a managed portfolio.”)

¹⁵¹⁴ 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.

¹⁵¹⁵ See *id.* at 833, 836.

¹⁵¹⁶ See *id.* at 797-798, 805-806.

¹⁵¹⁷ 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.

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").¹⁵¹⁸ 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."¹⁵¹⁹ 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.¹⁵²⁰ Kashner notes, "NAV's can be designed to minimize calculated tracking difference or premium / discount" and suggests that choosing one method eliminates an ETF's ability to minimize the other.¹⁵²¹

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."¹⁵²² 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.

¹⁵²⁰ Elisabeth Kashner, *Will the Real ETF Valuation Metric Please Stand Up*, FACTSET (March 21, 2019), <https://insight.factset.com/will-the-real-etf-valuation-metric-please-stand-up>; Elisabeth Kashner, *The Wild West of ETF Performance*, ETF.COM (March 22, 2019), <https://www.etf.com/sections/features-and-news/wild-west-etf-performance?nopaging=> (identifying an "end of day" valuation methodology to "align strike times with capital market closings" and an alternative valuation methodology based on "synchronizing with benchmark valuation").

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 ETF¹⁵²³ and *Invesco PureBeta FTSE Emerging Markets ETF*¹⁵²⁴) which both track the *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.¹⁵²⁵ Kashner suggests the only viable solution is a standardized requirement for both NAV calculation methods.¹⁵²⁶ Unfortunately, the SEC did not mandate a standardized NAV calculation methodology (or address the two prongs noted by Kashner) in Rule 6c-11.¹⁵²⁷ IIV calculation variability was also identified by investment manager *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.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.”¹⁵²⁹

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, *pro rata*, with disclosed ETF portfolio holdings, in the redemption and

¹⁵²³ See *Schwab*, Emerging Markets Equity ETF, <https://www.schwabfunds.com/products/sche> (accessed July 1, 2020).

¹⁵²⁴ See *Invesco*, PureBetaSM FTSE Emerging Markets ETF, <https://www.invesco.com/us/financial-products/etfs/product-detail?productId=ETF-PBEE> (accessed July 1, 2020).

¹⁵²⁵ Kashner, Will the Real, *supra* note 1520 (Kashner 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.)

¹⁵²⁶ *Id.*

¹⁵²⁷ See Rule 6c-11, *supra* note 1424 discussion at 64-66; see *infra* Part III(i).

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)”)

¹⁵²⁹ *Id.*

creation process.¹⁵³⁰ The use of customized baskets is intended to make ETF arbitrage, creations and redemptions more efficient,¹⁵³¹ and alleviate the “day to day frictions” associated with APs procuring an ETF’s constituent holdings (which vary in availability).¹⁵³² It’s also said to facilitate faster redemptions and creations.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.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).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.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.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.¹⁵³⁸

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.”)

¹⁵³¹ See Comment Letter to SEC of Flow Traders on File No. S7-15-18 (October 1, 2018), at 1, available at <https://www.sec.gov/comments/s7-15-18/s71518-4462733-175818.pdf> (“Flow Traders Letter”); SIFMA Comment Letter I, *supra* note 1425 at 6-7; Comment Letter to SEC of Oppenheimer Funds on File No. S7-15-18 (October 1, 2018), at 2, available at <https://www.sec.gov/comments/s7-15-18/s71518-4462743-175820.pdf> (“Oppenheimer Funds Comment Letter”)

¹⁵³² See Izabella Kaminska, *A Little ETF Rule Change That Could Make A Big Difference*, FINANCIAL TIMES (February 6, 2020) <https://ftalphaville.ft.com/2020/02/05/1580899809000/A-little-ETF-rule-change-that-could-make-a-big-difference/>;

¹⁵³³ *Id.*

¹⁵³⁴ *Id.*

¹⁵³⁵ *Id.*; see Rule 6c-11, *supra* note 1424 at 82-83.

¹⁵³⁶ See Kaminska, *A Little ETF Rule*, *supra* note 1532.

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--/>.

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

Shift From Bonds To Cash, BANK OF CANADA STAFF ANALYTICAL NOTE 2019-34 (December 2019), available at <https://www.bankofcanada.ca/2019/12/staff-analytical-note-2019-34/>.

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.

¹⁵⁴⁵ See Comment Letter to SEC of Stuart Cary on File No. S7-15-18 (July 3, 2018), available at <https://www.sec.gov/comments/s7-15-18/s71518-3996593-167212.htm> (“Cary Comment Letter”); Comment Letter to SEC of Dave Nadig, Managing Director of ETF.com on File No. S7-15-18 (August 28, 2018), available at <https://www.sec.gov/comments/s7-15-18/s71518-173138.htm> (“ETF.com Comment Letter”); Comment Letter to SEC of Jack Reagan on File No. S7-15-18 (July 12, 2018) available at <https://www.sec.gov/comments/s7-15-18/s71518-4042310-168701.htm> (“Reagan Comment Letter”); BlackRock Comment Letter, *supra* note 1451 at 13-14; Comment Letter to SEC of CBOE Global Markets on File No. S7-15-18 (October 1, 2018), at 3-4, available at <https://www.sec.gov/comments/s7-15-18/s71518-4467060-175843.pdf> (“CBOE Comment Letter”); Comment Letter to SEC of BNY Mellon on File No. S7-15-18 (July 3, 2018), available at <https://www.sec.gov/comments/s7-15-18/s71518-4445496-175723.pdf> (“BNY Mellon Comment Letter”); Comment Letter to SEC of Fidelity Investments on File No. S7-15-18 (September 28, 2018) at 3, available at <https://www.sec.gov/comments/s7-15-18/s71518-4460527-175805.pdf> (“Fidelity Comment Letter”); Comment Letter to SEC of Charles Schwab Investment Management on File No. S7-15-18 (October 1, 2018) at 6-7, available at <https://www.sec.gov/comments/s7-15-18/s71518->

concerns about the potential to “front run” or “piggy-backing” on portfolio disclosures.¹⁵⁴⁶ Rule 6c-11 does not, however, require ETF issuers to disclose their customized baskets.¹⁵⁴⁷ In addition to citing increased costs, the SEC suggested that customized basket creation and redemption information is available from the *National Securities Clearing Corporation*, the AP, or an ETF itself.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.¹⁵⁴⁹

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).¹⁵⁵⁰ The most common ETF structure in the U.S. is the “open-end fund”¹⁵⁵¹ - the same classification as mutual funds registered under the ICA¹⁵⁵² with additional parameters under the *Securities Act of 1933*¹⁵⁵³ and the *Securities Exchange Act of 1934*.¹⁵⁵⁴ Other ETF structures include Unit Investment Trusts (UIT), Grantor Trusts, Limited Partnerships (LPs), C

4465587-175824.pdf (“CSIM Comment Letter”); Comment Letter to SEC of Virtu Financial on File No. S7-15-18 (October 3, 2018), at 3, available at <https://www.sec.gov/comments/s7-15-18/s71518-4480209-175867.pdf> (“Virtu Comment Letter”) ; See Eaton Vance Comment Letter, *supra* note 1528 at 3-4.

¹⁵⁴⁶ See Rule 6c-11, *supra* note 1424 at 69; Invesco Comment Letter, *supra* note 1425 at 14.

¹⁵⁴⁷ See Rule 6c-11, *supra* note 1424 at 94 (“After considering comments, however, the Commission is not including a basket publication requirement in rule 6c-11.”)

¹⁵⁴⁸ *Id.* at 95.

¹⁵⁴⁹ Kaminska, A Little Rule, *supra* note 1532.

¹⁵⁵⁰ See Aaron Levitt, *The 7 Different ETF Structures*, ETFDB.COM (April 20, 2016), <https://etfdb.com/portfolio-management/the-7-different-etf-structures/>; see *supra* Part I(i)(b) & (c).

¹⁵⁵¹ *Id.*; See Rule 6c-11, *supra* note 1424 at 154 (“ETFs are predominantly structured as open-end funds.”)

¹⁵⁵² See *supra* note 1425.

¹⁵⁵³ *Id.*

¹⁵⁵⁴ *Id.*; 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).¹⁵⁵⁵ Related are exchange traded notes (ETNs), which are unsecured debt instruments that provide a return based on an underlying reference or index.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.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."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.¹⁵⁵⁹

iv. Hidden Fees, Liquidity Rents and "Costs in Context"

ETFs are commonly marketed for their "low cost" value proposition.¹⁵⁶⁰ They are generally "cheaper" than mutual funds,¹⁵⁶¹ with lower administrative costs.¹⁵⁶² Fees in ETFs are extremely competitive across fund companies, and are effectively a very small proportion of assets under management.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.¹⁵⁶⁴ Yet there are also "hidden

¹⁵⁵⁵ See Levitt, *supra* note 1550.

¹⁵⁵⁶ *Id.*; See Akane Otani & Sebastian Pellejero, *Bankrupt in Just Two Weeks' – Individual Investors Get Burned by Collapse of Complex Securities*, THE WALL STREET JOURNAL (June 1, 2020), <https://www.wsj.com/articles/bankrupt-in-just-two-weeks-individual-investors-get-burned-by-collapse-of-complex-securities-11591020059>.

¹⁵⁵⁷ See Hu & Morley 1, *supra* note 1459 at 883.

¹⁵⁵⁸ See Hu & Morley 2, *supra* note 1459 at 1168.

¹⁵⁵⁹ *Id.* at 1168-1169.

¹⁵⁶⁰ See AJ Horch, *Here's Why Investors Started Pouring Trillions into Exchange Traded Funds*, CNBC (May 29, 2020), <https://www.cnbc.com/2020/05/29/why-investors-are-pouring-trillions-into-exchange-traded-funds.html>

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)

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/>.

¹⁵⁶³ See Lucian Bebchuk & Scott Hirst, *Index Funds and the Future of Corporate Governance: Theory, Evidence, and Policy*, 119 COLUM. L. REV. 2054-2055 (2019).

¹⁵⁶⁴ See *id.* at 2055, 2057-2058

costs” in ETFs that investors must understand in order to make effective product comparisons.¹⁵⁶⁵ Some of these may be opaque or unfamiliar like advisory and index licensing fees.¹⁵⁶⁶

In order to compare ETFs side-by-side it’s necessary to look at “costs in context” across similar funds.¹⁵⁶⁷ To do so, an ETF investor must first identify the index replication method an ETF issuer is using for a fund.¹⁵⁶⁸ For example, if an ETF issuer is using an “optimization” or sampling method to lower costs, then the index isn’t fully replicated.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.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.¹⁵⁷¹

ETF price dislocations from NAV (premiums or discounts) highlighted above,¹⁵⁷² also create an overlooked cost for ETF investors.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.”¹⁵⁷⁴ A 2016 *Journal of Portfolio Management* study showed that during periods of ETF price dislocation “deviations from NAV are often much greater than the

¹⁵⁶⁵ See Bocconis, *supra* note 1446.

¹⁵⁶⁶ See Robertson, *supra* note 1440 at 837-841.

¹⁵⁶⁷ See Justin Kuepper, *Three Tips for Reading an ETF Prospectus*, ETFDB.COM (October 20, 2016), <https://etfdb.com/portfolio-management/three-tips-for-reading-an-etf-prospectus/>.

¹⁵⁶⁸ Fedorova, *supra* note 1417.

¹⁵⁶⁹ *Id.*

¹⁵⁷⁰ See Ben Johnson & Christine Benz, *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.)

¹⁵⁷¹ *Id.*; see Kuepper, *supra* note 1567.

¹⁵⁷² See *supra* Part I(a)(ii).

¹⁵⁷³ See Eaton Vance Comment Letter, *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.”)

¹⁵⁷⁴ *Id.* at 9.

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

¹⁵⁷⁵ See J.J. Angel, T.J. Broms & G.L. Gastineau, *ETF Transaction Costs Are Often Higher Than Investors Realize*, 42(3) JOURNAL OF PORTFOLIO MANAGEMENT 55 (2016), available at <https://jpm.pm-research.com/content/42/3/65.full>.

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/voo>, 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).

¹⁵⁷⁸ See Marta Khomyn, Talis J. Putnins & Marius Zoican, *The Value of ETF Liquidity*, EUROPEAN FINANCE ASSOCIATION 2020 HELSINKI (March 26, 2020), available <http://dx.doi.org/10.2139/ssrn.3561531>.

¹⁵⁷⁹ *Id.* at 1.

¹⁵⁸⁰ *Id.* at 2.

¹⁵⁸¹ *Id.* at 1-2.

their fee) from the liquidity externalities of their client.”¹⁵⁸² 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.¹⁵⁸³

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.¹⁵⁸⁴ Securities lending, together with credit default swaps, were two principle factors in the downfall of AIG in the 2008 crisis.¹⁵⁸⁵ The practice has been described as both a “hidden source of return” for ETF sponsors,¹⁵⁸⁶ and the “best-kept secret in the ETF business.”¹⁵⁸⁷ Mutual funds and pensions often lend out the securities they hold,¹⁵⁸⁸ and this has particular appeal for short sellers in search of high demand stocks.¹⁵⁸⁹ ETF investors may potentially benefit from fees generated from securities lending (in the form of reduced costs);¹⁵⁹⁰ however, they are also exposed to new risks – like counterparty default,¹⁵⁹¹ and potentially insufficient or “mismatched” collateral.¹⁵⁹² The amount of profit that passes through to ETF investors is

¹⁵⁸² *Id.* at 2.

¹⁵⁸³ *Id.*

¹⁵⁸⁴ See Tim McLaughlin & Ross Kerber, *Securities Lending Boom Sparks Concerns on Returns and Voting*, REUTERS (November 7, 2018), <https://www.reuters.com/article/us-funds-lending-analysis/securities-lending-boom-sparks-concerns-on-returns-and-voting-idUSKCN1ND0JA>; Jessica Tasman-Jones, *SJP Securities Lending More Than Doubles at Blackrock*, PORTFOLIO ADVISER (August 14, 2019), <https://portfolio-adviser.com/sjp-securities-lending-more-than-doubles-at-blackrock/>.

¹⁵⁸⁵ See Robert McDonald & Anna Paulson, *AIG in Hindsight*, 29(2) J. OF ECON. PERSPECTIVES 81, 81-95 (2015).

¹⁵⁸⁶ See Lewis Braham, *ETFs’ Hidden Source of Return – Securities Lending*, BARRON’S (April 7, 2018), <https://www.barrons.com/articles/etfs-hidden-source-of-returnsecurities-lending-1523054918>.

¹⁵⁸⁷ See Lara Crigger, *Is Securities Lending Good For ETF Investors?* ETF.COM (February 26, 2018), <https://www.etf.com/sections/features-and-news/securities-lending-good-etf-investors?nopaging=1>.

¹⁵⁸⁸ *Id.*

¹⁵⁸⁹ *Id.*

¹⁵⁹⁰ See BLACKROCK, *BlackRock Securities Lending, Unlocking The Potential of Portfolios* (2019), available at <https://www.blackrock.com/us/individual/literature/brochure/us-retail-securities-lending-brochure.pdf>;

¹⁵⁹¹ See Christophe Hurlin, Grégoire Iseli, Christophe Perignon, & Stanley Yeung, *The Counterparty Risk Exposure of ETF Investors*, HEC PARIS RESEARCH PAPER NO. FIN-2014-1050 (March 12, 2019), available at <https://ssrn.com/abstract=2462747>.

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.¹⁵⁹³ Also, not all ETFs structures can use securities lending, for example it is prohibited in ETFs that are organized as UITs.¹⁵⁹⁴

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.¹⁵⁹⁵ 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*,¹⁵⁹⁶ 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*).¹⁵⁹⁷ None of the ETF’s websites, or fact sheets, contains information on securities lending.¹⁵⁹⁸ 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).¹⁵⁹⁹ It is only in the exceedingly dense Statement of Additional Information (SAI), which aggregates

McCullough, *Examining the Risks and Rewards of Securities Lending*, MORNINGSTAR (December 12, 2018), <https://www.morningstar.com/articles/904334/examining-the-risks-and-rewards-of-securities-lending>.

¹⁵⁹³ See Siobhan Riding, *Fund Groups Challenged Over Securities Lending Practices*, FINANCIAL TIMES (May 11, 2019), <https://www.ft.com/content/62946b2e-1a36-3bd9-9515-f48dfa43b2a>.

¹⁵⁹⁴ See Rule 6c-11, *supra* note 1424 at 19; Levitt, *supra* note 1550.

¹⁵⁹⁵ See Clements, *supra* note 1458 at 44-45.

¹⁵⁹⁶ The effort to even isolate a suitable ETF in this category (small capitalization equity) highlights the “paradox of choice” discussed below, *see infra* Part II(c). Industry aggregators ETF.com lists 130 small capitalization equity ETFs that trade in U.S. markets representing over \$210 billion of assets under management, *see* ETF.com, *Small Cap ETF Overview*, <https://www.etf.com/channels/small-cap-etfs> (last accessed July 11, 2020).

¹⁵⁹⁷ See *BlackRock iShares Core S&P Small-Cap ETF*, <https://www.ishares.com/us/products/239774/ishares-core-sp-smallcap-etf>; *Vanguard Small-Cap ETF*, <https://investor.vanguard.com/etf/profile/VB>; *Schwab U.S. Small-Cap ETF*, <https://www.schwabfunds.com/products/scha> (all accessed July 7, 2020).

¹⁵⁹⁸ *Id.*; See *BlackRock IJR Fact Sheet* (March 31, 2020), available from <https://www.ishares.com/us/literature/fact-sheet/ijr-ishares-core-s-p-small-cap-etf-fund-fact-sheet-en-us.pdf>; *Vanguard VB Fact Sheet* (March 31, 2020), available from <https://advisors.vanguard.com/iippdf/pdfs/FS969R.pdf>, *Schwab SCHA Fact Sheet* (March 31, 2020), available from <https://www.schwabfunds.com/products/scha>.

¹⁵⁹⁹ Compare *BlackRock iShares Core S&P Small-Cap ETF 2019 Summary Prospectus* (August 1, 2019 as revised June 25, 2020), *Schwab U.S. Small-Cap ETF Summary Prospectus* (February 25, 2020) and *Vanguard Small-Cap ETF Summary Prospectus* (April 28, 2020).

data for numerous sponsored funds concurrently, where financial details for securities lending is provided for these specific ETFs.¹⁶⁰⁰

vi. Variable Cash Management, Liquidity Operations and Failures to Deliver

Another challenge in comparing ETFs is the significant variation in cash management, dividend reinvestment and timing practices amongst ETF sponsors.¹⁶⁰¹ This includes reinvestment turn-around time when an ETF accepts cash in a customized AP basket exchange.¹⁶⁰² Also, open-ended ETFs registered as investment companies can reinvest dividends and interest; however, ETFs organized as UITs (like *State Street Global Advisors SPDR S&P 500 ETF Trust*¹⁶⁰³) cannot reinvest but must payout cash dividends, and this can “create a cash drag during rising markets.”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.¹⁶⁰⁵ ETFs allowing for cash redemptions may also find a drag on performance, due to larger cash positions.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.¹⁶⁰⁷ Liquidity is “often misunderstood” with ETFs, and

¹⁶⁰⁰ Compare *BlackRock iShares® Trust Statement of Additional Information* (August 1, 2019 as revised June 25, 2020), *Vanguard Index Funds Statement of Additional Information* (April 28, 2020), *Schwab® Equity ETFs, Statement of Additional Information* (December 18, 2019).

¹⁶⁰¹ See Bourgi, *supra* note 1441.

¹⁶⁰² See Arora et al., *supra* note 1538.

¹⁶⁰³ See BLOOMBERG, SPY:US, *SPDR S&P 500 ETF Trust*, <https://www.bloomberg.com/quote/SPY:US> (accessed July 1, 2020) (“This ETF is structured as a Unit Investment Trust and pays dividends on a quarterly basis.”); See Greg McFarlane, *S&P 500 ETFs: What Every Investor Should Know*, INVESTOPEDIA (March 7, 2020), <https://www.investopedia.com/articles/investing/090414/sp-500-etfs-what-every-investor-should-know.asp>

¹⁶⁰⁴ Levitt, *supra* note 1550; See James Chen, *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.”)

¹⁶⁰⁵ See Levitt, *supra* note 1550; Rule 6c-11, *supra* note 11 at 19.

¹⁶⁰⁶ See Rule 6c-11, *supra* note 1424 at 83.

¹⁶⁰⁷ See Bebchuk & Hirst, *The Specter*, *supra* note 1435 at 729.

opaque concepts like “implied liquidity”¹⁶⁰⁸ are more reflective of the actual liquidity of an ETF than commonly cited metrics like “average daily volume.”¹⁶⁰⁹ Professors Lucian Bebchuk 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.”¹⁶¹⁰ The authors suggest that such a phenomenon confers both a “first-mover” and a “network” benefit on large incumbent ETF issuers.¹⁶¹¹ 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.¹⁶¹² FTD has been documented as occurring in ETFs when an AP engages in an “operational shorting” strategy,¹⁶¹³ and also contributing to increased market volatility.¹⁶¹⁴ The possibility of FTD can lead to increased costs for investors who buy and hold ETFs.¹⁶¹⁵

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.”)

¹⁶¹⁴ Thomas Stratmann & John W. Welborn, *Exchange-Traded Funds, Fails To Deliver, and Market Volatility*, GEORGE MASON UNIVERSITY DEPARTMENT OF ECONOMICS, WORKING PAPER NO. 12-59 (2012), available at <http://ssrn.com/abstract=2183251>.

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.”)

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.

¹⁶¹⁷ See FIDELITY, *Exchange Traded Notes*, <https://www.fidelity.com/learning-center/investment-products/etf/types-etfs-etns>.

¹⁶¹⁸ See Dawn Lim, *Investment Giants Want Exchange To Enforce Labeling System For ETFs*, THE WALL STREET JOURNAL (May 13, 2020), <https://www.wsj.com/articles/investment-giants-want-exchanges-to-enforce-labeling-system-for-etfs-11589400300>.

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.*

ETF,¹⁶²³ and the *BlackRock iShares MSCI Israel ETF*¹⁶²⁴), on the date of inquiry had different portfolio weights for top holdings, and varied sector exposures.¹⁶²⁵ Relatedly, some stocks can be characterized, concomitantly, as dividend, growth, and value.¹⁶²⁶ 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.”¹⁶²⁷ 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.¹⁶²⁸

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.”¹⁶²⁹ Another industry report noted that BlackRock’s *iShares Emerging Markets Minimum Volatility* ETF¹⁶³⁰ has had at times a lower “beta”¹⁶³¹ than the actual S&P 500, and that this defies logic.¹⁶³² The problem of “composition risk”

¹⁶²³ See *VanEck Vectors Israel ETF*, <https://www.vaneck.com/etf/equity/isra/overview/> (accessed July 8, 2020).

¹⁶²⁴ See *BlackRock iShares MSCI Israel ETF*, <https://www.ishares.com/us/products/239663/ishares-msci-israel-capped-etf> (accessed July 8, 2020).

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.

¹⁶²⁹ See George Athanassakos, *Why investors aren’t getting true value stocks with value ETFs*, THE GLOBE AND MAIL (October 2, 2019), <https://www.theglobeandmail.com/investing/markets/etfs/article-why-investors-arent-getting-true-value-stocks-with-value-etfs/>.

¹⁶³⁰ See *BlackRock iShares Edge MSCI Min Vol Emerging Markets* ETF, <https://www.ishares.com/us/products/239641/ishares-msci-emerging-markets-minimum-volatility-etf> (accessed July 7, 2020).

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.

¹⁶³⁴ See Andrea Riquier, *Are ETFs safe....for retail investors?* MARKETWATCH (May 7, 2020), <https://www.marketwatch.com/story/are-etfs-safe-for-retail-investors-2020-05-07>.

¹⁶³⁵ See USCF, *United States Oil Fund (USO)*, <https://www.uscfinvestments.com/uso> (accessed July 8, 2020).

¹⁶³⁶ Riquier, *supra* note 1634.

¹⁶³⁷ See James D. Cox & John W. Payne, *Mutual Fund Expense Disclosures: A Behavioral Perspective*, 93 WASH. U. L. Q. 907, 910 (2005); Edwin J. Elton, Martin J. Gruber & Jeffrey A. Busse, *Are Investors Rational? Choices Among Index Funds*, 59 J. FIN. 261, 285-286 (2004) (revealing that certain poorly performing index mutual funds with also have high distribution costs).

¹⁶³⁸ See Janet Levaus & Ginger Szala, *Why SEC Fined Wells Fargo \$35M Over Inverse ETFs*, THINKADVISOR (March 30, 2020), <https://www.thinkadvisor.com/2020/03/30/sec-fines-wells-fargo-35m-over-inverse-etf-recommendations/>.

¹⁶³⁹ *Id.*

¹⁶⁴⁰ See Bernice Napach, *SRI, ESG or Sustainable Investing? Confusion Over Names Limits Growth, Report Says*, THINKADVISOR (November 8, 2019), <https://www.thinkadvisor.com/2019/11/08/sri-esg-or-sustainable-investing-confusion-over-names-limits-growth-report-says/>.

“socially responsible,” among others.¹⁶⁴¹ In July 2020, industry aggregator ETF.com listed 109 ETFs trading in the U.S. which included a “socially responsible” mandate.¹⁶⁴² An October 2019 report from the *Institute for International Finance* suggests that the “sheer proliferation” of such terms is causing investor confusion.¹⁶⁴³ 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.¹⁶⁴⁴

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.¹⁶⁴⁵ This recommendation aligns with prior reports suggesting “a lack of information or understanding” prevents sustainable investments.¹⁶⁴⁶

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

The ability to “comparison-shop” is particularly challenging in the emerging ETF “model portfolio” industry.¹⁶⁴⁷ These “prepackaged investment

¹⁶⁴¹ *Id.*

¹⁶⁴² See ETF.COM, *Socially Responsible ETF Overview*, <https://www.etf.com/channels/socially-responsible-etfs> (accessed July 7, 2020).

¹⁶⁴³ INSTITUTE OF INTERNATIONAL FINANCE, *The Case For Simplifying Sustainable Investment Terminology*, IIF SUSTAINABLE FINANCE WORKING GROUP REPORT (October 2019), 1, available at <https://www.iif.com/Portals/0/Files/content/Regulatory/IIF%20SFWG%20-%20Growing%20Sustainable%20Finance.pdf>.

¹⁶⁴⁴ *Id.* at 1-2.

¹⁶⁴⁵ See SCHRODERS INVESTMENT MANAGEMENT LIMITED, News Release, *Schroders Global Investor Study 2019: People’s sustainable investment ambitions fail to reflect their actions*, (September 17, 2019), https://www.schroders.com/en/media-relations/newsroom/all_news_releases/schroders-global-investor-study-2019-peoples-sustainable-investment-ambitions-fail-to-reflect-their-actions/.

¹⁶⁴⁶ See SCHRODERS INVESTMENT MANAGEMENT LIMITED, News Release, *Schroders Global Investor Study 2018: Minority of people globally concerned investing sustainably would hinder returns* (September 16, 2018), https://www.schroders.com/en/media-relations/newsroom/all_news_releases/schroders-global-investor-study-2018--minority-of-people-globally-concerned-investing-sustainably-would-hinder-returns/.

¹⁶⁴⁷ Asjylyn Loder, *How’s Your ETF Portfolio Doing? Good Luck Finding Out*, THE WALL STREET JOURNAL (April 7, 2019), <https://www.wsj.com/articles/how-s-your-etf-portfolio-doing-good-luck-finding-out-11554689640>.

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.¹⁶⁴⁸ The universe of available ETF products has grown so vast that many investors prefer to “outsource” portfolio composition decisions.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.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.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.”¹⁶⁵² The tools to perform such a comparison may be available, but generally exist behind expensive paywalls like *Morningstar* and because of costs are largely inaccessible to many investors.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).¹⁶⁵⁴ Smart beta ETFs are often devised around “rules” such as “momentum” or “volatility” or factors (such as value, growth or dividend).¹⁶⁵⁵ This distinguishes smart-beta ETFs from conventional structures that are weighted by market

¹⁶⁴⁸ *Id.*

¹⁶⁴⁹ *Id.*

¹⁶⁵⁰ See Leo Almazora, *Why There’s No Telling Who’s Winning in ETF Portfolios*, WEALTH PROFESSIONAL (April 11, 2019), <https://www.wealthprofessional.ca/investments/etfs/why-theres-no-telling-whos-winning-in-etf-portfolios/256384>.

¹⁶⁵¹ See Loder, *supra* note 1647.

¹⁶⁵² *Id.*

¹⁶⁵³ *Id.*

¹⁶⁵⁴ Nicolas Rabener, *Smart Beta: Broken By Design?* CFA INSTITUTE (February 11, 2019), <https://blogs.cfainstitute.org/investor/2019/02/11/smart-beta-broken-by-design/>.

¹⁶⁵⁵ Ryan Vlastelica, *Smart Beta ETFs may not be the smartest bet over the long-term*, MARKETWATCH (January 1, 2017), <https://www.marketwatch.com/story/smart-beta-etfs-may-not-be-the-smartest-bet-over-the-long-term-2017-01-12>.

capitalization.¹⁶⁵⁶ Many smart-beta ETFs use a combination of factors, described as a “mixture” of both active and passive management.¹⁶⁵⁷ In addition to leveraging academic research which suggests factoring is associated with higher returns,¹⁶⁵⁸ smart-beta funds look to mitigate the high fees and general opacity associated with active funds and the tracking errors in passive structures.¹⁶⁵⁹

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.¹⁶⁶⁰ They have also exhibited significant secondary market price premiums and discounts to NAV.¹⁶⁶¹ One analyst calls this emerging ETF sector part of a finance “reality distortion field” that is more about marketing than actual performance.¹⁶⁶² 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.¹⁶⁶³ 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.¹⁶⁶⁴ 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.¹⁶⁶⁵ Momentum strategies attract little investor capital despite empirical support for higher returns.¹⁶⁶⁶ 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.¹⁶⁶⁷

¹⁶⁵⁶ BROADRIDGE, *Smart Beta Benchmarking: A Statistical Perspective* (2017), at 2, https://www.broadridge.com/_assets/pdf/broadridge-smart-beta-benchmarking-a-statistical-perspective.pdf.

¹⁶⁵⁷ *Id.*

¹⁶⁵⁸ See E.F. Fama & K.R. French, *Common risk factors in the returns on stocks and bonds*, 33 J OF FIN. ECON. 3 (1993).

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,¹⁶⁶⁸ present comparative challenges for investors when choosing between investment managers.¹⁶⁶⁹ Supporters of actively managed ETFs posit that they will improve market efficiency.¹⁶⁷⁰ In May 2019, the SEC provided exemptive relief, for the first time, for a “non-transparent” actively managed ETF.¹⁶⁷¹ 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.¹⁶⁷² The justification for weighting opacity is that it facilitates competition and decreases the ability for firms to duplicate indexing strategies.¹⁶⁷³ Yet there are standing concerns about how non-transparent ETFs will affect markets, and doubts on the real benefits of “opaqueness.”¹⁶⁷⁴ 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.¹⁶⁷⁵

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

¹⁶⁶⁸ See John Coumarianos, *Stage Set For Broader Array of ETFs, Especially Active Ones*, BARRON’S (December 20, 2019), <https://www.barrons.com/articles/stage-is-set-for-a-broader-array-of-etfs-especially-active-ones-51576877127>; Lizzy Gurdus, *‘This could be the year’ for active management, says NYSE head of exchange traded products*, CNBC (May 30, 2020), <https://www.cnbc.com/2020/05/30/nyse-etf-chief-talks-state-of-industry-as-assets-under-management-rise.html>.

¹⁶⁶⁹ See Karen Hube, *It’s a Weird Market. Time To Go Active*, BARRON’S (May 22, 2020), <https://www.barrons.com/articles/active-stock-picking-strategies-gain-appeal-as-markets-fluctuate-51590192074>.

¹⁶⁷⁰ See Bailey McCann, *What To Know About ‘Nontransparent’ ETFs*, THE WALL STREET JOURNAL (May 5, 2019), <https://www.wsj.com/articles/what-to-know-about-nontransparent-etfs-11557108061>.

¹⁶⁷¹ See Precidian ETFs Trust, Investment Company Act Release No. 33477, 2019 WL 2176712 (May 20, 2019); Precidian ETFs Trust, Notice of Application, Investment Company Act Release No. 33440, 2019 WL 1529571 (April 8, 2019).

¹⁶⁷² See U.S. SECURITIES & EXCHANGE COMMISSION, *Public Statement, Statement of Commissioners Jackson and Lee on Non-Transparent Exchange Traded Funds* (November 15, 2019), <https://www.sec.gov/news/public-statement/statement-jackson-lee-2019-11-15> (hereinafter “Jackson Lee Statement”).

¹⁶⁷³ See Andrea Riquier, *What is a ‘non-transparent’ ETF, and why would anyone want to own one?* MARKETWATCH (December 11, 2019), <https://www.marketwatch.com/story/get-ready-for-a-new-flavor-of-etf-non-transparent-2019-11-15>.

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,¹⁶⁷⁶ 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.¹⁶⁷⁷ Studies of this nature look to test “judgmental processes” when investors assess information and make decisions.¹⁶⁷⁸ Mandated securities disclosure serves many worthy public policy goals.¹⁶⁷⁹ Yet the usefulness to investors of mandated

¹⁶⁷⁶ See J.F. Muth, *Rational Expectations and the Theory of Price Movements*, 29(3) *ECONOMETRICA* 315 (1961); Eugene Fama, *Efficient Capital Markets a Review of Theory and Empirical Work*, 25(2) *J. FIN.* 383 (1970); Eugene F. Fama, *Two Pillars of Asset Pricing*, Nobel Prize Lecture (December 8th, 2013), available at,

https://www.nobelprize.org/nobel_prizes/economic-sciences/laureates/2013/fama-lecture.pdf;

¹⁶⁷⁷ See H.A. Simon, *Rational Choice and the Structure of the Environment*, 63(2) *PSYCH.REV.* 129 (1956); Paul Slovic, *Psychology Study Of Human Judgment: Implications For Investment Decision Making*, 27 *J. FIN.* 779 (1972); Barbara Black, *Behavioral Economics and Investor Protection: Reasonable Investors, Efficient Markets*, 44 *LOY. U. CHI. L. J.* 1493(2013); Ronald J. Gilson & Reinier Kraakman, *The Mechanisms of Market Efficiency Twenty Years Later: The Hindsight Bias*, 28 *J. CORP. L.* 715, 723 (2003); Terrance Odean, *Are Investors Reluctant to Realize Their Losses?*, 53 *J. FIN.* 1775, 1781-95 (1998); Terrance Odean, *Do Investors Trade Too Much?*, 89 *AM. ECON. REV.* 1279, 1280-92 (1999); Kent Daniel, David Hirshleifer & Avanidhar Subrahmanyam, *Investor Psychology and Security Under- and Overreactions*, 53 *J. FIN.* 1839, 1844-45 (1998); David Hirshleifer, *Investor Psychology and Asset Pricing*, 56 *J. FIN.* 1533, 1545-46 (2001); David Laibson, *Golden Eggs and Hyperbolic Discounting*, 112 *Q. J. ECON.* 443 (1997); Ann Morales Olazabal, *Behavioral Science and Scierter in Class Action Securities Fraud Litigation*, 44 *LOY. U. CHI. L. J.* 1423 (2013); Richard A. Posner, *Behavioral Finance Before Kahneman*, 44 *LOY. U. CHI. L.J.* 1341, 1341-1342 (2013); RICHARD THALER, *MISBEHAVING: THE MAKING OF BEHAVIORAL ECONOMICS*, 20-21 (2016); Christine Jolls et al., *A Behavioral Approach to Law and Economics*, 50 *STAN. L. REV.* 1471 (1998); Richard A. Posner, *Rational Choice, Behavioral Economics, and the Law*, 50 *STAN. L. REV.* 1551 (1998); Robert J Shiller, *From Efficient Markets Theory to Behavioral Finance*, 17(1) *J. ECON. PERSP.* 83 (2003); Stephen J. Choi & A.C. Pritchard, *Behavioral Economics and the SEC*, 56 *STAN. L. REV.* 1 (2003); David Hirshleifer, *Behavior Finance*, 7 *ANN. REV. OF FIN. ECON.* 133 (2015).

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

dealing, and deterring fraud. See Michael D. Guttentag, *Evolutionary Analysis in Law: On Disclosure Regulation*, 48 ARIZ. ST. L.J. 963, 974 (2016); Michael D. Guttentag, *An Argument for Imposing Disclosure Requirements on Public Companies*, 32 FLA. ST. U. L. REV. 123 (2004); Paul G. Mahoney, *Mandatory Disclosure as a Solution to Agency Problems*, 62 U. CHI. L. REV. 1047, 1054-68 (1995); Michael D. Guttentag, *Accuracy Enhancement, Agency Costs, and Disclosure Regulation*, 3 REV. L. & ECON. 611, 611-41 (2007); See Troy A. Paredes, *Blinded by the Light: Information Overload and Its Consequences for Securities Regulation*, 81 WASH. U. L.Q. 417, 421 (2003).

¹⁶⁸⁰ See Guttentag, *Evolutionary Analysis*, *supra* note 1679 at 974.

¹⁶⁸¹ See Herbert A. Simon, *A Behavioral Model of Rational Choice*, 69 Q. J. ECON. 99, 99–100 (1955)

¹⁶⁸² See Amos Tversky and Daniel Kahneman, *Judgement under Uncertainty: Heuristics and Biases*, 185 SCIENCE 1124 (1974); Daniel Kahneman and Amos Tversky, *Prospect Theory: An Analysis of Decision under Risk*, 47 ECONOMETRICA 507 (1979); Hillary A. Sale, *Judging Heuristics*, 35 U.C. DAVIS L. REV. 903, 905 (2002).

¹⁶⁸³ See THE BOARD OF THE INTERNATIONAL ORGANIZATION OF SECURITIES COMMISSIONS, *The Application of Behavioral Insights to Retail Investor Protection, Final Report* (April 2019), 11-12 (hereinafter “IOSCO Report”);

ONTARIO SECURITIES COMMISSION, *Behavioral Insights Key Concepts, Applications and Regulatory Considerations*, OSC STAFF NOTICE 11-778 (March 29, 2017),

https://www.osc.gov.on.ca/documents/en/Securities-Category1/sn_20170329_11-778_behavioural-insights.pdf (hereinafter “Ontario Securities Commission, Behavioral Insights”); ONTARIO SECURITIES COMMISSION, *Improving Fee Disclosure Through Behavioural Insights*, OSC STAFF NOTICE 11-787 (August 19, 2019), https://www.osc.gov.on.ca/documents/en/Securities-Category1/sn_20190819_11-787_improving-fee-disclosure-through-behavioural-insights.pdf (hereinafter “Ontario Securities Commission, Improving Fee Disclosure.”)

¹⁶⁸⁴ See George Loewenstein, Cass R. Sunstein & Russell Golman, *Disclosure: Psychology Changes Everything*, 6 ANNU. REV. ECON. 391, 394 (2014).

¹⁶⁸⁵ See DAN ARIELY, *PREDICTABLY IRRATIONAL: THE HIDDEN FORCES THAT SHAPE OUR DECISIONS* (originally published in 2008, revised edition 2009).

have even been documented in the context of experts in their own domain.¹⁶⁸⁶ Further, even the most sophisticated institutional investors (which often hold ETFs in their portfolios¹⁶⁸⁷) are prone to investor biases.¹⁶⁸⁸ 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.¹⁶⁸⁹

Compounding the challenge of navigating complex investment disclosures is the fact that retail investors often lack financial literacy – an observation confirmed by the SEC.¹⁶⁹⁰ 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.¹⁶⁹¹ 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.¹⁶⁹² She notes financial illiteracy makes investors “ill-equipped” to avoid “inappropriate” investments, and this leads to market inefficiency.¹⁶⁹³ 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.¹⁶⁹⁴ Fairfax contends

¹⁶⁸⁶ See Hal R. Arkes, *Costs and Benefits of Judgment Errors: Implications for Debiasing*, 110 PSYCHOL. BULL. 486 (1991).

¹⁶⁸⁷ See Christine Williamson, *Hedge funds are using ETFs despite stigma*, INVESTMENT NEWS (April 26, 2012), <https://www.investmentnews.com/hedge-funds-are-using-etfs-despite-stigma-43012>; BROADRIDGE ASSET MANAGEMENT, *Institutional Usage of North America ETFs* (November 2018), available at https://www.broadridge.com/_assets/pdf/broadridge-institutional-usage-of-north-america-etfs.pdf.

¹⁶⁸⁸ Choi & Pritchard, *supra* note 1677 at 17-20.

¹⁶⁸⁹ Elisabeth de Fontenay, *The Myth of the Ideal Investor*, 41 SEATTLE U. L. REV. 425 (2018).

¹⁶⁹⁰ U.S. SEC. & EXCH. COMM’N, STUDY REGARDING FINANCIAL LITERACY AMONG INVESTORS, at vii-viii (2012), available at <http://www.sec.gov/news/studies/2012/917-fmancialliteracy-study-part1.pdf>;

¹⁶⁹¹ See Paul Bourque, *Leveraging Behavioral Economic Research to Enhance Disclosure*, INVESTMENT FUNDS INSTITUTE OF CANADA (November 15, 2018), <https://www.ific.ca/en/articles/leveraging-behavioural-economics-research-to-enhance-disclosure-november-15-2018/>.

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.

¹⁶⁹⁴ See Rule 6c-11, *supra* note 1424 at 26; see Lara Crigger, *Don’t Buy & Hold Leveraged ETFs*, ETF.COM (March 18, 2020), <https://www.etf.com/sections/features-and-news/dont-buy-and-hold-leveraged-etfs?nopaging=1>.

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.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.¹⁶⁹⁶ A body of scholarship suggests otherwise.¹⁶⁹⁷ It is not certain that all publicly disclosed information is incorporated into the price of securities upon dissemination.¹⁶⁹⁸ There are numerous reports of markets failing to exploit arbitrage opportunities or respond to new information.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.”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,¹⁷⁰¹ a discounted view of the future, and emotional states.¹⁷⁰² In order to make rational choices investors must fully understand their preferences,

¹⁶⁹⁵ See Fairfax, *supra* note 1692 at 1098-1100.

¹⁶⁹⁶ See Gilson & Kraakman, *supra* note 1677 at 549-52 & nn.1-5; Black, *supra* note 1677 at 1499.

¹⁶⁹⁷ See Elton, Gruber & Busse, *supra* note 1637 at 286; HERBERT SIMON, *MODELS OF BOUNDED RATIONALITY* (1982); Richard Thaler, *Toward a Positive Theory of Consumer Choice*, 1 J. ECON. BEHAVIOR AND ORGANIZATION 39 (1980); Robert Shiller, *Do Stock Prices Move Too Much to Be Justified by Subsequent Changes in Dividends*, 71(3) AM. ECON. REV. 421 (1981); RICHARD THALER AND CASS SUNSTEIN, *NUDGE: IMPROVING DECISIONS ABOUT HEALTH, WEALTH AND HAPPINESS* (2008); Donald C. Langevoort, *Taming the Animal Spirits of the Stock Markets: A Behavioral Approach to Securities Regulation*, 97 NW. U. L. REV. 135 (2002); DANIEL KAHNEMAN, *THINKING FAST AND SLOW* (2011).

¹⁶⁹⁸ See Frederick C. Dunbar & Dana Heller, *Fraud on the Market Meets Behavioral Finance*, 31 DEL. J. CORP. L. 455, 509-10 (2006); Donald C. Langevoort, *Basic at Twenty: Rethinking Fraud on the Market*, 2009 Wis. L. Rev. 151, 173-74.

¹⁶⁹⁹ Dunbar & Heller, *supra* note 1698 at 478-79, 509-510; Gur Huberman & Tomer Regev, *Contagious Speculation and a Cure for Cancer: A Nonevent that Made Stock Prices Soar*, 56(1) J. FIN. 387 (2001); Posner, *Behavioral Finance*, *supra* note 1677 at 1343.

¹⁷⁰⁰ Steven M. Davidoff & Claire A. Hill, *Limits of Disclosure*, 36 SEATTLE U. L. REV. 599, 628 (2018); see Rule 6c-11 *supra* note 11 at 175.

¹⁷⁰¹ S.T. Allison & D.M. Messick, *The Group Attribution Error*, 21(6) JOURNAL OF EXPERIMENTAL SOCIAL PSYCHOLOGY, 563-579 (1985).

¹⁷⁰² See Ariely, *supra* note 1685 at 317; Ontario Securities Commission, *Behavioral Insights*, *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.

¹⁷⁰⁴ The phenomenon of investor herding traces its origins to advancements in game theory and decision making under conditions of incomplete information, uncertain economic outcomes, and unknown individual payoffs resulting from actions undertaken by external actors. See G.M. Angeletos & I. Werning, *Crises and Prices: Information Aggregation, Multiplicity, and Volatility*, 96(5) AM. ECON. REV. 1720, 1720–36 (2006); S. Morris & H.S. Shin, *Unique Equilibrium in a Model of Self-Fulfilling Currency Attacks*, 88(3) AM. ECON. REV. 587, 587–97 (1998).

¹⁷⁰⁵ Bhattachaya & O’Hara, *supra* note 1460 at 6.

¹⁷⁰⁶ See Jim Allen, *Are ETFs Driving Market Volatility*, BARRON’S (May 7, 2020), <https://www.barrons.com/articles/are-etfs-driving-market-volatility-underlying-assets-caronavirus-51588875101>.

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.

¹⁷¹⁰ See BARRY SCHWARTZ, *THE PARADOX OF CHOICE, WHY MORE IS LESS* (2005).

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,¹⁷¹² as has the “limited attention” of consumers in general.¹⁷¹³ Research has also shown that lengthy disclosures can be ineffective.¹⁷¹⁴ 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.¹⁷¹⁵

Numerous psychological studies suggest that more information does not always lead to better judgment.¹⁷¹⁶ In fact, too much information can impair judgment.¹⁷¹⁷ It can also have negative “affective impacts.”¹⁷¹⁸ More information can irrationally increase a decision maker’s confidence (even if it’s not justified by more accurate decisions).¹⁷¹⁹ Lengthy disclosures also lead to

costs are borne in large part by investors. Whether investors benefit by more information depends on whether the marginal benefits of increments to knowledge exceed the marginal costs.”); See George J. Stigler, *The Economics of Information*, 69 J. POL. ECON. 213, 215 (1961) (discussing how more information can decrease the efficiency of price discovery).

¹⁷¹² See Paredes, *supra* note 1679 at 421; Geoffrey A. Manne, *The Hydraulic Theory of Disclosure Regulation and Other Costs of Disclosure*, 58 ALA. L. REV. 473, 475-476 (2007).

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

¹⁷¹⁴ See OMRI BEN-SHAHAR & CARL E. SCHYNEIDER, *MORE THAN YOU WANTED TO KNOW: THE FAILURE OF MANDATORY DISCLOSURE* (2014), Chapter 1.

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-etfs> (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.

¹⁷¹⁶ See S. Oskamp, *Overconfidence in Case-Study Judgments*, 29 JOURNAL OF CONSULTING PSYCHOLOGY 261 (1965); L. R. Goldberg, *Simple Models or Simple Processes? Some Research on Clinical Judgments*, 23 AMERICAN PSYCHOLOGIST 483 (1968).

¹⁷¹⁷ See S.S. Iyengar & M.R. Lepper, *When choice is demotivating: Can one desire too much of a good thing?* 79(6) JOURNAL OF PERSONALITY AND SOCIAL PSYCHOLOGY 995 (2000)

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.”¹⁷²⁰ This is compounded by the difficulty in undertaking complex assessments which require analysis of numerous variables concomitantly.¹⁷²¹ There is also evidence of investor “aversion” to disclosure that can make them uncomfortable (like conflict of interest disclosures).¹⁷²²

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.¹⁷²³ 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.”¹⁷²⁴ 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.”¹⁷²⁵ This iatrogenic backfire effect has significant relevance to ETF disclosure reforms in Rule 6c-11 below.¹⁷²⁶

Relatedly, a “paradox of choice”¹⁷²⁷ has emerged in ETFs. In 2017 Bloomberg reported that the number of indexes had eclipsed the number of publicly traded stocks.¹⁷²⁸ Recent estimates from consulting firm *ETFGI Global*, notes that from 2008 to 2019 the number of available ETF products

¹⁷²⁰ See Ontario Securities Commission, Behavioral Insights, *supra* note 1683 at 24.

¹⁷²¹ See Simon, *supra* note 1677 at 99–100.

¹⁷²² See Ontario Securities Commission, Behavioral Insights, *supra* note 1683 at 26.

¹⁷²³ Fairfax, *supra* note 1692 at 1088.

¹⁷²⁴ See Money Market Fund Reform, Amendments to Form PF, 79 Fed. Reg. 47,736, 47,828 (Aug. 14, 2014) (codified at scattered parts of 7 C.F.R.).

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, 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.

¹⁷²⁸ See *There Are Now More Indexes Than Stocks*, BLOOMBERG NEWS (May 12, 2017, 4:00 AM), <https://www.bloomberg.com/news/articles/2017-05-12/there-are-now-more-indexes-than-stocks>.

increased from 1617 to 6940 globally.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.¹⁷³⁰ Unfortunately, having “more choices” is not unequivocally a good thing.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” regret¹⁷³²), and “decision avoidance,”¹⁷³³ leading to not investing at all (and risking wealth erosions from inflation).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 ETFs¹⁷³⁵) without fully realizing it.¹⁷³⁶ Too many choices can also lead to investors relying on a “default option”¹⁷³⁷ which could potentially favor large and well known ETF incumbents.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.¹⁷³⁹ The windfall default to established firms because of choice aversion is supported by the “quality

¹⁷²⁹ 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>

¹⁷³⁰ See Rule 6c-11, *supra* note 1424 at 172; see Comment Letter to SEC of Legg Mason Global Asset Management on File No. S7-15-18 (October 1, 2018), available at <https://www.sec.gov/comments/s7-15-18/s71518-4462516-175816.pdf> (“Legg Mason Letter”); See Comment Letter to SEC of Mutual Fund Directors Forum on File No. S7-15-18 (October 1, 2018), available at <https://www.sec.gov/comments/s7-15-18/s71518-4465585-175823.pdf> (“MFD Letter”)

¹⁷³¹ See Schwartz, *supra* note 1710.

¹⁷³² See *id.* at 122-123 & 128.

¹⁷³³ *Id.* at 130.

¹⁷³⁴ See Constable, *supra* note 1419.

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, *Lists of ETFs*, <https://www.etf.com/channels/> (accessed July 3, 2020).

¹⁷³⁶ See Constable, *supra* note 1419.

¹⁷³⁷ See Ontario Securities Commission, Behavioral Insights, *supra* note 1683 at 37.

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, *Costly Search and Mutual Fund Flows*, 53 J. FIN. 1589, 1614-16 (1998).

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.”¹⁷⁴⁰ 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.”¹⁷⁴¹ As noted, this is significant given the propensity for investor herds in ETFs.¹⁷⁴²

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.¹⁷⁴³ 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.”¹⁷⁴⁴ These are known as “anchors” and they can service as “an unintended reference point which influences subsequent value judgments.”¹⁷⁴⁵ 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.¹⁷⁴⁶ Yet these enhanced disclosures do not require a standardized layout.¹⁷⁴⁷ 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.”¹⁷⁴⁸ 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.¹⁷⁴⁹ While the SEC’s hope that competition

¹⁷⁴⁰ See Choi and Pritchard, *supra* note 1677 at 13; see Richard B. Carter & Steven Manaster, *Initial Public Offerings and Underwriter Reputation*, 45 J. FIN. 1045, 1056-66 (1990).

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.

¹⁷⁵³ See Pedro Nicolaci da Costa, *A Glaring New Conflict of Interest Undermines Public Trust in Federal Reserve*, FORBES (April 20, 2020), <https://www.forbes.com/sites/pedrodacosta/2020/04/20/a-glaring-new-conflict-of-interest-undermines-public-trust-in-federal-reserve/#579ec165135d>.

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.”)

¹⁷⁵⁵ See Cox & Payne, *supra* note 1637 at 930-93; Michael B. Mazis, Richard Staelin, Howard Beales & Steven Salop, *A Framework for Evaluating Consumer Information Regulation*, 45 J. MARKETING 11 (1981).

¹⁷⁵⁶ See J. Edward Russo, Gene Krieser & Sally Miyashita, *An Effective Display of Unit Price Information*, 39 J. MARKETING 11 (1975).

¹⁷⁵⁷ Cox & Payne, *supra* note 1637 at 931.

all information that is available will be readily processible,¹⁷⁵⁸ and information will be more effectively processed if it is delivered with adequate context.¹⁷⁵⁹ Effective “context” (also called “framing effects”) may also require particularly wording in disclosures.¹⁷⁶⁰ 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.”¹⁷⁶¹ Context is also needed for “common or familiar attributes” among competing choices.¹⁷⁶²

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.¹⁷⁶³ 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.¹⁷⁶⁴

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”¹⁷⁶⁵), and the end (the “recency

¹⁷⁵⁸ See J. Edward Russo, *The Value of Unit Price Information*, 14 J. MARKETING RES. 193 (1977).

¹⁷⁵⁹ See Slovic, *supra* note 1677; Paul Slovic, Melissa Finucane, Ellen Peters & Donald G. MacGregor, *Rational Actors or Rational Fools: Implications of the Affect Heuristic for Behavioral Economics*, 31 J. SOCIO-ECON. 329 (2002); Christopher K. Hsee, *The Evaluability Hypothesis: An Explanation for Preference Reversals between Joint and Separate Evaluations of Alternatives*, 67(3) ORGANIZATIONAL BEHAV. & HUM. DECISION PROCESSES, 247-257, 250 (1996); Kuepper, *supra* note 154.

¹⁷⁶⁰ See David Sally, *Conversation and Cooperation in Social Dilemmas: A Meta-Analysis of Experiments from 1958 to 1992*, 7 RATIONALITY & SOC’Y 58, 78 (1995).

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).

¹⁷⁶⁵ See AMERICAN PSYCHOLOGICAL ASSOCIATION, *Primacy Effect*, <https://dictionary.apa.org/primacy-effects> (last accessed July 4, 2020).

effect”¹⁷⁶⁶), of a document is more likely to be recalled than information contained in the middle.¹⁷⁶⁷ This concept was originally coined the “serial position effect” and it’s been used in technology to understand internet use habits,¹⁷⁶⁸ in advertising to influence behavior,¹⁷⁶⁹ and generally to enhance user experience across various domains including digital arts, interface and web design.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.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 *ex ante*,¹⁷⁷² our investor encounters significant heterogeneity in information presentation formats when looking across ten different ETF issuers (*Vanguard, Schwab, State Street Global Advisors, BlackRock, JP Morgan, Fidelity, Pacer, Invesco, First Trust and Vident*).¹⁷⁷³

¹⁷⁶⁶ See AMERICAN PSYCHOLOGICAL ASSOCIATION, *Recency Effect*, <https://dictionary.apa.org/recency-effect> (last accessed July 4, 2020).

¹⁷⁶⁷ See B.B. Murdock, *The serial position effect of free recall*, 64(5) JOURNAL OF EXPERIMENTAL PSYCHOLOGY, 482 (1962); A.M. Glenberg, M.M. Bradley, J.A. Stevenson, T.A. Kraus, M.J. Tkachuk, A.L. Gretz, J.H. Fish, & B.M. Turpin, B. M., *A two-process account of long-term serial position effects*, 6(4) JOURNAL OF EXPERIMENTAL PSYCHOLOGY: HUMAN LEARNING AND MEMORY, 355 (1980), available at <https://doi.org/10.1037/0278-7393.6.4.355>; Murray Glanzer & Anita R. Cunitz, *Two Storage Mechanisms in Free Recall*, 5(4) JOURNAL OF VERBAL LEARNING AND VERBAL BEHAVIOR 351 (1966), available at <https://www.sciencedirect.com/science/article/abs/pii/S0022537166800440>.

¹⁷⁶⁸ See Jamie Murphy, Charles Hofacker & Richard Mizerski, *Primacy and Recency Effects on Clicking Behavior*, 11(2) JOURNAL OF COMPUTER-MEDIATED COMMUNICATION 522 (2006), available at <https://academic.oup.com/jcmc/article/11/2/522/4617731>.

¹⁷⁶⁹ See W. Scott Terry, *Serial Position Effects in Recall of Television Commercials*, 132(2) J. GEN. PSYCHOLOGY 151-163 (2005), available at <https://pubmed.ncbi.nlm.nih.gov/15871298/>.

¹⁷⁷⁰ See Euphemia Wong, *Serial Position Effect: How To Create Better User Interfaces*, INTERACTION DESIGN FOUNDATION (2018), <https://www.interaction-design.org/literature/article/serial-position-effect-how-to-create-better-user-interfaces>.

¹⁷⁷¹ See Rule 6c-11, *supra* note 1424 at 187.

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, *Equity: U.S. Real Estate*, https://www.etf.com/Equity_U_S_Real_Estate (accessed July 4, 2020).

¹⁷⁷³ Compare and contrast the website layouts and design for *Vanguard* Real Estate ETF (VNQ), <https://investor.vanguard.com/etf/profile/overview/vnq>; *Schwab* U.S. REIT ETF, <https://www.schwabfunds.com/products/schh>; *State Street Global Advisors*, The Real Estate Select Sector SPDR® Fund, <https://www.ssga.com/us/en/individual/etfs/funds/the-real-estate-select-sector-spdr-fund-xlre>; *BlackRock* iShares U.S. Real Estate ETF, <https://www.ishares.com/us/products/239520/ishares-us-real-estate-etf>; *JPMorgan* BetaBuilders MSCI US REIT ETF, <https://am.jpmorgan.com/us/en/asset-management/gim/adv/products/d/jpmorgan-betabuilders-msci-us-reit-etf-etf-shares->

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.¹⁷⁷⁴

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)¹⁷⁷⁵ 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.”¹⁷⁷⁶ A “hard to evaluate” attribute is one where “the evaluator does not know how good a given value on the attribute is without comparisons.”¹⁷⁷⁷ An “easy to evaluate” attribute is one that can independently ascertained.¹⁷⁷⁸ 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.¹⁷⁷⁹ He found that when evaluating options separately, evaluators “base their evaluation chiefly on the easy-to-evaluate attribute alone,”¹⁷⁸⁰ while in a joint

46641q738; *Fidelity* MSCI Real Estate Index ETF, <https://institutional.fidelity.com/app/funds-and-products/etf/snapshot/FIIS ETF FREL/fidelity-msci-real-estate-index-etf.html>; *Pacer* Benchmark Data & Infrastructure Real Estate SCTR ETF, <https://www.paceretfs.com/products/srvr>; *Invesco* KBW Premium Yield Equity REIT ETF, <https://www.invesco.com/us/financial-products/etfs/product-detail?ticker=KBWY>; *First Trust* E&P REIT Index Fund (FRI), <https://www.ftportfolios.com/retail/etf/etfsummary.aspx?Ticker=FRI>; *Vident* PPTY, U.S. Diversified Real Estate ETF, <https://www.videntfunds.com/funds/ppty> (all ETF websites last accessed July 4, 2020).

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.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.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.”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.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.”¹⁷⁸⁵

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

¹⁷⁸¹ *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.”)

¹⁷⁸² *Id.* at 256.

¹⁷⁸³ Hsee *supra* note 1759 at 249.

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.”)

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.¹⁷⁸⁶ 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.”¹⁷⁸⁷ Thus opaque or hidden, but still potentially material, indirect expenses incurred from holding ETFs, like tracking errors,¹⁷⁸⁸ or transacting at a price premium or discount to NAV,¹⁷⁸⁹ 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.¹⁷⁹⁰ This effect is exacerbated by a phenomenon known as “hyperbolic discounting” where long-term impacts are less focused on than near term-effects.¹⁷⁹¹ 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.¹⁷⁹² ETF’s marketed as “no-fee” might be capitalizing on this effect, despite having expenses associated with underlying assets.¹⁷⁹³

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

¹⁷⁸⁶ See Ontario Securities Commission, Improving Fee Disclosure, *supra* note 1683 at 16; D. Prelec & G. Loewenstein, *The red and the black: Mental accounting of savings and debt*, 17(1) MARKETING SCIENCE 4 (1998).

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).

¹⁷⁹² See Ontario Securities Commission, Behavioral Insights, *supra* note 1683 at 33.

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,¹⁷⁹⁴ and aid investor comprehension through “plain language” guidelines.¹⁷⁹⁵ Rule 6c-11 makes several disclosure amendments, many of which help investors compare ETFs falling within the scope of the rule.¹⁷⁹⁶ 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.¹⁷⁹⁷ It also requires table and line graphs for days where ETFs trade at a premium or

¹⁷⁹⁴ See U.S. SEC. & EXCH. COMM’N, Request for Comment on the Effectiveness of Financial Disclosures About Entities Other than the Registrant, Securities Act Release No. 9929, Exchange Act Release No. 75,985, Investment Company Act Release No. 31,849, 80 Fed. Reg. 59,083 (Oct. 1, 2015); see U.S. SEC. & EXCH. COMM’N, *Accounting and Disclosure Information Improving Principal Risks Disclosure*, ADI 2019-08, https://www.sec.gov/investment/accounting-and-disclosure-information/principal-risks/adi-2019-08-improving-principal-risks-disclosure#_ftn1.

¹⁷⁹⁵ See U.S. SEC. & EXCH. COMM’N, *A Plain English Handbook: How to Create Clear SEC Disclosure Documents* (1998), available from <https://www.sec.gov/pdf/handbook.pdf>.

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,¹⁷⁹⁸ along with commentary on material factors contributing to prolonged dislocations.¹⁷⁹⁹ 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.¹⁸⁰⁰ 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).¹⁸⁰¹ 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.¹⁸⁰² Also, it is uncertain the extent an ETF sponsor can precisely determine the material factors contributing NAV dislocation in its commentaries.¹⁸⁰³

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”).¹⁸⁰⁴ 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.¹⁸⁰⁵ 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.¹⁸⁰⁶ At the

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.”)

¹⁸⁰⁰ *See* Comment Letter to SEC of Wisdom Tree Asset Management, Inc. on File No. S7-15-18 (October 1, 2018), at 10, available at <https://www.sec.gov/comments/s7-15-18/s71518-4466240-175829.pdf> (“Wisdom Tree Comment Letter”) (stating that a line graph alone would be better for investors); *See* Comment Letter to SEC of John Hancock Investments on File No. S7-15-18 (October 1, 2018), at 4, available at <https://www.sec.gov/comments/s7-15-18/s71518-4467046-175800.pdf> (“John Hancock Comment Letter”) (advocating for removal of the line graph and only providing a table).

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”)

¹⁸⁰³ Rule 6c-11 *supra* note 1424 at 106; *See* SSGA Comment Letter I, *supra* note 1802 at 13.

¹⁸⁰⁴ *Id.* at 61.

¹⁸⁰⁵ *Id.* at 61-62.

¹⁸⁰⁶ *Id.* at 62, 64; *See* SSGA Comment Letter I, *supra* note 1802 at 7 (positing that the publication of the IIV could potentially increase investor confusion); Legg Mason Letter, *supra* note 1730 (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.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.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).¹⁸⁰⁹

The choice to eliminate intraday IIV was controversial, as many consider IIV to be useful to retail investors.¹⁸¹⁰ One commenter to Rule 6c-11 expressed stark cynicism at its removal, implying that opacity clearly favored the ETF industry over investors.¹⁸¹¹ Nasdaq suggested that providing IIV allows an

limitations" and lack precision in regards to international securities and fixed income underlying assets); See Comment Letter to SEC of JP Morgan on File No. S7-15-18 (October 1, 2018), at 6-7, available at <https://www.sec.gov/comments/s7-15-18/s71518-4467032-175830.pdf> ("JP Morgan Comment Letter").

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.

¹⁸⁰⁸ See Peter J. Shea, Trayne S. Wheeler, Alyssa B. Sherman & Uri S. Segelman, *New Listing Rules Adopted for ETFs Relying on Rule 6c-11 – Exchanges' ETF Listing Compliance Burdens Reduced*, U.S. INVESTMENT MANAGEMENT ALERT, K&L GATES (May 5, 2020), <http://www.klgates.com/new-listing-rules-adopted-for-etfs-relying-on-rule-6c-11--exchanges-etf-listing-compliance-burdens-reduced-05-05-2020/> ("The SEC approved the proposed rule changes for CBOE to adopt Rule 14.11(l), Nasdaq to adopt Rule 5704, and NYSE Arca to adopt Rule 5.2-E(j)(8), each governing the listing and trading of shares of relying ETFs.")

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.")

¹⁸¹⁰ See Angel Comment Letter, *supra* note 1615 at 1; Comment Letter to SEC of Nasdaq, Inc. on File No. S7-15-18 (September 28, 2018), at 6, available at <https://www.sec.gov/comments/s7-15-18/s71518-4451170-175713.pdf> ("Nasdaq Comment Letter"); Comment Letter to SEC of CFA Institute on File No. S7-15-18 (November 15, 2018) at 5, available at <https://www.sec.gov/comments/s7-15-18/s71518-4652219-176478.pdf> ("CFA Comment Letter"); Comment Letter to SEC of ICE Data Services on File No. S7-15-18 (October 1, 2018), at 1-3, available at <https://www.sec.gov/comments/s7-15-18/s71518-4463567-175821.pdf> ("IDS Comment Letter") ("IDS believes that the current Intraday Indicative Value ("IIV") process adds transparency to the market, particularly for retail investors"); Comment Letter to SEC of Segment Wealth Management LLC, on File No. S7-15-18 (September 26, 2018), available at <https://www.sec.gov/comments/s7-15-18/s71518-4487260-175837.pdf> ("Segment Letter"); Comment Letter to SEC of NYSE on File No. S7-15-18 (October 10, 2018), at 3-4, available at <https://www.sec.gov/comments/s7-15-18/s71518-4506043-175977.pdf> ("NYSE Comment Letter").

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.¹⁸¹² Others noted that IIV may be the only intraday pricing mechanism that is available to retail investors,¹⁸¹³ and the only intraday way to know if an ETF is trading a significant premium or discount to NAV.¹⁸¹⁴ 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.¹⁸¹⁵

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.¹⁸¹⁶ Also, recent empirical studies suggest that the potential for investor herding increases if IIV is not available.¹⁸¹⁷ Investors also benefit from knowing when prices deviate from NAV during the trading day since, unlike mutual funds, they cannot redeem directly at NAV.¹⁸¹⁸ 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.¹⁸¹⁹ 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).¹⁸²⁰

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.

¹⁸¹⁶ Comment Letter to SEC of Fixed Income Market Structure Advisory Committee on File No. S7-15-18 (October 29, 2018) at 5, available at <https://www.sec.gov/comments/s7-15-18/s71518-4587743-176289.pdf> (“FIMSAC Comment Letter”)

¹⁸¹⁷ Bhattachaya & 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-11.¹⁸²¹ It also amended Form N-1A in several respects to make cost disclosures more transparent, and easier to understand for ETF investors.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.¹⁸²³ It provides ETF investors with information about ETF trading and other costs.¹⁸²⁴ ETFs relying on Rule 6c-11 must now provide additional disclosure around actual trading costs when investors buy and sell ETF shares.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.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.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,¹⁸²⁸ a streamlined obligation to provide “narrative disclosures” in relation to bid-ask spreads to better contextualize costs in context,¹⁸²⁹ and daily website disclosure of “median bid-ask spreads calculated over the most recent 30-day period.”¹⁸³⁰ The latter requirement was criticized as being potentially misleading (since it’s only one aspect of trading costs).¹⁸³¹ Rule 6c-11 also removed certain disclosures from

¹⁸²¹ Rule 6c-11 *supra* note 1424 at 147.

¹⁸²² See *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).

¹⁸²³ See U.S. SEC. & EXCH. COMM’N, *Form N-1A*, <https://www.sec.gov/files/formn-1a.pdf>.

¹⁸²⁴ See Rule 6c-11 *supra* note 1424 at 133.

¹⁸²⁵ *Id.* 136-137.

¹⁸²⁶ See Oppenheimer Funds Comment Letter, *supra* note 1531 at 4.

¹⁸²⁷ Rule 6c-11 *supra* note 11 at 137.

¹⁸²⁸ *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.”)

¹⁸²⁹ See *id.* at 139 This move had industry support, see Comment Letter to SEC of the ETF Committee of the Asset Management Group of the Securities Industry and Financial Markets Association on File No. S7-15-18 (February 22, 2019), at 2, available at <https://www.sec.gov/comments/s7-15-18/s71518-4967859-178906.pdf> (“SIFMA Comment Letter II”)

¹⁸³⁰ See Rule 6c-11, *supra* note 1424 at 109.

¹⁸³¹ See Comment Letter to SEC of Franklin Templeton Investments on File No. S7-15-18 (October 1, 2018), at 2, available at <https://www.sec.gov/comments/s7-15-18/s71518-4467035-175832.pdf> (“Franklin Comment Letter”); John Hancock Comment Letter, *supra* note 1800 at 2-3.

Form N-1A, including duplicative information that is provided in Form N-CEN.¹⁸³² Form N-CEN provides information to the SEC on an annual basis from ETF issuers, similar to a census.¹⁸³³ 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-11.¹⁸³⁴

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,¹⁸³⁵ Form N-PORT,¹⁸³⁶ and Regulation S-X.¹⁸³⁷ Rule 6c-11 avoided imposing “supplemental disclosures” if, within limited allowable and extraordinary circumstances, an ETF suspended the issuance of creation units.¹⁸³⁸ 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.”¹⁸³⁹

¹⁸³² Rule 6c-11 *supra* note 1424 at 144.

¹⁸³³ See Investment Company Reporting Modernization Adopting Release, Investment Company Act Release No. 32314 (Oct. 13, 2016) [81 FR 81870 (Nov. 18, 2016)]

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.)

¹⁸³⁷ See 17 CRF Part 210; Regulation S-X provides form, requirements and content for financial statements, U.S. SEC. & EXCH. COMM’N, Rules, Regulations and Schedules, <https://www.sec.gov/divisions/corpfin/ecfrlinks.shtml>.

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.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.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,¹⁸⁴² a move which garnered significant industry support.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.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,¹⁸⁴⁵ quantities of securities held, and percentage weights of the portfolio.¹⁸⁴⁶ The SEC rejected, however, the idea of adjusting disclosures in alignment with other investment products.¹⁸⁴⁷ It also disallowed its utilization by

¹⁸⁴⁰ Loewenstein, Sunstein & Golman, *supra* note 1684 at 406.

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).

¹⁸⁴² See Rule 6c-11, *supra* note 1424 at 74-75.

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”)

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.

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.

¹⁸⁴⁶ See Rule 6c-11, *supra* note 1424 at 76-77

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,¹⁸⁴⁸ despite some industry support for all ETF sponsors being brought under a similar approval framework.¹⁸⁴⁹

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.”¹⁸⁵⁰ A structured layout was not required under the new rule,¹⁸⁵¹ despite having significant industry support for a standardized approach.¹⁸⁵² 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.”¹⁸⁵³ 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.”¹⁸⁵⁴ 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”).¹⁸⁵⁵ Thus, the JDM principles of prominence and disclosure ordering, including varied screen designs for mobile and desktop viewing platforms,¹⁸⁵⁶ are important to consider in designing a standardized layout and should be further studied.¹⁸⁵⁷

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.¹⁸⁵⁸ One scholar has called this a “collective active problem” for investment managers to devise an “optimal layout” on their own.¹⁸⁵⁹ 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.¹⁸⁶⁰ Regrettably, the SEC rejected an EDGAR-style filing requirement in Rule 6c-11 for portfolio holding information, despite support from prominent industry stakeholder *Morningstar*,¹⁸⁶¹ as well as FIMSAC,¹⁸⁶² citing increased costs on ETF sponsors.¹⁸⁶³

Knowing how an ETF attribute compares with similar products is critical for investors when making an “informed choice.”¹⁸⁶⁴ Disclosures made available through firm websites and prospectus are both “cumbersome” and impede easy analysis and comparability.¹⁸⁶⁵ 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.¹⁸⁶⁶ It would also be “machine readable,” and could be tagged for easier automated aggregation and comparative analysis by software programs.¹⁸⁶⁷ It would also allow for easier investor comparative assessments of matters such as portfolio holdings without

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.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.”¹⁸⁷⁵ Another area of potential standardization that has been suggested in the literature is to use a metric based on “value at risk” (VAR).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.”¹⁸⁷⁷ VAR has, however, been significantly criticized for its predictive shortcomings and potentially “destabilizing” impact.¹⁸⁷⁸

A further item of required disclosure that lacks calculation uniformity is the bid-ask spread.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.¹⁸⁸⁰ The data used to calculate bid-ask can vary and this can impair investor comparatives.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.¹⁸⁸² Support for this amendment was varied and some commentators suggested it could overemphasize certain costs (while obscuring others) and mislead investors.¹⁸⁸³

¹⁸⁷⁴ See NYSE Comment Letter, *supra* note 1810 at 3-4; Eaton Vance Comment Letter, *supra* note 1528 at 3.

¹⁸⁷⁵ FIMSAC Comment Letter, *supra* note 1816 at 5.

¹⁸⁷⁶ See M. Hassine & T. Roncalli, *Measuring Performance of Exchange-Traded Funds*, 4(3) THE JOURNAL OF INDEX INVESTING, 57, 57 (2013).

¹⁸⁷⁷ See Dorocáková, *supra* note 1493 at 157.

¹⁸⁷⁸ See Erin Lockwood, *Predicting the unpredictable: Value-at-risk, performativity, and the politics of financial uncertainty*, 22(4) REV. OF INT. POL. ECON. 719 (2015).

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.”)

¹⁸⁸⁰ Rule 6c-11 *supra* note 1424 at 110-112

¹⁸⁸¹ See SIFMA Comment Letter I, *supra* note 1425 at 19; CSIM Comment Letter, *supra* note 1545 at 11.

¹⁸⁸² Rule 6c-11 *supra* note 1424 at 113.

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

Another commenter suggested a discussion of examples would be useful.¹⁸⁸⁴ Ultimately the bid-ask spread examples and interactive calculator was jettisoned by the SEC in its final rule.¹⁸⁸⁵

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.¹⁸⁸⁶ This has changed over time, and scholars and regulators are now interested in how investment disclosures can be strengthened through behaviorally-enhanced presentation formats.¹⁸⁸⁷ Scholarship also recognizes the “limits” of disclosure, even for sophisticated investors.¹⁸⁸⁸ 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.”¹⁸⁸⁹ A simple review of key documents in the ETF informational ecosystem (prospectus and SAI) reveal dense text-laden formats lacking for

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.

¹⁸⁸⁶ See Talia B. Gillis, *Putting Disclosure To The Test: Toward Better Evidence-Based Policy*, 28 LOY. CONSUMER L. REV. 31, 50 (2015).

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.

¹⁸⁸⁸ See Steven M. Davidoff & Claire A. Hill, *Limits of Disclosure*, 36 SEATTLE U. L. REV. 599, 623 (2013).

¹⁸⁸⁹ IOSCO Report, *supra* note 1683 at 11-12

intention direction.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.¹⁸⁹¹ This is equally applicable to ETFs. Contextual improvements can be found in Rule 6c-11;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.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.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.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,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.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.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);¹⁸⁹⁹ however, a single, standardized, centrally controlled and hosted, calculator as proposed by BlackRock would aid investor comparative assessments.¹⁹⁰⁰

¹⁸⁹⁰ See case study identified in *supra* note 1715.

¹⁸⁹¹ See Cox & Payne, *supra* note 1637 at 911.

¹⁸⁹² See *infra* Part III(a).

¹⁸⁹³ Rule 6c-11, *supra* note 1424 at 204.

¹⁸⁹⁴ *Id.* at 204.

¹⁸⁹⁵ See Ontario Securities Commission, Behavioral Insights, *supra* note 1683 at 13.

¹⁸⁹⁶ *Id.* at 15.

¹⁸⁹⁷ *Id.* at 16

¹⁸⁹⁸ See BlackRock Comment Letter, *supra* note 1451 at 18.

¹⁸⁹⁹ Rule 6c-11, *supra* note 1424 at 114.

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.¹⁹⁰¹ Rule 6c-11 didn't impose marketing rules on ETF issuers, despite measures required by prior exemptive orders.¹⁹⁰² 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).¹⁹⁰³ Not all industry participants agree that investors understand ETF's subtle (and explicit) distinctions from mutual funds sufficiently to disregard this disclosure.¹⁹⁰⁴ 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,¹⁹⁰⁵ and that ETFs have unique risks because of their operational structure.¹⁹⁰⁶ 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,¹⁹⁰⁷ or have embedded redemption rights for issuers like those found in exchange traded notes (ETNs),¹⁹⁰⁸ 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-11.¹⁹⁰⁹ The SEC chose not to include a naming

¹⁹⁰¹ 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")

¹⁹⁰² See Rule 6c-11, *supra* note 1424 at 115.

¹⁹⁰³ *Id.*

¹⁹⁰⁴ 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.")

¹⁹⁰⁵ See CFA Comment Letter, *supra* note 1810 at 5-6.

¹⁹⁰⁶ See *id.* at 3

¹⁹⁰⁷ See Rule 6c-11, *supra* note 1424 at 26.

¹⁹⁰⁸ 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.)

¹⁹⁰⁹ See discussion on this point in Rule 6c-11, *supra* note 1424 at 30, 198, 210.

convention in Rule 6c-11,¹⁹¹⁰ despite significant industry support for such a taxonomy.¹⁹¹¹ 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.¹⁹¹² 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.¹⁹¹³ A naming convention would serve immediate value in distinguishing leveraged and inverse ETPs and ETNs from ETFs.¹⁹¹⁴ This is timely, since ill-advised ETN exposures wreaked havoc on some retail investor portfolios in the coronavirus pandemic – giving rise to new litigation.¹⁹¹⁵ Also, ETN credit risk isn’t always reflected in secondary market trading prices.¹⁹¹⁶ A formalized taxonomy for ETPs (distinguishing ETFs) will require more industry consultation,¹⁹¹⁷ and potential frameworks have been advanced by both *FIMSAC*¹⁹¹⁸ and *BlackRock*.¹⁹¹⁹ 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.¹⁹²⁰

¹⁹¹⁰ *Id.* at 118.

¹⁹¹¹ See BlackRock Comment Letter, *supra* note 1451 at 25-27; Invesco Comment Letter, *supra* note 1425 at 19; CBOE Comment Letter, *supra* note 1545 at 6; FIMSAC Comment Letter *supra* note 1816 at 1-4; see Comment Letter to SEC of Professor Henry T.C. Hu and John D. Morley on File No. S7-15-18 (August 27, 2018), at 2, available at <https://www.sec.gov/comments/s7-15-18/s71518-4267989-173128.pdf> (“Hu and Morley Comment Letter”); Virtu Comment Letter, *supra* note 1545 at 2.

¹⁹¹² Hu & Morely 2, *supra* note 1459 at 1177.

¹⁹¹³ *Id.* at 1182.

¹⁹¹⁴ See Bhattachaya & 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

¹⁹¹⁶ See B. Cserna, A. Levy, and Z. Weiner. *Counterparty Risk in Exchange-Traded Notes (ETNs)* 23(1) JOURNAL OF FIXED INCOME 76 (2013).

¹⁹¹⁷ See Comment Letter to SEC of State Street Global Advisors on File No. S7-15-18 (February 4, 2019), at 2-3, available at <https://www.sec.gov/comments/s7-15-18/s71518-4875042-177427.pdf> (“SSGA Comment Letter II”).

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.¹⁹²¹ Empirical testing of disclosure is fraught with difficulty and uncertainty.¹⁹²² In essence, any attempt to simplify ETF disclosures is an act of “streamlining the environments” where investors synthesize information to make decisions.¹⁹²³ 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.¹⁹²⁴ 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.”¹⁹²⁵ Yet as noted by Professor Troy Paredes, “sunlight can also be blinding.”¹⁹²⁶ Streamlining ETF disclosures helps to overcome “present bias” and aversions to search efforts to find the most suitable investment products.¹⁹²⁷ It also reduces the “task size” of the cognitive ask of disclosure review, which can lead to better decision making.¹⁹²⁸ 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.¹⁹²⁹

¹⁹²¹ See Omri Ben-Shahar & Carl E. Schneider, *The Failure of Mandated Disclosure*, 159 U. PA. L. REV. 647 (2011); Ryan Bubb, *TMI? Why the Optimal Architecture of Disclosure Remains TBD*, 113 MICH. L. REV. 6 (2015); Lauren Willis, *Decision-making and the Limits of Disclosure: The Problem of Predatory Lending: Price*, 65 MD. L. REV. 707, 712, 718 (2006); Choi and Pritchard, *supra* note 1677 at 60-61; Paredes, *supra* note 1679 at 421-430; Schwartz, *supra* note 1841 at 569-570.

¹⁹²² See Gillis, *supra* note 1886 at 32-34.

¹⁹²³ See Ontario Securities Commission, Behavioral Insights, *supra* note 1683 at 11.

¹⁹²⁴ *The Dog and the Frisbee*, Speech by Mr. Andrew G Haldane, Executive Director, Financial Stability, Bank of England, and Mr Vasileios Madouros, Economist, Bank of England, at the Federal Reserve Bank of Kansas City’s 366th economic policy symposium, “The changing policy landscape”, Jackson Hole, Wyoming (August 31, 2012) available at <https://www.bis.org/review/r120905a.pdf>.

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.¹⁹³⁰ A centralized comparative mechanism would help filter irrelevant information, which some studies have shown to be decision making distractions.¹⁹³¹ 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.”¹⁹³²

Presentation format has also been found to have a material impact on how consumers process information.¹⁹³³ 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.¹⁹³⁴ Simplified disclosures have also increased the effectiveness of tax credit and employer 401(k) programs.¹⁹³⁵ 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.¹⁹³⁶

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.

¹⁹³³ See James R. Bettman & Pradeep Kakkar, *Effects of Information Presentation Format on Consumer Information Acquisition Strategies*, 3 J. CONSUMER RES. 233 (1977).

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.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.”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.¹⁹³⁹ It is also worthwhile to further study the use of visuals, computer aided graphics or other interactive components that create a “vivid display,”¹⁹⁴⁰ as these are likely to be more compelling to investors in illustrating ETF arbitrage rather than simple text overlay.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.¹⁹⁴² *Morningstar* has advocated that index methodology be provided in a “standardized format” upon ETF launch, and include “rules regarding securities selection and weighting.”¹⁹⁴³ Index construction methodology disclosure reform has also been advocated by industry stakeholders.¹⁹⁴⁴ Appropriately, as noted by the *Index Industry Association*, such a move will also require further investigation on how to appropriately “balance”

¹⁹³⁷ See Loewenstein, Sunstein & Golman, *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.”); 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.”)

¹⁹³⁸ See Hu & Morley 2, *supra* note 1459 at 1162.

¹⁹³⁹ *Id.* at 1175.

¹⁹⁴⁰ Loewenstein, Sunstein & Golman, *supra* note 1684 at 410.

¹⁹⁴¹ See Ontario Securities Commission, Behavioral Insights, *supra* note 1683 at 15.

¹⁹⁴² See Robertson, *supra* note 1440 at 843-844.

¹⁹⁴³ See Morningstar Comment Letter, *supra* note 1784 at 2.

¹⁹⁴⁴ See ETF.com Comment Letter, *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

¹⁹⁴⁵ See Comment Letter to SEC of Index Industry Association on File No. S7-15-18 (July 3, 2018), at 3, available at <https://www.sec.gov/comments/s7-15-18/s71518-4467034-175831.pdf> ("IIA Comment Letter")

¹⁹⁴⁶ See Marco Pagano, Antonio Sanchez Serrano & Josef Zechner, *Can ETFs Contribute To Systemic Risk?* REPORTS OF THE ADVISORY SCIENTIFIC COMMITTEE NO.9, EUROPEAN SYSTEMIC RISK BOARD (June 2019), 3-4, 28-29, https://www.esrb.europa.eu/pub/pdf/asc/esrb.asc190617_9_canetfscontributesystemicrisk~983ea11870.en.pdf.

¹⁹⁴⁷ See Katherine Greifeld, *Cash-Like ETFs See \$3 Billion Exit After Fed Steps Into Market*, BLOOMBERG (March 30, 2020), <https://sites.law.duke.edu/thefinregblog/2020/04/03/what-have-we-learned-so-far-about-etfs-in-the-covid-19-crisis/#comment-668>.

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").

¹⁹⁵⁰ See Clements, *supra* note 3 at 839-841; Martin Kacperczyk & Philipp Schnabl, *When Safe Proved Risky: Commercial Paper during the Financial Crisis of 2007-2009*, 24(1) J. OF ECON. PERSPECTIVES. 29, 34-7 (2010).

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 though 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).

¹⁹⁵⁵ See Eva Su, *Money Market Mutual Funds: A Financial Stability Case Study*, CONGRESSIONAL RESEARCH SERVICE, IN Focus (March 24, 2020), available at <https://crsreports.congress.gov/product/pdf/IF/IF11320>.

¹⁹⁵⁶ See Bhattachaya & O’Hara, *supra* note 1460 at 6.

¹⁹⁵⁷ For a review of the safeguards in MMMFs after the 2008 crisis, *see* U.S. SEC. & EXCH. COMM’N, *SEC Adopts Money Market Fund Reform Rules*, (July 23, 2014), <https://www.sec.gov/news/press-release/2014-143#:~:text=Website%20Disclosure%20%E2%80%93%20Money%20market%20funds,use%20of%20affiliate%20sponsor%20support>.

governing false or misleading statements.¹⁹⁵⁸ 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 portfolio¹⁹⁵⁹ – since these comparative tools are inaccessible to many retail investors.¹⁹⁶⁰ Also, as ETF heavyweights like *BlackRock* and *Fidelity* look to enter the non-transparent ETF space,¹⁹⁶¹ the use of these and actively managed ETFs in model portfolios will make investor comparisons even more difficult.¹⁹⁶²

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.¹⁹⁶³ 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.¹⁹⁶⁴ This bears particular weight given evidence that investors often purchase funds based on historical returns, not fund specific features.¹⁹⁶⁵

¹⁹⁵⁸ See Loder, *supra* note 1647.

¹⁹⁵⁹ See Barbara Novick, *How Index Funds Democratize Investing*, THE WALL STREET JOURNAL (January 8, 2017), <https://www.wsj.com/articles/how-index-funds-democratize-investing-1483914571>.

¹⁹⁶⁰ Loder, *supra* note 1647.

¹⁹⁶¹ See Claire Ballentine & Annie Massa, *BlackRock Files to License Active Non-Transparent ETF Structure*, BLOOMBERG (June 3, 2020), <https://www.bloomberg.com/news/articles/2020-06-03/blackrock-moves-ahead-on-plan-for-etf-that-keeps-holdings-secret>; Katherine Greifeld, *Fidelity Throws Heft Into Hidden-Asset ETF Arena With New Funds*, BLOOMBERG (June 3, 2020), <https://www.bloomberg.com/news/articles/2020-06-04/fidelity-throws-heft-into-hidden-asset-etf-arena-with-new-funds>.

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.”)

¹⁹⁶³ See Sam Bourgi, *Understanding the Role of ETFs in Retirement Planning*, ETFDB.COM (January 22, 2019), <https://etfdb.com/etf-education/understanding-role-of-etfs-in-retirement-planning/>.

¹⁹⁶⁴ See Alan R. Palmiter & Ahmed E. Taha, *Mutual Fund Performance Advertising: Inherently and Materially Misleading*, 46 GA. L. REV. 289 (2012) (discussing the problems that occur when mutual funds use past performance to market mutual funds, and also discussing how advertising in the mutual fund industry is regulated by the Federal Trade Commission rather than the SEC).

¹⁹⁶⁵ See Alan R. Palmiter & Ahmed E. Taha, *Mutual Fund Investors: Divergent Profiles*, 2008 COLUM. BUS. L. REV. 934, 940-44, 974-1008 (2008); Noel Capon, Gavan J. Fitzsimons & Russ

vi. Conclusion

ETFs have many benefits and have become very popular.¹⁹⁶⁶ Yet, ETFs may also be contributing to investor herd formation,¹⁹⁶⁷ impairing the information efficiency and price responsiveness of underlying assets,¹⁹⁶⁸ and exacerbating volatility and disruptive market events.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

Alan Prince, *An Individual Level Analysis of the Mutual Fund Investment Decision*, 10 J. FIN. SERVS. RESEARCH 59, 66 (1996); Ronald T. Wilcox, *Bargain Hunting or Star Gazing? Investors' Preferences for Stock Mutual Funds*, 76 J. BUS. 645, 648 (2003); Diane Del Guercio & Paula A. Tkac, *The Determinants of the Flow of Funds of Managed Portfolios: Mutual Funds vs. Pension Funds*, 37 J. FIN. & QUANTITATIVE ANALYSIS 523, 525 (2002); Erik R. Sirri & Peter Tufano, *Costly Search and Mutual Fund Flows*, 53 J. FIN. 1589, 1598 (1998); Travis Sapp & Ashish Tiwari, *Does Stock Return Momentum Explain the "Smart Money" Effect?*, 59 J. FIN. 2605, 2607 (2004).

¹⁹⁶⁶ The popularity 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, *Portfolio Selection*, 7(1) J. FIN 77 (1952); William F. Sharpe, *Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk*, 19(3) J. FIN 425 (1964); J. Lintner, *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, *supra* note 1416 at 17-23.

¹⁹⁶⁷ See Bhattachaya & O'Hara, *supra* note 1460 at 6-7.

¹⁹⁶⁸ This occurs because ETF investors favor the "systematic" factor of risk over asset specific "idiosyncratic" factors, see *id.* at 1-2.

¹⁹⁶⁹ *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, *Libertarian Paternalism Is Not an Oxymoron*, 70 U. CHI. L. REV. 1159, 1159 (2003)

¹⁹⁷¹ See Ryan Bubb & Richard H. Pildes, *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 Government,’* BLOOMBERG QUINT (May 21, 2020), <https://www.bloombergquint.com/businessweek/how-larry-fink-s-blackrock-is-helping-the-fed-with-bond-buying>.

¹⁹⁷⁶ See Dirk Andreas Zetsche, William A Birdthistle, Douglas W Arner, & Ross P. Buckley, *Financial Operating Systems*, EUROPEAN BANKING INSTITUTE (EBI) WORKING PAPER SERIES NO. 58/2020 ((March 1, 2020), available at <https://ssrn.com/abstract=3532975>).

¹⁹⁷⁷ See Tett, *supra* note 1471.

to effectively predict or guard against prior crises, operational failures, or disruptive market events.¹⁹⁷⁸

¹⁹⁷⁸ See J.H. Biggs, *Wall Street's Management of Risk: Why It Failed*, in M. Pinedo & I. Walter (eds) *GLOBAL ASSET MANAGEMENT*, 167 (2015).

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

¹⁹⁷⁹ See Greta R. Krippner, *The Financialization of the American Economy*, 3 SOCIO-ECONOMIC REVIEW 173, 174 (2005); Mike Konczal & Neil Abernathy, *Defining Financialization*, ROOSEVELT INSTITUTE (July 27, 2015), <http://rooseveltinstitute.org/defining-financialization/>; Robert C. Hockett & Saule T. Omarova, *The Finance Franchise*, 102 CORNELL L. REV. 1143, 1148-1149 (2017).

¹⁹⁸⁰ See Thomas Philippon & Ariell Reshef, *Wages and Human Capital in the U.S. Financial Industry: 1909-2006*, NBER WORKING PAPER NO. 14644, at 75, 93-94 (January 2009).

¹⁹⁸¹ Krippner, *supra* 1979 at 174.

¹⁹⁸² *Id.* see discussion at 176; see Louis-Philippe Rochon, *More Regulations Needed To Survive Financialization In The West*, CBC OPINION (March 22, 2015), <https://www.cbc.ca/news/canada/manitoba/more-regulations-needed-to-survive-financialization-in-the-west-1.3004869>; Celine Baud & Eve Chiapello, *How The Financialization of Firms Occurs: The Role of Regulation and Management Tools: The Case of Bank Credit*, 56(3) REVUE FRANÇAISE DE SOCIOLOGIE 204 (2015).

¹⁹⁸³ See K. PHILLIPS, *ARROGANT CAPITAL: WASHINGTON, WALL STREET, AND THE FRUSTRATION OF AMERICAN POLITICS* (1st ed. 1996).

¹⁹⁸⁴ See Thomas I. Palley, *Financialization: What It Is and Why It Matters*, WORKING PAPERS WP153, POLITICAL ECONOMY RESEARCH INSTITUTE, UNIVERSITY OF MASSACHUSETTS AT AMHERST, 4 (2007).

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.”¹⁹⁸⁵ 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.¹⁹⁸⁶

Researchers trace the origins of financialization in the U.S. to numerous events starting as early as the nineteenth century¹⁹⁸⁷ onset through demographic changes,¹⁹⁸⁸ globalization,¹⁹⁸⁹ sector specialization and increased household savings,¹⁹⁹⁰ increased financial service firm prominence,¹⁹⁹¹ and direct social and political engineering.¹⁹⁹² The growth of “shadow banking” has also been cited,¹⁹⁹³ as has greater demand for investment management services,¹⁹⁹⁴ and an explosion of “household credit” (including residential mortgages and consumer debt).¹⁹⁹⁵

One study suggests that financialization took place in four “phases.”¹⁹⁹⁶ The first from the turn of the 20th century until after the *New Deal*; a second

¹⁹⁸⁵ See J. Froud, C. Haslam, S. Johal & K Williams, *Shareholder Value and Financialization: Consultancy Promises, Management Moves*, 29 ECONOMY AND SOCIETY 80 (2000).

¹⁹⁸⁶ See Palley, *supra* note 1984 at 16-18.

¹⁹⁸⁷ See Thomas Philippon, *Brief: Finance, Productivity, and Distribution*, BROOKINGS INSTITUTE GLOBAL ECONOMY AND DEVELOPMENT (October 2016), <https://www.brookings.edu/wp-content/uploads/2018/01/philippon-october-2016.pdf>; Suzanne J. Konzelmann, Marc Fovargue-Davies, & Frank Wilkinson, *The Return of 'Financialized' Liberal Capitalism, in BANKING SYSTEMS IN THE CRISIS - THE FACES OF LIBERAL CAPITALISM* (1st ed. 2012); Andrew Odlyzko, *Financialization of the Early Victorian Economy and the London Stock Exchange*, SSRN (May 31, 2016), available at <https://ssrn.com/abstract=2787154>;

¹⁹⁸⁸ See Philippon & Reshef, *supra* note 1980 at 73-76.

¹⁹⁸⁹ See Konzelmann, Fovargue-Davies, & Wilkinson, *supra* note 1987.

¹⁹⁹⁰ *Id*; see DARON ACEMOGLU, & JAMES A. ROBINSON, *WHY NATIONS FAIL: THE ORIGINS OF POWER, PROSPERITY, AND POVERTY* (1st ed. 2012).

¹⁹⁹¹ See Philippon & Reshef, *supra* note 1980 at 94.

¹⁹⁹² See Konzelmann, Fovargue-Davies, & Wilkinson, *supra* note 1987.

¹⁹⁹³ See Robin Greenwood & David Scharfstein, *The Growth of Finance*, 27(2) JOURNAL OF ECONOMIC PERSPECTIVES 3, 6 (2013).

¹⁹⁹⁴ See *id.* at 4-6.

¹⁹⁹⁵ *Id.*

¹⁹⁹⁶ Apostolos Fasianos, Diego Guevara, & Christos Pierros, *Have We Been Here Before? Phases of Financialization within the 20th Century in the United States*, LEVY ECONOMICS INSTITUTE, WORKING PAPERS SERIES NO. 869 (June 27, 2016), available at <https://ssrn.com/abstract=2801088>.

“transitory phase” continuing until the 1940s; a third “golden age of capital development” taking place until the mid-1970s;¹⁹⁹⁷ 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.¹⁹⁹⁸

Other cited factors include foreign competition resulting in firms shifting investments from “production” activities to “portfolio holdings” for short-term profits;¹⁹⁹⁹ a revolution in “shareholder value” as the dominant ethos of corporate governance;²⁰⁰⁰ the ubiquity of executive pay incentives linked to stock market performance;²⁰⁰¹ 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).²⁰⁰²

Deregulation has also been cited as a causal factor.²⁰⁰³ 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.²⁰⁰⁴ 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*;²⁰⁰⁵ the 1980 enactment of the *Depository Institutions Deregulation and Monetary Control Act*;²⁰⁰⁶ the passage of the *Employment Retirement Income Security Acts of 1974 and 1978* and the *Garn-*

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);

²⁰⁰² *See* Ezra Wasserman Mitchell, *Financialism A (Very) Brief History*, 43 CREIGHTON L. REV. 323, 323327 (2010).

²⁰⁰³ *Id.* at 323.

²⁰⁰⁴ *See* Jihad Dagher, *Regulatory Cycles: Revisiting The Political Economy of Financial Crisis*, INTERNATIONAL MONETARY FUND WORKING PAPER (January 15, 2018), 16-17, <https://www.imf.org/en/Publications/WP/Issues/2018/01/15/Regulatory-Cycles-Revisiting-the-Political-Economy-of-Financial-Crises-45562>.

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).

St. Germain Act of 1982.²⁰⁰⁷ Others studies cite reduced capital controls and greater central bank independence;²⁰⁰⁸ the deregulatory effect of the *Gramm-Leach-Bliley Act of 1999* - eroding the long held separation of commercial and investment banking established in the *Glass-Steagall Act* and fostering the creation of new bank-led financial products.²⁰⁰⁹

Financialization has undoubtedly been influenced by the proliferation of economic theories like the *capital asset pricing model* (“CAPM”),²⁰¹⁰ and the *Black Scholes option pricing theory*,²⁰¹¹ the rise of credit rating agencies and systems for small businesses,²⁰¹² and technological advances facilitating investment decision making “detached” from considerations of underlying business ownership.²⁰¹³ Also, market liquidity expansions (and more exchanges),²⁰¹⁴ and the dismantling of Bretton Woods have been cited in the academic literature as contributing.²⁰¹⁵ 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.²⁰¹⁶ Also contributing are developments in information technology and computer processing speeds, including the use of algorithmic and “high frequency” trading;²⁰¹⁷ corporate takeover activity (driven in part by anti-trust relaxations in the 1980s) with executive pay tied to stock performance.²⁰¹⁸

²⁰⁰⁷ See Rosemary Batt & Eileen Appelbaum, *The Impact of Financialization on Management and Employment Outcomes*, UPJOHN INSTITUTE WORKING PAPER NO. 13-191, 9 (February 28, 2013), available at <https://ssrn.com/abstract=2235748>.

²⁰⁰⁸ See S. Polillo & Mauro F. Guillén, *Globalization pressures and the state: The worldwide spread of central bank independence*, 110 AMERICAN JOURNAL OF SOCIOLOGY 1764, 1764-1802 (2005).

²⁰⁰⁹ See Mitchell, *supra* note 2002 at 331.

²⁰¹⁰ See generally John Lintner, *Security Prices, Risk, and Maximal Gains from Diversification* 20 J. FIN. 587 (1965); Franco Modigliani and Gerald A. Pogue, *An Introduction to Risk and Return: Concepts and Evidence*, 30 FIN. ANAL. J. 68 (1974); William Sharpe, *Capital Asset Prices: A Theory of Market Equilibrium Under Conditions of Risk*, 19 J. FIN. 425 (1964).

²⁰¹¹ See Fischer Black & Myron Scholes, *The Pricing of Options and Corporate Liabilities*, 81 J. POL. ECON. 637 (1973).

²⁰¹² See A. Rona-Tas & S. Hiss, *The Role of Ratings in the Subprime Mortgage Crisis: The Art of Corporate and the Science of Consumer Credit Rating*, 30 RESEARCH IN THE SOCIOLOGY OF ORGANIZATIONS 115, 115-155 (2010).

²⁰¹³ See Mitchell, *supra* note 2002 at 323.

²⁰¹⁴ Palley, *supra* note 1984 at 5.

²⁰¹⁵ See Paddy Ireland, *Financialization and Corporate Governance*, CORPORATE GOVERNANCE AND GLOBALIZATION COLLOQUIUM, 19 (September 2008), available at <https://ssrn.com/abstract=2068478>.

²⁰¹⁶ See Dagher, *supra* note 2004 at 39.

²⁰¹⁷ See Wendy L. Currie, & Thomas Lagoarde-Segot, *Financialization and Information Technology: Themes, Issues and Critical Debates – Part I*, 32(3) JOURNAL OF INFORMATION TECHNOLOGY 211 (2017).

²⁰¹⁸ Gerald F. Davis & Suntae Kim, *Financialization of the Economy*, 41 ANNUAL REVIEW OF SOCIOLOGY 203, 216 (2015).

Individually there is now more fund and direct share ownership than ever before,²⁰¹⁹ with higher individual debt levels and more access to credit.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.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.²⁰²²

Financialization has many significant societal and economic implications. Some scholars cite its association with the “collapse” of the middle class,²⁰²³ an increase in speculative trading,²⁰²⁴ the proliferation of leverage and debt,²⁰²⁵ the propagation of “too-big-to-fail” financial institutions,²⁰²⁶ a decline in productivity growth,²⁰²⁷ political volatility and class-based cultural warfare,²⁰²⁸ “warped” societal values,²⁰²⁹ manufacturing outsourcing and

²⁰¹⁹ *Id.*

²⁰²⁰ See L. Hyman, *Debtor Nation: How Consumer Credit Built Postwar America*, 9 ENTERPRISE AND SOCIETY 614, 614-18 (2008).

²⁰²¹ See J.S. Hacker, *Privatizing Risk Without Privatizing The Welfare State: The Hidden Politics of Social Policy Retrenchment in the United States*, 98 AMERICAN POLITICAL SCIENCE REVIEW 243, 243-260 (2004); see Gerald F. Davis, *A New Finance Capitalism? Mutual funds and Ownership Re-Concentration in the United States*, 5 EUROPEAN MANAGEMENT REVIEW 11, 11-21 (2008).

²⁰²² Davis & Kim, *supra* note 2018 at 204.

²⁰²³ See generally Les Leopold, *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.

²⁰²⁴ See COMPLEXITY LABS, *Financialization*, <https://complexitylabs.io/Blog/financialization-explained/>.

²⁰²⁵ See generally Peter Isackson, *The Daily Devil's Dictionary: Economy Will “Crash”*, FAIR OBSERVER (July 5, 2018), https://www.fairobserver.com/region/north_america/jim-rogers-economic-collapse-crash-world-news-this-week/.

²⁰²⁶ See generally James Lardner, *Are we repeating history by letting our financial sector get too big?* THE WASHINGTON POST (April 20, 2016), https://www.washingtonpost.com/news/in-theory/wp/2016/04/20/are-we-repeating-history-by-letting-our-financial-sector-grow-too-large/?utm_term=.cd3c9e534f25.

²⁰²⁷ See Owen Woolcock, *Is Finance An Unproductive Industry*, FINANCIAL TIMES (February 6, 2015), <https://www.ft.com/content/c8c98627-4992-361b-916f-6a2b4fd4e776>.

²⁰²⁸ See generally Aaron Bobrow-Strain, *The Rise and Fall of White Bread*, SALON (March 3, 2012), https://www.salon.com/2012/03/03/the_rise_and_fall_of_white_bread/.

²⁰²⁹ See Michael Konczal, *How The Rise of Finance Has Warped Our Values*, THE WASHINGTON POST (April 22, 2016), https://www.washingtonpost.com/news/in-theory/wp/2016/04/22/how-the-rise-of-finance-has-warped-our-values/?utm_term=.31dc3c6c45e0.

income inequality,²⁰³⁰ lower rates of entrepreneurialism,²⁰³¹ and declining manufacturing, industrial investment,²⁰³² and productive enterprise.²⁰³³ These negative sentiments lead one to recall Karl Polanyi's famous "transformation" assessment of markets – that they first are "embedded in social relations"²⁰³⁴ and then they evolve to later capture all of society which becomes merely "an accessory to the economic system."²⁰³⁵ Financialization has also been criticized as "money for nothing"²⁰³⁶ and associated with a form of unproductive economic "rent seeking."²⁰³⁷

Some even go as far as calling it "unproductive finance" and a cause of societal income inequality.²⁰³⁸ 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.²⁰³⁹ Lord Adair Turner, former head of the United Kingdom's *Financial Services Authority*,²⁰⁴⁰ has stated that many modern financial market activities are "economically useless"²⁰⁴¹ and laments banks

²⁰³⁰ See Davis & Kim, *supra* note 2018.

²⁰³¹ See Stacey Higginbotham, *Are Crappy Start-ups Wall Street's Fault?* GIGAOM (March 24, 2011), <https://gigaom.com/2011/03/24/are-crappy-startups-wall-streets-fault/>.

²⁰³² See generally Michael Collins, *The Financialization of the Economy Hurts Manufacturing*, INDUSTRY WEEK (September 25, 2015), <https://www.industryweek.com/competitiveness/financialization-economy-hurts-manufacturing>.

²⁰³³ See CEDRIC DURAND, *FICTITIOUS CAPITAL, HOW FINANCE IS APPROPRIATING OUR FUTURE* (2014).

²⁰³⁴ KARL POLANYI, *THE GREAT TRANSFORMATION*, 57 (1st ed. 1957).

²⁰³⁵ *Id.* at 75.

²⁰³⁶ See Paul Krugman, *Money For Nothing*, THE NEW YORK TIMES (April 29, 2009), <https://www.nytimes.com/2009/04/27/opinion/27krugman.html>

²⁰³⁷ See Thomas Philippon, *Brief: Finance, Productivity, and Distribution*, BROOKINGS INSTITUTE GLOBAL ECONOMY AND DEVELOPMENT (October 2016), <https://www.brookings.edu/wp-content/uploads/2018/01/philippon-october-2016.pdf>; Jeremy Kidd, *Fintech: Antidote To Rent-Seeking?* 93 CHI. KENT L. REV. 165, 170 (2018).

²⁰³⁸ Rana Foroohar, *The Economy's Greatest Illness: The Rise of Unproductive Finance*, EVONOMICS (15 November 2016), <http://evonomics.com/financialization-hidden-illness-rana-foorohar/>.

²⁰³⁹ See Bruce Bartlett, *'Financialization' as a Cause of Economic Malaise*, THE NEW YORK TIMES (June 11, 2013), <https://economix.blogs.nytimes.com/2013/06/11/financialization-as-a-cause-of-economic-malaise/>.

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).²⁰⁴² Financialization may also be related to speculation-driven asset price bubbles²⁰⁴³ 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.”²⁰⁴⁴ Other studies suggest that certain types of financial product innovations have increased volatility (through “interaction” effects and “flash crashes”)²⁰⁴⁵ – a contention supported by numerous findings in this dissertation. A wide array of studies also links financialization to income inequality,²⁰⁴⁶ and as negatively impacting employment.²⁰⁴⁷

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;²⁰⁴⁸ enhanced liquidity, price discovery, credit expansion, global interaction, information transmission and utilization;²⁰⁴⁹ and the potential for finance to positively engineer social change and facilitate socially responsible investing.²⁰⁵⁰ The continuing expansion of finance has arguably made markets more efficient in many ways.²⁰⁵¹ Increased trading can lead to stabilizing activity when prices deviate from efficient levels, and it also enhances

²⁰⁴² See Tom Clark, *Between Debt and the Devil by Adair Turner Review – Should The Government Start Printing Money?* THE GUARDIAN (November 25, 2015), <https://www.theguardian.com/books/2015/nov/25/between-debt-and-devil-adair-turner-review>.

²⁰⁴³ See generally Ehsan Ahmed et al., *Financialization and Speculative Bubbles - International Evidence*, CAMA WORKING PAPER NO. 6/2017, 6 (December 12, 2016), available at <https://ssrn.com/abstract=2899960>; see C.P. KINDLEBERGER, MANIAS, PANICS, AND CRASHES (4th ed. 2000); ROBERT J. SHILLER, IRRATIONAL EXUBERANCE (3rd ed. 2015); Hyman P. Minsky, *Financial Instability Revisited: The Economics of Disaster*, REAPPRAISAL OF THE FEDERAL RESERVE DISCOUNT MECHANISM 3, 97-136 (1972).

²⁰⁴⁴ Palley, *supra* note 1984 at 20.

²⁰⁴⁵ 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/>.

²⁰⁴⁶ See INTERNATIONAL LABOUR ORGANIZATION, *Global Wage Report 2012/13: Wages and equitable growth*, Geneva, International Labour Office, 2013; N.van der Zwan, *Making sense of financialization*. 12 SOCIO-ECONOMIC REVIEW 99 (2014); Basak Kus, *Financialization and Income Inequality in OECD Nations: 1995-2007*, 43(4) THE ECONOMIC AND SOCIAL REVIEW 477, 492 (2012).

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.

²⁰⁴⁹ See WILLIAM N. GOETZMANN, *MONEY CHANGES EVERYTHING: HOW FINANCE MADE CIVILIZATION POSSIBLE* (1st ed. 2017).

²⁰⁵⁰ See generally ANDREW LO, *ADAPTIVE MARKETS: FINANCIAL EVOLUTION AT THE SPEED OF THOUGHT* (1st ed. 2017).

²⁰⁵¹ Palley, *supra* note 1984 at 4.

market liquidity.²⁰⁵² The IMF has associated “financial development” with positive byproducts like “growth”, “resilience”, “diversification and management of risk” and “resource allocation.”²⁰⁵³ However, the IMF also acknowledges that there may be “limits”²⁰⁵⁴ to the benefits of financialization and that “financial deepening” in mature markets can negatively impact productivity growth.²⁰⁵⁵ 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.²⁰⁵⁶

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.²⁰⁵⁷ 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.”²⁰⁵⁸ It may also foster economic growth.²⁰⁵⁹ Additionally it can facilitate “information transmission, risk sharing, and allocation of capital” as well as increase the quality of financial products and services.²⁰⁶⁰

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.

²⁰⁵² See generally Milton Friedman, *The Case for Flexible Exchange Rates*, in ESSAYS IN POSITIVE ECONOMICS (1st ed. 1953).

²⁰⁵³ See Ratna Sahay et al. *Rethinking Financial Deepening: Stability and Growth in Emerging Markets*, IMF STAFF DISCUSSION NOTE, 5-6 (May 2015).

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.*

²⁰⁵⁹ See generally, Ross Levine. *Finance and Growth: Theory and Evidence*, IN HANDBOOK OF ECONOMIC GROWTH VOL. 1A, PP. 865–934 (P. AGHION, & S. N. DURLAUF ED. 2005); see also Peter L. Rousseau, & Richard Sylla, *Financial Systems, Economic Growth, and Globalization*, Chapter 13 in GLOBALIZATION IN HISTORICAL PERSPECTIVE (M. D. BORDO, A. M. TAYLOR, & J. G. WILLIAMSON ED. 2003).

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

²⁰⁶¹ See Chris Flood, *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>; see Itzak Ben-David, Francesco Franzoni, Rabih Moussawi, John Sedunov, *The Granular Nature of Large Institutional Investors*, NBER WORKING PAPERS NO. 22247 (July 2020), <https://www.nber.org/papers/w22247>.

²⁰⁶² See L. Randall Wray, *Minsky’s Money Manager Capitalism and the Global Financial Crisis*, Working Paper 661, LEVY ECONOMICS INSTITUTE OF BARD COLLEGE (1996); Hyman Minsky, *Uncertainty and the Institutional Structure of Capitalist Economies*, Working Paper 155, LEVY ECONOMICS INSTITUTE OF BARD COLLEGE (1996); Hyman P. Minsky, *Money Manager Capitalism*, HYMAN P. MINSKY ARCHIVE. Paper 13 (1989),

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,²⁰⁶³ also cautioned against the destabilizing impact that asset managers could levy on the financial system.²⁰⁶⁴ 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.²⁰⁶⁵

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*).

http://digitalcommons.bard.edu/hm_archive/13; C.J. Whalen, C.J. (2002), *Money manager capitalism: Still here, but not quite as expected*, 36(2) J. OF ECON. ISSUES (2002).

²⁰⁶³ See Minsky, Hyman P. *The Financial Instability Hypothesis*, LEVY ECONOMICS INSTITUTE OF BARD COLLEGE WORKING PAPER NO. 74 (May 1992); Minsky, H.P. *Financial instability revisited: The economics of disaster*. 3 REAPPRAISAL OF THE FEDERAL RESERVE DISCOUNT MECHANISM 97 (1972).

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.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.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.

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>.

²⁰⁶⁷ See ARTHUR E. WILMARTH, JR. TAMING THE MEGABANKS (FORTHCOMING 2020, OXFORD UNIVERSITY PRESS).

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