

Fisch, Jill E.; Wilkinson-Ryan, Tess

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Why do retail investors make costly mistakes? An experiment on mutual fund choice

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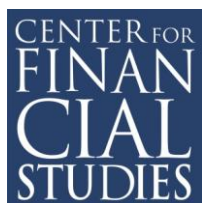
CFS WORKING PAPER

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An Experiment on Mutual Fund Choice**

Jill E. Fisch, Tess Wilkinson-Ryan





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WHY DO RETAIL INVESTORS MAKE COSTLY MISTAKES? AN EXPERIMENT ON MUTUAL FUND CHOICE

Jill E. Fisch^{*}

Tess Wilkinson-Ryan^{**}

Abstract

There is mounting evidence that retail investors make predictable, costly investment mistakes, including underinvestment, naïve diversification, and payment of excessive fund fees. Over the past thirty-five years, however, participant-directed 401(k) plans have largely replaced professionally managed pension plans, requiring unsophisticated retail investors to navigate the financial markets themselves. Policy-makers have struggled with regulatory interventions designed to improve the quality of investment decisions without a clear understanding of the reasons for investor mistakes. Absent such an understanding, it is difficult to design effective regulatory responses.

This article offers a first step in understanding the investor decision-making process. We use an internet-based experiment to disentangle possible explanations for inefficient investment decisions. The experiment employs a simplified construct of an employee's allocation among the options in a retirement plan coupled with technology that enables us to collect data on the specific information that investors choose to view. In addition to collecting general information about the process by which investors choose among mutual fund options, we employ an experimental manipulation to test the effect of an instruction on the importance of mutual fund fees. Pairing this instruction with simplified fee disclosure allows us to distinguish

^{*} Perry Golkin Professor of Law, University of Pennsylvania Law School.

^{**} Assistant Professor of Law, University of Pennsylvania Law School. We are grateful for helpful comments from William Bratton, Wei Jiang, Chris Sanchirico, Jonathan Klick, Michael Knoll and the participants at the 2013 Penn/NYU Conference on Law and Finance, the University of Pennsylvania Law School's Ad Hoc faculty seminar, the ETH Zurich Law & Finance Workshop and Lecture Series, the University of Minnesota Faculty Works in Progress workshop. Bonnie White, Penn Law Class of 2013, and Liann Sun, University of Pennsylvania Class of 2013, provided excellent research assistance.

between motivation-limits and cognition-limits as explanations for the widespread findings that investors ignore fees in their investment decisions.

Our results offer partial but limited grounds for optimism. On the one hand, within our simplified experimental construct, our subjects allocated more money, on average, to higher-value funds. Furthermore, subjects who received the fees instruction paid closer attention to mutual fund fees and allocated their investments into funds with lower fees. On the other hand, the effects of even a blunt fees instruction were limited, and investors were unable to identify and avoid clearly inferior fund options. In addition, our results suggest that excessive, naïve diversification strategies are driving many investment decisions. Although our findings are preliminary, they suggest valuable avenues for future research and important implications for regulation of retail investing.

INTRODUCTION

There is mounting evidence that retail investors make predictable, costly mistakes.¹ They save too little; they trade too frequently; they buy high and sell low; they invest in fad instruments they do not understand; and they pay excessive fees. In an August 2012, 200-page study prepared in response to a Dodd-Frank mandate, the SEC concluded that “American investors lack basic financial literacy.”² The study found that investors do not understand basic concepts such as diversification, investment costs, inflation and compound interest, and that they lack the knowledge necessary to protect themselves from fraud.

Despite investors’ seemingly limited competence, regulatory and market developments increasingly require retail investors to navigate the financial markets themselves. Over the past thirty-five years, participant-directed 401(k) plans have largely replaced professionally managed pension plans.³ Unlike traditional pension plans, participant-directed

¹ See, e.g., Andrea Frazzini & Owen Lamont, *Dumb Money: Mutual Fund Flows and the Cross-Section of Stock Returns*, 88 J. FIN. ECON. 299 (2008) (concluding that “individual investors have a striking ability to do the wrong thing.”).

² SECURITIES & EXCHANGE COMM’N, SEC STAFF STUDY REGARDING FINANCIAL LITERACY AMONG INVESTORS, 15 (2012) (*hereinafter* “SEC STAFF STUDY”).

³ See Pamela Perun & Joseph John Valenti, *Defined Benefit Plans: Going, Going, Gone?* 4 (2008), available at planetnow.com/metaPage/lib/Perun-ValentiFinalAppam.pdf (observing that “[i]n 1975, over 70% of active employees

401(k) plans place the responsibility for critical investment decisions in the hands of employees, who are responsible for selecting their own investments from a menu of employer-provided alternatives. This means that low-level employees—individuals with even less investment knowledge than the general population⁴—are now investing for retirement with almost no guidance.

To complicate matters further, mutual funds are the dominant investment option provided by employer-sponsored 401(k) plans, and the primary way in which retail investors participate in the stock market both in- and outside of retirement plans.⁵ Unlike other equity investments, notably stock, mutual funds are held primarily by individual investors.⁶ This market segmentation means that retail fund investors cannot benefit from market discipline effected by more sophisticated institutions.⁷

As a result, there are reasons to doubt the efficiency of the mutual fund market: specifically, whether the market offers retail investors reasonable and comprehensible investment options. In particular, many commentators are puzzled by the huge number of fund choices and by the persistence of high-fee funds that underperform the market.⁸

Congress, the Securities and Exchange Commission (SEC), the Department of Labor and the courts have struggled with the possibility that market forces are insufficient to protect retail investors from making poor investment decisions. Regulatory responses designed to protect

participated in a defined benefit plan. In 2005, the majority of active employees (over 75%) participated in a defined contribution plan instead.”)

⁴ SEC STAFF STUDY, *supra* note 2, at 15.

⁵ See INVESTMENT COMPANY INSTITUTE, 2012 INVESTMENT COMPANY FACT BOOK (2012), at 90, (*hereinafter* “ICI FACT BOOK”) (stating that 91% of mutual fund holding households hold mutual fund shares inside retirement plans).

⁶ See *id.* at 86 (explaining that households owned 89% of mutual fund assets as of the end of 2011). Institutional use of mutual funds is limited and consists mostly of money market funds, which are used for cash management. See *Id.*

⁷ Some mutual funds operate multiple versions that are sold to retail and institutional investors. Although institutional “twins” typically charge lower fees than retail funds, one study finds that retail funds with an institutional twin perform better, suggesting that, in this context, retail investors can benefit from the market discipline imposed by institutions. See Richard B. Evans & Rüdiger Fahlenbrach, *Institutional Investors and Mutual Fund Governance: Evidence from Retail–Institutional Fund Twins*, 25 REV. FIN. STUD. 3530 (2012).

⁸ See, e.g., Peter J. Walliston & Robert E. Litan, *COMPETITIVE EQUITY* (2007), 8-9 (observing that the mutual fund industry does not appear to conform to the “law of one price”).

investors include mandated disclosure requirements, product limits, and the imposition of fiduciary duties on employers, brokers and investment advisors. Widespread litigation over the role of judicial oversight of mutual fund fees and the scope of employer obligations in designing a retirement plan raises questions about the manner in which individuals make investment decisions. In one such high profile case, Seventh Circuit Judges Posner and Easterbrook, although reaching opposite conclusions about investor behavior, noted that the manner in which such decisions are made is critical to evaluating the appropriate level of regulatory intervention.⁹

The importance of understanding investor behavior is not limited to the litigation context. With the increasing dependence of employees on their 401(k) plans to deliver retirement income, employers are rethinking issues such as plan structure and the choice of investment options.¹⁰ BrightScope's highly-publicized on-line ratings and rankings of 401(k) plans have heightened employer attention to the importance of plan design.¹¹

Congress acknowledged the need for a better understanding of investor behavior in the Dodd–Frank Wall Street Reform and Consumer Protection Act (“Dodd-Frank”).¹² Specifically, in Dodd-Frank, Congress

⁹ Compare *Jones v. Harris Assocs.*, 527 F.3d 627, 631 (7th Cir. 2008) (reasoning that market discipline should constrain excessive mutual fund fees by driving investors away from costly funds); *Jones v. Harris Assocs.*, 537 F.3d 728, 732 (7th Cir. 2008) (Posner, J., dissenting from denial of rehearing en banc), denying reh'g to 527 F.3d 627 (7th Cir. 2008) (questioning whether high fees actually drive investors away). The United States Supreme Court vacated the Seventh Circuit decision without resolving the question. See *Jones v. Harris Assocs. L.P.*, 130 S. Ct. 1418, 1430-1431 (2010) (“The debate between the Seventh Circuit panel and the dissent from the denial of rehearing regarding today's mutual fund market is a matter for Congress, not the courts.”).

¹⁰ See, e.g., AON HEWITT, 2011 TRENDS & EXPERIENCE IN DEFINED CONTRIBUTION PLANS, ASSOCIATES, TRENDS AND EXPERIENCE IN 401(K) PLANS (2009), (explaining emerging trends in plan design and administration).

¹¹ See, e.g., YOUR 401(K) PLAN'S ONLINE REPORT CARD — AND WHAT TO DO ABOUT IT, E IS FOR ERISA, Oct. 5, 2011, <http://eforerisa.wordpress.com/2011/10/05/your-401k-plans-online-report-card-and-what-to-do-about-it/> (providing advice to employers on addressing a low BrightScope rating); Ron Lieber, *Spotlighting 401(k) Plans, Thanklessly*, N.Y. TIMES, Sept. 18, 2011, (describing attention received by BrightScope ratings and criticisms of its methodology).

¹² Dodd–Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203, 124 Stat. 1376 (2010) (codified as amended at 15 U.S.C. § 78n(a)(2) (Supp. IV 2010) (*hereinafter* “Dodd-Frank Act”).

instructed the SEC to conduct a study of investor financial literacy.¹³ The SEC's study was conducted at the most superficial level, however, and produced limited insight into developing future regulatory policy.¹⁴ Although the SEC identified investor mistakes and misconceptions, it did not seek to identify the reasons for these mistakes or to understand the underlying mechanisms driving investor choices.

This article takes up where the SEC study left off. We report the results of an experiment designed to explore how investors use the information provided to them, and why they often ignore it. Using a simulated investment game in which participants were asked to allocate funds in a retirement account among ten mutual fund alternatives, we offer some insights into how individuals seek and assimilate information about a fund's characteristics. In particular, our experiment offers a novel addition to the body of experimental evidence on investor decision-making by incorporating a technology that allows us to collect data on the specific information that investors choose to view.

In addition to collecting general information about the process by which investors choose among mutual fund options, we employ an experimental manipulation to test the effect of an instruction on the importance of mutual fund fees. Pairing this instruction with simplified fee disclosure allows us to distinguish between motivation-limits and cognition-limits as explanations for the widespread findings that investors ignore fees in their investment decisions.

Our results offer partial but limited grounds for optimism. On the one hand, within our simplified experimental construct, our subjects allocated more money, on average, to higher-value funds. Furthermore, subjects who received the fees instruction paid closer attention to mutual fund fees and allocated their investments into funds with lower fees. On the other hand, the effects of even a blunt fee instruction were limited, and investors were unable to identify and avoid clearly inferior fund options. In addition, our results suggest excessive, naïve diversification strategies are driving many investment decisions.

Our findings are concededly preliminary. More importantly, because of the simplified nature of our experiment, extension of our results to real world investment decisions, in which the stakes and the

¹³ Id. at § 917.

¹⁴ SEC STAFF STUDY, *supra* note 2.

cost of gathering and evaluating investment information are much higher, is unclear. Nonetheless, our research offers a starting point in terms of both understanding investor behavior and evaluating efforts to improve the quality of investor decisions. In particular, determining whether effective investor education is possible is critical to evaluating the manner in which we regulate, structure, and evaluate retail investing options such as retirement plans.

The article is organized as follows. Part I briefly describes the regulatory environment for mutual funds and 401(k) retirement plans. Part II identifies key findings on retail investor decision-making and observes how these findings cast doubt on the effectiveness of market discipline in the mutual fund market. Part III describes our experiment structure. Part IV reports our results. Part V explores the implications of our findings and identifies next steps for additional research.

I. THE REGULATORY ENVIRONMENT FOR MUTUAL FUNDS AND 401(K) PLANS

A. *Mutual Funds*

Mutual funds are the dominant investment vehicle for retail investors.¹⁵ A mutual fund is a pool of assets that may include stocks, bonds, and other investment products. A mutual fund investor purchases shares that represent a pro rata ownership interest in the fund's pool of assets. The fund is required to value its assets on a daily basis and to purchase and sell fund shares at their net asset value, or "NAV."¹⁶

At the end of 2011, there were over 7,637 active mutual funds in the United States.¹⁷ Mutual funds are typically categorized according to the type of assets in which they invest. These include funds that invest primarily in equity, funds that confine themselves to fixed income investments, and hybrid funds that combine the two. Funds may be

¹⁵ The economic importance of mutual funds worldwide is even greater. The Investment Company Institute reported that there were 72, 657 mutual funds worldwide, holding almost \$24 trillion in assets at the end of 2011. ICI FACT BOOK, *supra* note 5, at 193.

¹⁶ For a general description of mutual funds, see Jill E. Fisch, *Rethinking the Regulation of Securities Intermediaries*, 158 U. PENN. L. REV. 1961 (2012).

¹⁷ ICI FACT BOOK, *supra* note 5, at 134 table 1. In addition to funds, there were over 1100 exchange traded funds or ETFs as of the end of 2011. *Id.* at 147 Table 14. ETFs differ from mutual funds in several key features, including the manner in which they trade, but offer investors a similar type of diversified investment. See Fisch, *supra* note 16 (describing ETFs).

actively managed or seek to replicate the performance of an index such as the S&P 500. Some funds focus on a particular segment of the market such as energy stocks or pharmaceuticals, others in specific asset classes such as large cap equities or junk bonds. International funds purchase assets from across the globe or within a specific foreign country or geographic region. Target date funds offer a shifting mix of equities and fixed income assets that becomes more conservative as the specified target date approaches.¹⁸

Mutual funds do not typically hire employees to make investment decisions or perform administrative services.¹⁹ Instead, funds outsource all operational requirements to outside service providers. The funds pass on the costs of these services to the funds' shareholders in the form of various fees. Funds' fees can include sales fees (also known as "loads"), management fees, distribution (12b-1) fees, and administrative expenses.²⁰ Of these fees, the largest are management fees, which are paid to the funds' investment advisors. In addition to these fees, a fund may have less transparent expenses, such as trading commissions. The cost of commissions is not included in the funds' tables of fees, but is also borne by the funds' shareholders.²¹ The complexity of fund fee structures makes it difficult to calculate costs or compare different funds.²²

As of 2011, forty-four percent of U.S. households, or 52.3 million households, owned mutual funds.²³ Mutual fund investing is not limited to wealthy or sophisticated retail investors; most mutual fund-

¹⁸ Target date funds are often used for retirement investing. See Fisch, *supra* note 16 at 2022-23 (explaining target date funds).

¹⁹ See, e.g., William A. Birdthistle, *Compensating Power: An Analysis of Rents and Rewards in the Mutual Fund Industry*, 80 TUL. L. REV. 1401, 1409 (2006) (explaining that "the typical mutual fund is a rudimentary legal vessel [which] has no offices, no equipment and no employees.").

²⁰ See SECURITIES & EXCHANGE COMM'N, MUTUAL FUND FEES AND EXPENSES (2007) (describing various types of mutual fund fees and expenses).

²¹ See Fisch, *supra* note 16 at 1996-98 (explaining economic importance of trading commissions).

²² As one commentator observes, the complexity of fee structures may allow mutual funds to resist competitive pressure by preventing retail investors from understanding fund pricing. Bruce I. Carlin, *Strategic Price Complexity in Retail Financial Markets*, 91 J. FIN. ECON. 278 (2009).

²³ *Id.* at 86. Mutual fund ownership has increased dramatically over the past thirty years. In 1980, less than six percent of US households owned mutual funds. *Id.* at 85.

owning households had household incomes of less than \$100,000.²⁴ The relative lack of sophistication among mutual fund investors has led Congress and the Securities and Exchange Commission to regulate mutual funds strictly.

The SEC oversees the operation of mutual funds, which are heavily regulated by the Investment Company Act of 1940, or the “ICA.”²⁵ Among the regulations imposed on mutual funds are extensive disclosure regulations, including disclosure of a fund’s investment objectives, costs, investment strategies, and advisers. Funds are restricted in their investments, in their use of leverage, and in the manner in which they compensate their investment advisers.²⁶ The ICA also requires mutual funds to have a board consisting of directors of whom at least 40% must be independent of the fund’s investment advisor.²⁷ Finally, the ICA requires the funds’ shareholders to elect the directors and to approve certain structural changes.²⁸

The extensive regulation of mutual funds is a direct response to concerns about investor exploitation and the inability of market forces to adequately protect investors. Investors in mutual funds lost 40% of their investments between 1929 and 1936.²⁹ Congress found, relying on an SEC study, that mutual fund sponsors were acting largely out of self-interest, abandoning their fiduciary duties to investors and charging investors with unjustified costs and expenses.³⁰ The ICA was Congress’ response to that problem.

However, the problem of mutual funds charging excessive fees continued. In 1966, the SEC reported to Congress that neither the ICA nor market discipline provided mutual fund investors with sufficient

²⁴ *Id.* at 88. Only 38% of mutual fund owning households had incomes over \$100,000, and the median income for mutual fund holding households was \$80,000. *Id.*

²⁵ 15 U.S.C. §§ 80a-1 to -64 (2006).

²⁶ Fisch, *supra* note 16 at 1170-71.

²⁷ SEC rules set a higher threshold, requiring fund boards to have a majority of independent directors in order for the fund to qualify for certain exemptive rules. *See* Role of Independent Directors of Investment Companies, Securities Act Release No. 7932, Exchange Act Release No. 43,786, Investment Company Act Release No. 24,816, 66 Fed. Reg. 3734, 3736 (Jan. 16, 2001) (codified as amended at scattered parts of 17 C.F.R.).

²⁸ Unlike operating companies, mutual funds need not provide annual meetings for the election of directors.

²⁹ Paul Roye, *Speech by SEC Staff: A Celebration of the 60th Anniversary of the Investment Company Act* (Oct. 4, 2000).

³⁰ *Id.*

protection against excessive costs.³¹ The SEC noted that the problem was exacerbated by the fact that mutual funds were sold primarily to “family [men] of moderate income.”³² In response, the SEC recommended that the ICA be amended to limit investment advisors to a “reasonable” fee for their management services and “that this standard be enforceable in the courts.”³³

Congress adopted the SEC’s recommendation and included in the 1970 revisions to the ICA Section 36(b), which imposes a fiduciary duty upon investment advisers with respect to compensation received from a mutual fund and provides investors with a private right of action to enforce this duty.³⁴ Today, fees are far lower than they were in the 1960s, and, according to the Investment Company Institute, most new investments are made in funds that charge lower fees.³⁵ Nonetheless, mutual fund fees continue to vary significantly. Morningstar reports that currently the average reported expense ratio for U.S. large cap equity mutual funds is 1.31%,³⁶ but fees range from .05%³⁷ to more than 2%.³⁸

³¹ SECURITIES AND EXCHANGE COMM’N, REPORT ON THE PUBLIC POLICY IMPLICATIONS OF INVESTMENT COMPANY GROWTH TO HOUSE COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE (1966) (*hereinafter* 1966 SEC REPORT). The report concludes that “mutual fund shareholders need protection against incurring excessive costs in the acquisition and management of thew [sic] investments and that, given the structure and incentives prevailing in the industry, neither competition nor the few elementary safeguards against conflict of interest deemed sufficient in 1940 and contained in the Investment Company Act presently provide this protection in adequate measure.” *Id.* at viii.

³² 1966 SEC Report, *supra* note, at ix.

³³ *Id.* at viii.

³⁴ 15 U.S.C. 80a-36(b), Pub. L. No. 91-547, 84 Stat. 1413 (1970) (codified as amended in scattered sections of 15 U.S.C.). *See* Jones v. Harris Assocs. L.P., 130 S. Ct. 1418, 1423 (2010).

³⁵ ICIFACT BOOK, *supra* note 5 at 71-72.

³⁶ FINRA, Fund Analyzer Additional Information, *available at* <http://www.finra.org/Investors/ToolsCalculators/P117437> (last visited Sept. 19, 2012).

³⁷ Fidelity’s Spartan S&P 500 index fund currently has an expense ratio of .05% for investors investing over \$10,000. *See* Fidelity.com, Spartan 500 Index Fund - Investor Class, Expense ratio, *available at* <http://fundresearch.fidelity.com/mutual-funds/summary/315911206> (last visited February 15, 2013).

³⁸ Alliance Bernstein’s Blended Style Funds Tax-Managed International Portfolio, for example, has an expense ratio of 2.02%. *See* Alliance Bernstein Website, AllianceBernstein Blended Style Funds Tax-Managed International Portfolio, Performance, https://www.alliancebernstein.com/abcom/Product_Center/3_Vehicle/MF/Equity/Core/Tax-Mgd_International_Portfolio.htm?shareclass=A (last visited Nov. 20, 2012).

Although one might imagine that competitive markets would make it difficult for investors to raise legal challenges to fees they voluntarily elected to pay, suits against mutual fund advisers alleging excessive fees are surprisingly common.³⁹ To date, no court has ever held an advisor liable in so-called “§36(b)” litigation,⁴⁰ but one commentator estimates that the defense and settlement of these lawsuits costs the mutual fund industry \$400 million per year.⁴¹ To a certain extent, this litigation pits the legal standard of fiduciary obligation against the effectiveness of market discipline.

This tension was recently exposed in the Seventh Circuit opinions in *Jones v. Harris*.⁴² The panel majority in *Jones* viewed extensive judicial oversight over fee levels as inappropriate, reasoning that “investors can and do protect their interests by shopping, and that regulating advisory fees through litigation is unlikely to do more good than harm.”⁴³ Critical to the court’s analysis was an assessment of the role of investor decisions in constraining fees. As Judge Posner observed in his dissent from denial of the petition for rehearing en banc, the court’s reasoning raised an important empirical question: “will high fees drive investors away?”⁴⁴

The Supreme Court in *Jones*⁴⁵ did not resolve what one commentator terms “the sharp disagreement between two leading market-oriented jurists” about the operation of the market for mutual funds.⁴⁶ Empirical studies have begun to try to answer this question, and the study we report in Part III adds to that growing literature.⁴⁷

³⁹ Todd Henderson finds that more than 100 lawsuits have been filed since 1970 when the Investment Company Act was amended to provide a private right of action under §36(b). Todd Henderson, *Justifying Jones*, 77 U. CHI. L. REV. 1027 1033 (2010); Quinn Curtis and John Morley report that investors filed 91 suits against mutual fund advisers alleging excessive fees between 2000 and 2009. Quinn Curtis & John D. Morley, *An Empirical Study of Mutual Fund Excessive Fee Litigation: Do the Merits Matter?* J. L. ECON. & ORG. (forthcoming, 2013).

⁴⁰ Henderson, *supra* note __ at 1033.

⁴¹ *Id.* at 1043.

⁴² *Jones v. Harris Assocs. L.P.*, 527 F.3d 627 (7th Cir. Ill. 2008) (Easterbrook J.).

⁴³ *Id.* at 634.

⁴⁴ *Jones v. Harris Assocs.*, 537 F.3d 728, 732 (7th Cir. 2008) (Posner, J., dissenting).

⁴⁵ *Jones v. Harris Assocs. L.P.*, 130 S. Ct. 1418, 1430-1431 (2010).

⁴⁶ See Larry E. Ribstein, *Federal Misgovernance of Mutual Funds*, 2009-10 CATO SUP. CT. REV. 301, 316 (describing the *Jones* decision).

⁴⁷ The Supreme Court did not attempt to resolve this question. See *Jones v. Harris Assocs. L.P.*, 130 S. Ct. 1418, 1430-1431 (2010) (“The debate between the Seventh

B. 401(k) Plans

Courts and policy-makers are increasingly concerned with mutual fund investment decision-making, because mutual funds are the primary vehicle for employee retirement savings. Over the past forty years, employee retirement savings plans have largely shifted from defined benefit pension plans⁴⁸ to defined contribution plans, primarily 401(k) plans.⁴⁹ Both types of plans are regulated by the Employee Retirement Income Security Act of 1974 (“ERISA”).⁵⁰ The effect of this shift is to transfer responsibility for investment decisions from the employer to individual employees. Although the employee directs the investment of his or her retirement funds in a 401(k) plan, the employer selects the menu of investment options available to the individual employees, who are limited to allocating their retirement funds among the choices provided.⁵¹

So-called “participant control” allows the employer to reduce its liability exposure. Specifically, § 404(c) of ERISA exempts fiduciaries from liability for losses caused by participants' exercise of control over assets in their individual accounts.⁵² As of February 2012, the Department of Labor estimated that 72 million individuals are covered

Circuit panel and the dissent from the denial of rehearing regarding today's mutual fund market is a matter for Congress, not the courts.”).

⁴⁸ Defined benefit plans, the category encompassing most traditional pension plans, promise “the participant a fixed level of retirement income, which is typically based on the employee's years of service and compensation.” *LaRue v. DeWolff, Boberg & Assocs.*, 552 U.S. 248, 250 n. 1 (2008) (citation omitted).

⁴⁹ Defined contribution plans promise “the participant the value of an individual account at retirement, which is largely a function of the amounts contributed to that account and the investment performance of those contributions.” *Id.* See also *id.* at 255 (“[d]efined contribution plans dominate the retirement plan scene today”); Edward A. Zelinsky, *The Defined Contribution Paradigm*, 114 *YALE L. J.* 451, 471 (2004) (explaining that at the time that ERISA was enacted, the defined benefit plan was the “dominant paradigm”).

⁵⁰ The Employee Retirement Income Security Act of 1974 (ERISA), 29 U.S.C. § 1132(a)(2).

⁵¹ For an analysis of the effect of providing a menu of alternatives as well as the importance of the menu choices provided see Ian Ayres, *Menus Matter*, 73 *U. CHI. L. REV.* 3 (2006).

⁵² See also 29 CFR § 2550.404c-1 (2007).

by 401(k) plans in which individual participants are responsible for directing the investment of their retirement savings.⁵³

ERISA does not restrict the types of investments that a sponsor may offer through a 401(k) plan – the options commonly include mutual funds, money market funds, real estate accounts, stable value funds, and company stock.⁵⁴ In order to obtain the benefit of ERISA’s section 404(c) safe harbor, a plan must offer investors at least three “diversified” investment options with “materially different risk and return characteristics.”⁵⁵ Most 401(k) plans offer employees substantially more options. According to Brightscope, in 2011 the average 401(k) plan offered employees 24 investment options.⁵⁶ Some plans offer hundreds or even thousands of choices.⁵⁷ Approximately half of all 401(k) plan assets are invested in mutual funds.⁵⁸

Employers usually delegate the administration of their 401(k) plans to an independent service provider, which may be a bank, an investment company, or an insurance company.⁵⁹ The service provider acts as a trustee for the plan and bundles various administrative functions for the employer and helps the employer select the investment options. One study reports that mutual fund families act as trustees for 77% of plans.⁶⁰ Although many service providers include funds from outside the trustee’s family, affiliated funds tend to dominate the product lines of mutual fund trustees. Commentators have identified the selection of the trustee’s own product line as a potential conflict of interest and also

⁵³ UNITED STATES DEPT. OF LABOR, FACT SHEET, FINAL RULE TO IMPROVE TRANSPARENCY OF FEES AND EXPENSES TO WORKERS IN 401(K)-TYPE RETIREMENT PLANS (2012).

⁵⁴ U.S. GOVERNMENT ACCOUNTABILITY OFFICE, 401(K) PLANS, CERTAIN INVESTMENT OPTIONS AND PRACTICES THAT MAY RESTRICT WITHDRAWALS NOT WIDELY UNDERSTOOD, GAO-11-291 (2011).

⁵⁵ 29 C.F.R. § 2550.404c-1(b)(3)(i)(B)

⁵⁶ Jack Hough, *Get the Most From a Lame 401(K) Plan*, WALL ST. J., Oct. 13, 2011.

⁵⁷ See, e.g., Hecker v. Deere & Co., 556 F.3d 575 (7th Cir. 2009) (describing John Deere’s plan as offering more than 2500 investment options).

⁵⁸ Sarah Holden & David Abbey, *Fortune’s Assessment of Industry Stance on 401(k) Fees Is Misguided*, ICI VIEWPOINTS (June 25, 2012).

⁵⁹ U.S. GOVERNMENT ACCOUNTABILITY OFFICE, 401(K) PLANS, *supra* note ____.

⁶⁰ Irina Stefanescu, Veronika Krepely Pool, & Clemens Sialm, *It Pays to Set the Menu: Mutual Fund Investment Options in 401(K) Plans* (2012), available at <http://ssrn.com/abstract=2112263>.

found that trustees may be less inclined to remove one of their own underperforming funds from the plan menu.⁶¹

Service providers charge various types of fees to 401(k) plan sponsors in connection with the provision of administrative services.⁶² Both the amount and the type of the fee can vary dramatically among providers.⁶³ A substantial percentage of plans pass through all or part of fees charged by their service providers to plan participants.⁶⁴ In addition to the plan-level fees, participants pay expenses and fees associated with different investment options offered by the plan, such as mutual fund expenses and transaction fees.

ERISA imposes fiduciary obligations on the sponsor in connection with the selection of investment options, and sponsor contracts with service providers typically vest authority for the selection of investment options in the plan sponsor.⁶⁵ Fiduciaries are required to select and periodically evaluate the plan's mix and range of investment options.⁶⁶ In evaluating whether the sponsor has adhered to its obligations, courts have evaluated the "the range of investment options and the characteristics of those available options, including the risk profiles, investment strategies, and associated fees."⁶⁷

Commentators have debated what these fiduciary obligations mean, specifically the extent to which they require sponsors to choose

⁶¹ *Id.*

⁶² In response to a GAO study which found that many plan sponsors did not know or understand the fees charged by their plans, (see GOVERNMENT ACCOUNTABILITY OFFICE, 401(K) PLANS INCREASED EDUCATIONAL OUTREACH AND BROADER OVERSIGHT MAY HELP REDUCE PLAN FEES, GAO-12-325 (2012)), the Department of Labor adopted new regulations, effective in July of 2012, requiring detailed fee disclosure from service providers to plan sponsors. 29 CFR §2550.408b-2 (Feb. 2012). See also Mary Beth Franklin, *New fee disclosure rules could shake up 401(k) world*, INVESTMENTNEWS (June 24, 2012), describing new disclosure requirements and predicting their effect). In addition, the regulations require, as of August 30, 2012, that fee information be disclosed to plan participants.

⁶³ See GOVERNMENT ACCOUNTABILITY OFFICE, INCREASED EDUCATIONAL OUTREACH AND BROADER OVERSIGHT MAY HELP REDUCE PLAN FEES, GAO-12-325 (2012) (describing range and types of fees).

⁶⁴ See *id.* at 16. See also *id.* at 21 (stating that "[p]articipants generally paid part or all of the fees charged for key 401(k) plan services.").

⁶⁵ 29 U.S.C. § 1002(21)(A). See, e.g., *Renfro v. Unisys Corp.*, 671 F.3d 314, 323 (3d Cir. 2011).

⁶⁶ *Renfro v. Unisys Corp.*, 671 F.3d at 326.

⁶⁷ *Id.*

the lowest-cost mutual fund options.⁶⁸ Commentators have also debated the extent to which sponsors effectively minimize investment costs. Although some argue that retirement plan fees are unduly expensive and that, in particular, the mutual fund options offered by 401(k) plans are more costly and less attractive than available alternatives,⁶⁹ others dispute those claims.⁷⁰

With the formation of BrightScope, in 2009, employers face increasing public scrutiny of their 401(k) plans.⁷¹ Using a proprietary formula, BrightScope collects and analyzes publicly available data about thousands of employer-sponsored 401(k) plans and publishes the results through a series of on-line ratings and rankings.⁷² Although BrightScope claims to include over 200 separate inputs in its analysis, its methodology focuses primarily on the speed with which a plan participant can accumulate sufficient savings to retire.⁷³ This approach has been criticized as skewing BrightScope's ratings results in favor of issuers that have highly compensated employees or generous employer-matching provisions.⁷⁴ BrightScope does, however, analyze investment menu quality, noting that recent academic studies have highlighted "major deficiencies" in plan-level investment menus.⁷⁵ The BrightScope ratings have generated substantial publicity and caused many employers to rethink the structure of their plans.⁷⁶

Courts faced with legal challenges to 401(k) plans have largely focused on whether employers have offered a sufficient number of sufficiently different investment options, rather than the quality of those

⁶⁸ Christopher Carosa, *401k Plan Sponsors and the Mutual Fund Expense Ratio Wild Goose Chase*, FIDUCIARY NEWS, (July 3, 2012).

⁶⁹ Scott Cendrowski, *Is your 401(k) ripping you off?*, CNN MONEY, June 25, 2012, <http://finance.fortune.cnn.com/2012/06/25/retirement-guide-401k-fees/>.

⁷⁰ Holden & Abbey, *supra* note __.

⁷¹ See Lieber, *supra* note __ (describing formation of BrightScope).

⁷² *Id.*

⁷³ See BrightScope website, *Frequency Asked Questions, What is a BrightScope Rating?*, <http://www.brightscope.com/faq/401k-retirement/>.

⁷⁴ See, e.g., Amy Feldman, *How Good is Your 401(k)?*, BLOOMBERG BUSINESSWEEK, (Dec. 30, 2009); Steve Utkus, *Rating Your 401(k)*, Vanguard Blog (March 15, 2010), http://www.vanguardblog.com/2010.03.15/rating-your-401k.html?linkLocation=insights_overview.

⁷⁵ Ryan Alfred & David Allison, BRIGHTSCOPE INVESTMENT MENU QUALITY WHITE PAPER, at 3.

⁷⁶ See, e.g., Michelle Rafter, *BrightScope Shines a Light on 401(k) Plans*, WORKFORCE, (March 10, 2010), (reporting that employers are "making adjustments to their retirement plans because of BrightScope").

options or the choice architecture. In a number of recent cases, employees have sued their employers, alleging a breach of fiduciary duty based on the employer's failure to select appropriate investment options and, in particular, to offer mutual fund options with sufficiently low costs.⁷⁷ In many of these cases, the courts have concluded that the employer has fulfilled its fiduciary obligations merely by offering its employees a sufficient range of investment options. Market competition and investor choice, the cases suggest, provide employees with adequate protection.

In *Hecker v. John Deere*,⁷⁸ for example, the Plan offered employees “a generous choice of investment options” that included “23 different Fidelity mutual funds, two investment funds managed by Fidelity Trust, a fund devoted to Deere's stock, and a Fidelity-operated facility called BrokerageLink, which gave participants access to some 2,500 additional funds managed by different companies.”⁷⁹ All the funds “were available on the open market for the same fee.”⁸⁰ As the court explained, “the undisputed facts [left] no room for doubt that the Deere Plans offered a sufficient mix of investments for their participants.... Importantly, all of these funds were also offered to investors in the general public, and so the expense ratios necessarily were set against the backdrop of market competition.”⁸¹ Similarly, in *Renfro v. Unisys Corp.*,⁸² the court concluded that an employer met its obligations by providing an adequate range and mix of investment options – in the case of Unisys, the plan offered “seventy-three distinct investment options.”⁸³

In contrast, the court in *Braden v. Wal-Mart Stores* refused to dismiss similar allegations concerning Wal-Mart's 401(k) plan.⁸⁴ Braden alleged that Wal-Mart included funds with unreasonably high fees in its 401(k) plan, due in part to alleged fee-sharing between the funds and

⁷⁷ The basis for this litigation stems from the Supreme Court's holding in *LaRue v. DeWolff, Boberg & Associates, Inc.*, 552 U.S. 248 (2008), where the court noted that “a participant in a defined contribution pension plan [may] sue a fiduciary whose alleged misconduct impaired the value of plan assets in the participant's individual account.”

⁷⁸ *Hecker v. Deere & Co.*, 556 F.3d 575 (7th Cir. 2009).

⁷⁹ *Id.* at 578.

⁸⁰ *Id.* at 579.

⁸¹ *Id.* at 586.

⁸² 671 F.3d 314 (3d Cir. 2011).

⁸³ *Id.* at 327.

⁸⁴ 588 F.3d 585, 596 (8th Cir. Mo. 2009)

Merrill Lynch, the plan's trustee.⁸⁵ Braden claimed that this resulted in the Plan paying \$20 million per year in excessive fees.

The Eighth Circuit found that the plaintiff's complaint adequately alleged that Wal-Mart breached its fiduciary duty in selecting investment options for the company's 401(k) plan. "Taken as true, and considered as a whole, the complaint's allegations [were] understood to assert that the Plan include[d] a relatively limited menu of funds which were selected by Wal-Mart executives despite the ready availability of better options. The complaint allege[d], moreover, that these options were chosen to benefit the trustee at the expense of the participants."⁸⁶ The court noted, in particular, that Wal-Mart offered a limited number of options consisting of "ten retail mutual funds, a collective trust, Wal-Mart stock, and a stable value fund."⁸⁷ Comparing Wal-Mart's plan to John Deere's plan, which offered its participants access to more than 2,500 mutual funds, the court stated that the "far narrower range of investment options available in this case makes more plausible the claim that this Plan was imprudently managed."⁸⁸ The court stated that the fact that Wal-Mart offered its employees a choice among only ten mutual fund options made "more plausible the claim that this Plan was imprudently managed."⁸⁹

These 401(k) fiduciary duty cases are premised on two critical assumptions. First, they assume that market forces adequately protect mutual fund investors from excessive fees. Second, they reflect the courts' perception that employers best serve their employees' interests by offering a large menu of investment options. As the next section suggests, research has cast doubt upon the accuracy of both of these assumptions. In particular, employers can easily sabotage their employees' investment decisions by offering plan choices that are too expensive, too complex, or simply too numerous.⁹⁰

II. THE LITERATURE ON INVESTOR DECISION-MAKING

⁸⁵ Following the court's decision, Wal-Mart and Merrill Lynch agreed to a \$13.5 million settlement of the litigation. See William P. Barrett, *Walmart, Merrill Lynch Agree To Pay \$13.5 Million To Settle 401(k) Fiduciary Lawsuit*, FORBES, (Dec. 5, 2011).

⁸⁶ *Id.* at 596.

⁸⁷ *Id.* at 589.

⁸⁸ *Id.* at 596 n. 6.

⁸⁹ Braden v. Wal-Mart Stores, Inc., 588 F.3d 585, 596 n.6 (2009).

⁹⁰ See, e.g., Charles D. Ellis, *Murder on the Orient Express: The Mystery of Underperformance*, 68 FIN. ANAL. J. 13 (2012) (criticizing employers for investing in higher cost actively managed funds in a futile search for outperformance).

Understanding consumer investment behavior is critical because the regulatory structure described above is based in part on assumptions about how individuals make investment decisions. Empirical studies demonstrate a wide variety of investor mistakes ranging from saving too little to trading too frequently.⁹¹ Investors lack basic financial literacy including the ability to understand the effect of compounding or to construct a diversified portfolio. Our study focuses on a widely-reported investor mistake – the willingness to invest in high fee funds despite the evidence that such funds consistently underperform the market. The persistence of this behavior weighs against the claim that competition in the market for mutual funds can keep fees low without regulatory oversight.

A. *Cost-Sensitive Investing*

Studies strongly suggest that, of the information available to retail investors, fund expenses are the best predictor of future returns, and that lower expenses are correlated with higher returns.⁹² Morningstar’s Director of Mutual Fund Research has observed, “[i]f there’s anything in the whole world of mutual funds that you can take to the bank, it’s that expense ratios help you make a better decision.”⁹³ In one recent study, Cooper, Halling, and Lemmon found that among the funds in their sample, lower-fee funds outperformed otherwise observably identical higher-fee funds by 32%.⁹⁴

The literature in this area is extensive, and the results of some studies conflict.⁹⁵ Nonetheless, most studies find that high-fee funds underperform both their lower fee competitors⁹⁶ and passively managed

⁹¹ See, e.g., THE LIBRARY OF CONGRESS, BEHAVIORAL PATTERNS AND PITFALLS OF U.S. INVESTORS (2010) (summarizing economic studies of investor mistakes).

⁹² See Fisch, *supra* note __ at 1993 (summarizing studies).

⁹³ Morningstar compared the predictive power of its star ratings (which take into account expenses as well as other variables) to expense ratios alone, and found that expense ratio alone was a better predictor of future fund performance than the star ratings in a majority of the years analyzed. Russel Kinnel, *How Expense Ratios and Star Ratings Predict Success*, MORNINGSTAR, Aug. 9, 2012, <http://news.morningstar.com/ARTICLENET/ARTICLE.ASPX?ID=347327>).

⁹⁴ Cooper, et al., *supra* note __.

⁹⁵ See Martijn Cremers, et al., *The Mutual Fund Industry Worldwide* (2011), available at <http://ssrn.com/abstract=1830207> (identifying the conflicting literature).

⁹⁶ Michael J. Cooper, Michael Halling, & Michael L. Lemmon, *Violations of the Law of One Fee in the Mutual Fund Industry* (2012), available at <http://ssrn.com/abstract=1456079>; Javier Gil-Bazo & Pablo Ruiz-Verdú, *The Relation*

index funds that provide a market rate of return.⁹⁷ Although there is evidence that *some* managers have superior stock-picking ability that persists over time,⁹⁸ many studies find that managers are not able to beat the market over the long run.⁹⁹ Even if some funds consistently outperform the market, the percentage of funds that do so appears to be quite small, and it is unlikely that the average retail investor is capable of identifying outperformers.

Nonetheless, investors continue to purchase higher fee funds. The reason for this behavior is unclear.¹⁰⁰ Some investors appear to believe that higher fees are correlated with better performance, in accordance with the adage, “you get what you pay for.”¹⁰¹ Other investors appear to underestimate the economic significance of fund fees.¹⁰² And for others, fees may be presented in a manner that is too complex or difficult to

Between Price and Performance in the Mutual Fund Industry, 64 J. FIN. 2153, 2154 (2009); John A. Haslem et al., *Identification and Performance of Equity Mutual Funds with High Management Fees and Expense Ratios*, 16 J. INVESTING 32 (2007).

⁹⁷ Martin J. Gruber, *Another Puzzle: The Growth in Actively Managed Mutual Funds*, 53 J. OF FIN. 783 (1996).

⁹⁸ Martijn Cremers & Antti Petajisto, *How Active is Your Fund Manager? A New Measure That Predicts Performance* 22 REV. FIN. STUD. 3329 (finding that the most active funds, as opposed to closet indexers, can outperform their benchmarks net of fees.) See also Robert Kosowski et al., *Can Mutual Fund “Stars” Really Pick Stocks?: New Evidence from a Bootstrap Analysis*, 61 J. FIN. 2551 (2006); Baker et al., *Can Mutual Fund Managers Pick Stocks? Evidence from Their Trades Prior to Earnings Announcements*, 45 J. FIN. & QUANT. ANAL. 1111 (2010).

⁹⁹ Ronald N. Kahn & Andrew Rudd, *Does Historical Performance Predict Future Performance?*, 51 FIN. ANALYSTS J. 43 (1995); Mark M. Carhart, *On Persistence in Mutual Fund Performance*, 52 J. FIN. 57 (1997); Nicolas P. B. Bollen & Jeffrey A. Busse, *Short-Term Persistence in Mutual Fund Performance*, 18 REV. FIN. STUD. 569, 594-95 (2004).

¹⁰⁰ The empirical findings may be complicated by the fact that some mutual fund fees are directly used to market funds. Studies have shown that loads and 12b-1 fees have a positive effect on market share. See Ajay Khorana, *What Drives Market Share in the Mutual Fund Industry?*, 16 REV. FIN. 81 (2012).

¹⁰¹ See Neil Weinberg, *Fund Managers Know Best*, FORBES 220 (Oct. 14, 2002) (finding that many investors believe higher fee funds are better performers).

¹⁰² John Beshears et al., *How Does Simplified Disclosure Affect Individuals’ Mutual Funds Choice?*, in EXPLORATIONS IN THE ECONOMICS OF AGING (University of Chicago Press 2011). One recent study finds that investors overwhelmingly rely on past performance rather than cost information and select funds with high past performance even when cost information is completely omitted. See Beth A. Pontari et al., *Regulating Information Disclosure in Mutual Fund Advertising*, 32 J. CONSUM. POLICY 333 (2009).

find.¹⁰³ As former SEC Chair Arthur Levitt testified before Congress in 1998, “[o]ur own research shows that fewer than one in five fund investors could give any estimate of expenses for their largest mutual fund and fewer than one in six fund investors understood that higher expenses can lead to lower returns.”¹⁰⁴

These studies offer reason to question the degree to which the mutual fund market is competitive, despite investors’ ability to redeem mutual fund shares at any time for their net asset value and to replace those funds with others that are competitively priced.¹⁰⁵ The law of one price suggests that similar products should have similar prices and that fee dispersion should not persist unless products are truly different.¹⁰⁶ Nonetheless, substantial price dispersion persists in the mutual fund market – price dispersion that does not appear to be explained by product differences.¹⁰⁷ One recent paper found that, after controlling for fund characteristics, “the average spread in residual fees (between the 1st and 99th percentile) across all funds over the sample [was] 2.34%.”¹⁰⁸

¹⁰³ See, e.g., Brad M. Barber et al., *Out of Sight, Out of Mind: The Effects of Expenses on Mutual Fund Flows*, 78 J. BUS. 2095, 2107 (2005) (finding that investors have learned to reject high load funds, but continue to ignore operating expenses). See also Mark Grinblatt, et al., *IQ and Mutual Fund Choice* (2012), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2021957 (finding that investors with high IQs tended to avoid higher fee funds). But see James J. Choi et al, *Why Does the Law of One Price Fail? An Experiment on Index Mutual Funds*, 23 REV. FIN. STUD. 1405 (2010) (finding that almost none of subject minimized fees despite reporting importance of fees, but that minimizing search costs only modestly improved portfolio allocations).

¹⁰⁴ Arthur Levitt, *The Numbers Game*, Speech at NYU Law School (Sept. 28, 1998), available at <http://www.sec.gov/news/speech/speecharchive/1998/spch220.txt>.

¹⁰⁵ A number of articles argue that the mutual fund market is competitive. See, e.g., Ajay Khorana & Henri Servaes, *What Drives Market Share in the Mutual Fund Industry?*, __ REV. FIN. __ (forthcoming 2012) (finding that higher-fee fund families have lower market shares); Sunil Wahal & Albert Wang, *Competition among mutual funds*, 99 J. FIN. ECON. 40 (2011), (finding that the mutual fund market, at least after 1998, is competitive and that the price competition introduced by new entrants reduces management fees).

¹⁰⁶ See Choi et al, *supra* note __ (questioning whether demand for non-portfolio services can justify higher fees).

¹⁰⁷ Peter Wallison & Robert E. Litan, *COMPETITIVE EQUITY* (2007). See also Choi, et al., *supra* note __ (finding substantial fee variation among index funds that are designed to follow an identical and largely mechanical investment strategy).

¹⁰⁸ Cooper et al., *supra* note __, at 4.

Another study found that, even in the absence of product differences, investors failed to minimize fees.¹⁰⁹

B. Diversification

In addition to evidence that investors do not choose funds based on price, there is some evidence that investors do not choose at all—instead, they simply divide their money among the available options, an approach that has been termed “naïve diversification”¹¹⁰ Bernartzi and Thaler first demonstrated this phenomenon in a series of experiments in 2001.¹¹¹ They found that subjects asked to make investment decisions had a strong inclination to spread their money, essentially investing $1/n$ into each of the n funds that was offered as investment choices irrespective of the particular choice set or the attributes of the options at hand.

Research has also demonstrated that investors formulate their asset allocation decisions based on the alternatives provided rather than independently determining an appropriate allocation.¹¹² This approach has been termed the “menu effect.”¹¹³ The menu effect, coupled with naïve diversification may lead investors to fail to reject even unattractive investment options. If investors do not reject less attractive options, offering them a range of choices does not prevent poor investment decisions, and may counterproductively induce them.

Finally, as noted above, policies that favor choice itself may be misguided given evidence of the effects of many choices on decision-making quality. Investors express a preference for choosing from a large assortment of products,¹¹⁴ but it isn’t clear that more choice is better for investors in retirement accounts. First, increasing the number of

¹⁰⁹ Choi et al, *supra* note ____.

¹¹⁰ Schlomo Benartzi & Richard H. Thaler, *Naïve Diversification Strategies in Defined Contribution Saving Plans*, 91 AM. ECON. REV. 79-98 (2001).

¹¹¹ *Id.*

¹¹² See also Nina Tang, et al., *The efficiency of sponsor and participant portfolio choices in 401(k) plans*, 94 J. PUB. ECON. 1073 (2010) (finding that investors fail to construct efficient retirement portfolios, where efficiency is designed as maximizing their risk-adjusted return, and that individual allocation strategy are even less efficient than using a $1/n$ heuristic).

¹¹³ Maureen Morrin, et al., *Saving for Retirement: The Effects of Fund Assortment Size and Investor Knowledge on Asset Allocation Strategies*, 42 J. CONSUM. AFF. 206 (Jul 2008).

¹¹⁴ *Id.*

investment options increases investors' tendency to invest in a large number of funds, although a very large number of choices appears to reduce the extent to which investors engage in complete naïve diversification as discussed above.¹¹⁵ Second, and more problematically, increasing the amount of choice actually may lower employee participation rates. In one recent article, researchers looked at a broad collection of data on investment decisions made by over 500,000 employees and found that increasing the number of investment options decreased both equity allocation and overall investment levels.¹¹⁶

C. Proposed Mechanisms and Proposed Solutions for Investor Mistakes

Although the empirical literature identifies a variety of possible shortcomings in investor decision-making, the precise mechanisms driving the choice of high-fee funds remain unclear. One possibility is that investment disclosure is inadequate. The SEC has repeatedly revised and refined its disclosure requirements for mutual funds in an effort to address the concern that investors do not choose their funds rationally.¹¹⁷ Yet one of the more recent studies to examine the effectiveness of these reforms found that the introduction of the summary prospectus had no effect on investor behavior.¹¹⁸

Another possibility is that investors are inadequately informed about the task at hand or the fundamentals of investing. When investing for retirement, for example, employees are not typically provided with instructions such as the appropriate number of options to choose or the correct allocation between equity and fixed income. Investors do not receive training in the difference between active and passive management. Investors are not even instructed as to the importance of fees in selecting among investment alternatives. And at an even more basic level, people are confused about the math. Finance scholars Lusardi and Mitchell found that more than half of participants in a demographically diverse sample did not realize that mutual funds do not pay a guaranteed rate of return, and fewer than 20% could correctly

¹¹⁵ See Morrin, *supra* note __ (“considering a larger number of funds to invest in may be overwhelming for many investors, resulting in choosing more funds for investment and allocating the invested dollars evenly across the chosen funds”).

¹¹⁶ Sheena S. Iyengar & Mark R. Lepper, *When Choice is Demotivating: Can One Desire Too Much of a Good Thing?*, 79 J. PERSON. & SOC. PSYCH. 995 (2000).

¹¹⁷ See Fisch, *supra* note __.

¹¹⁸ Beshears, *supra* note __.

answer a multiple-choice question about the calculation of compound interest.¹¹⁹

Even ideal disclosure requirements will have limited effectiveness, though, if investors are unable to use the information provided.¹²⁰ Lack of investor education or overtaxed cognitive resources might explain the inability of investors to estimate the costs associated with a 1% difference in fees, for example, or the willingness of investors, even post-Enron, to invest a substantial portion of their retirement accounts in company stock. To the extent that these shortcomings are due to behavioral biases, little effort has been made to overcome them.¹²¹ The literature continually identifies the inability of investors to demonstrate a basic understanding of investment principles, but little effort has been devoted to determining how to improve that understanding.

Understanding the reasons for existing investor behavior is critical to designing more effective regulatory approaches. As noted above, Congress recognized as much when, as part of Dodd-Frank, it required the SEC to conduct a study of investor financial literacy.¹²² The report of the study, which the SEC released on August 30, 2012, was a disappointment.¹²³ Although Congress had directed the SEC to identify the existing level of financial literacy among retail investors and to study such issues as designing more effective disclosure and identifying a strategy to improve financial literacy, the SEC's efforts were extremely limited.

¹¹⁹ Annamaria Lusardi & Olivia S. Mitchell, *Financial literacy and retirement planning in the United States*, 10 J. PENSION ECON. & FIN. 509 (2011).

¹²⁰ See Jeff Schwartz, *Reconceptualizing Investment Management Regulation*, 16 GEO. MASON L. REV. 521 (2009) (arguing that, in the absence of investor education, SEC disclosure rules do not lead investors to make better investment decisions).

¹²¹ In the one area in which such biases appear clear – the tendency of investors to place undue weight on past performance – the regulatory response has been tepid. Rather than limiting advertisements highlighting past performance, despite their substantial influence on investment decisions, the SEC simply requires such advertisements to contain language informing investors that “past performance does not guarantee future results.” See Molly Mercer, et al., *Worthless Warnings: Testing the Effectiveness of Disclaimers in Mutual Fund Advertisements*, 7 J. EMPIR. LEG. STUD. 429 (2010) (explaining that past performance advertising is highly effective and demonstrating that current SEC disclaimer is too weak).

¹²² Dodd-Frank Act, *supra* note 13, at § 917.

¹²³ SEC PRESS RELEASE, SEC ISSUES FINANCIAL LITERACY STUDY MANDATED BY THE DODD-FRANK ACT (2012).

The study concluded that U.S. retail investors “lack basic financial literacy,”¹²⁴ but the SEC focused primarily on investor preferences rather than attempting to identify mechanisms to improve the quality of investor decisions. For example, the SEC conducted a substantial online survey, in which subjects were given investment information to review.¹²⁵ The SEC did not question the investors on their understanding of the material provided but on their perceptions of the presentation and complexity of the information provided. For example, rather than trying to determine whether investors could reliably locate information contained in a summary prospectus, the SEC asked them whether they found it difficult to locate the information that they needed.¹²⁶

Although the SEC study offered little of practical value, an improved understanding of retail investor decision-making can assist regulators in improving the manner in which approximately \$19 billion of U.S. retirement assets are invested.¹²⁷ This information could also assist employers in designing retirement plans to optimize allocation decisions by employees. Furthering these objectives require untangling the reasons for investor mistakes. Do investors fail to identify the proper objectives? Are they unable to locate the information that they need? Or are they unable to evaluate that information accurately? Our experiment, described in the next section, offers an initial step toward obtaining this understanding.

III. OUR EXPERIMENT

To increase understanding of how retail investors make investment decisions, we designed an experiment to simulate the process of allocating a retirement account among a selection of mutual funds. Our experiment created a web-based user interface to provide subjects with ten fictional mutual fund choices. Information about each of the choices was provided through clickable links. Investors allocated an investment among the ten funds and our software recorded their

¹²⁴ SEC STAFF STUDY, *supra* note 2, at iii.

¹²⁵ Investors were given summary prospectuses of several mutual funds, but the fund names were changed to the fictitious “Petunia,” “Gardenia” and “Hydrangea” funds.

Id.

¹²⁶ *Id.*

¹²⁷ As of June 30, 2012, US retirement assets totaled \$18.5 trillion. INVESTMENT COMPANY INSTITUTE, RETIREMENT ASSETS TOTAL \$18.5 TRILLION IN SECOND QUARTER 2012, RETIREMENT STATISTICS (2012).

allocation decisions. In addition, our website required investors to click through the site in order to obtain specific information about fund choices and their attributes. Because our technology allowed us to collect these clicks, we are able to identify which information investors reviewed. After the subjects submitted their allocations, we collected additional survey information about the subjects' beliefs, risk preferences and investment experience, as well as demographic information.

A. *Study Design*

Subjects were instructed to allocate an initial \$10,000 among the ten fund choices. The experiment did not permit subjects to submit an allocation unless their allocations totaled exactly 100% of the \$10,000. The subjects were told that they were investing for retirement and that the overall value of their portfolio would be calculated based on a simulated thirty-year performance. We attempted to provide an incentive for subjects to allocate carefully by instructing them that they would be paid a bonus based on the performance of the portfolio that they chose.¹²⁸

Our fund allocation page (Figure 1) listed the ten mutual fund choices. By clicking on the fund name, subjects accessed a fund information page (Figure 2) that provided a brief description of the fund. In turn, the fund information page contained four buttons allowing subjects to obtain information on four specific fund attributes – performance, risk, fees and holdings. Each button allowed subjects to click through to obtain more detailed information (Figure 3).

¹²⁸ See section IIIB (describing performance bonuses paid to each group of subjects).

Figure 1. Fund allocation page

Please allocate your hypothetical retirement account of \$10,000 by designating the percentage that you wish to invest in each of the 10 funds below. Your allocations must total 100%. Press the submit button when you are done. You can click on each of the fund names for additional information about the fund.

FUND No	FUND TYPE	FUND NAME	ALLOCATION
1	Money Market Fund	The Jones Fund	0 %
2	Money Market Fund	The Smith Fund	0 %
3	Fixed Income Fund	The Skyler Fund	0 %
4	Fixed Income Fund	The Durns Fund	0 %
5	Equity Index Fund	The White Fund	0 %
6	Equity Index Fund	The Brown Fund	0 %
7	Managed Equity Fund	The Thomas Fund	0 %
8	Managed Equity Fund	The Hamlin Fund	0 %
9	Managed Equity Fund	The Lowe Fund	0 %
10	Managed Equity Fund	The Powell Fund	0 %
Total			0

Submit

Figure 2. Fee information page, money market fund

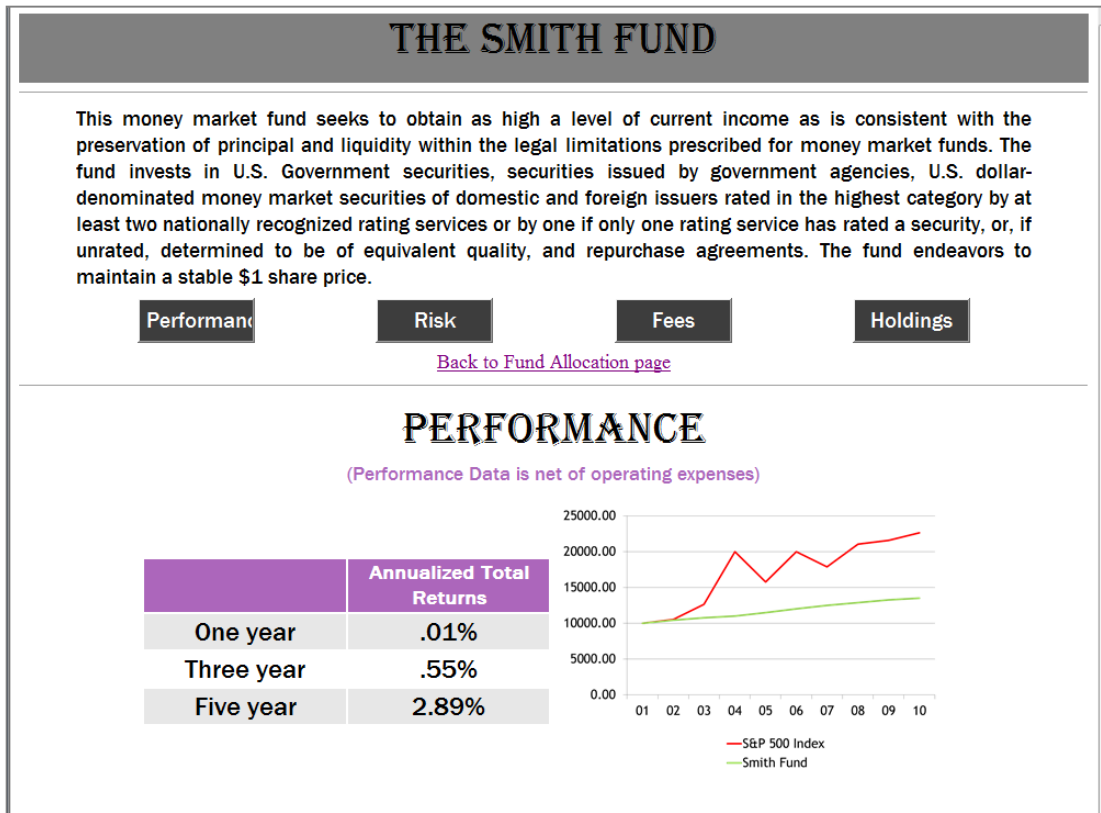
THE SMITH FUND

This money market fund seeks to obtain as high a level of current income as is consistent with the preservation of principal and liquidity within the legal limitations prescribed for money market funds. The fund invests in U.S. Government securities, securities issued by government agencies, U.S. dollar-denominated money market securities of domestic and foreign issuers rated in the highest category by at least two nationally recognized rating services or by one if only one rating service has rated a security, or, if unrated, determined to be of equivalent quality, and repurchase agreements. The fund endeavors to maintain a stable \$1 share price.

Performance
Risk
Fees
Holdings

[Back to Fund Allocation page](#)

Figure 3. Money market fund with performance information shown



The information provided for each fund was presented in an identical and highly simplified format. Our study was designed to focus on information and motivation-based reasons for investor mistakes rather than cognitive reasons for such mistakes. As a result, we highlighted the information that might conceivably be relevant to the investment decision and made that information directly comparable across the fund options.

Performance information included a graph showing the fund’s ten-year performance as well as the performance of the S&P 500 (over the same hypothetical time period) and a chart showing annualized one-, three- and five-year returns. Fee information consisted of a single number showing the fund’s current expense ratio. Our study was specifically constructed to reduce the likelihood that investor choices

were due to confusion or inability to understand the fee disclosure.¹²⁹ Risk description language was taken from real mutual fund prospectuses, and the holdings page listed each funds' top ten holdings and showed the percentage of fund assets invested in each, again modeled on actual funds.

As noted above, the funds in the experiment were modeled on real world funds – fee levels, holdings and descriptive language were taken from real mutual fund documents. The choice to construct fictional funds was driven in part by a desire to avoid the potentially distortionary effect of the Financial Crisis of 2008 on reported fund performance. In addition, using fictional funds also allowed us to control the degree to which funds differed from each other. For example, we constructed several fund pairs that varied across only a single dimension, such as fees.

We gave our funds generic names such as the Smith Fund, much like those used in the SEC study of investor literacy,¹³⁰ to avoid the possibility that investors would infer information about fund style or strategy from the names of the funds.¹³¹ On the fund allocation page, we also randomly varied the order in which funds appeared within their fund category. A simplified presentation of fund attributes appears in Table 1.

¹²⁹ We did not include loads, 12b-1 fees, sponsor fee waivers or other types of expenses. Haslem has argued that investors lack the information they need to make efficient fund choices because the expense ratio does not break out all costs or include all cost categories. Haslem, *supra* note ____.

¹³⁰ The SEC named its fictional funds “Petunia Core Equity,” “Gardenia Asset Allocation Portfolio,” and “Hydrangea Bush Government Bond Fund.” SEC Staff Study, *supra* note 2.

¹³¹ See Michael J. Cooper, et al., *Changing Names with Style: Mutual Fund Name Changes and Their Effects on Fund Flows*, 60 J. FIN. 2825 (2005) (finding investors directed money into funds that changed their names to reflect a “hot investment style”).

Table 1. Fund Attributes

Fund	Type	5-year return	Fees
1	Money Market	2.89%	.43%
2	Money Market	2.91%	.43%
3	Fixed Income	7.5%	.87%
4	Fixed Income	5.41%	.83%
5	Equity Index	8.67%	.10%
6	Equity Index	8.62%	.45%
7	Managed Equity	9.1%	.61%
8	Managed Equity	8.67%	.61%
9	Managed Equity	9.0%	1.62%
10	Managed Equity	9.7%	2.1%

We collected information on how subjects allocated their \$10,000 as well as the specific clicks that each subject made in order to view additional information about the funds. After the subjects submitted their allocations, they were asked to answer a series of questions about their investment beliefs, risk preferences and investment experience. Subjects were also asked to supply demographic information and to identify “the most important factor in my choice of retirement funds in this study.”

After completing the questionnaire, subjects received a message showing the final value of their retirement portfolio. The website calculated this value by using a rough algorithm simulating fund returns over thirty years. Returns were ranked by asset class.¹³² Consistent with our hypothesis, funds within each class were ranked so that funds with lower fees yielded higher returns. Because we were agnostic, for purposes of this study,¹³³ about the relative merits of professionally

¹³² Equity funds paid a higher return than bond funds, which paid more than money market funds. Our algorithm also included an adjustment factor for risk, a component of our experiment that is analyzed in a separate article.

¹³³ Commentators generally agree that retail investors should prefer passively managed funds both because of their lower costs and because investors lack the ability to select among mutual fund managers. See, e.g., Rick Ferri, Indexes Beat Active Funds Again in S&P Study, Forbes.com, Oct. 11, 2012, <http://www.forbes.com/sites/rickferri/2012/10/11/indexes-beat-active-funds-again-in->

managed funds versus passive indexing, we structured the returns of our lowest cost index fund and actively managed equity fund to be identical on a cost-adjusted basis. The distribution of possible portfolio values and fees is shown in Table 2.

Table 2. Distribution of possible fees and payouts

Maximum Portfolio Value (100% invested in highest performing fund)	\$76,120
Minimum Portfolio Value (100% invested in lowest performing fund)	\$15,630
Portfolio Value with 10% invested in each fund	\$38,989-49,543
Maximum Fee (100% invested in highest fee fund)	2.1%
Minimum Fee (100% invested in lowest fee fund)	.10%
Average fee (effective fee with 10% invested in each fund)	.81%

B. Subjects

Our study drew from two subject pools. Table 3 contains basic demographic information on each group of subjects. The first group of subjects was made up of undergraduate students, graduate students, and some staff who took the study at the University of Pennsylvania’s Wharton Behavioral Lab (WBL). The Wharton Behavioral Lab draws subjects from across the University of Pennsylvania campus, primarily undergraduates. Its subjects are not confined to students affiliated with the Wharton business program.

The second group of subjects signed up through Amazon Mechanical Turk (MTurk) and took the study online. Although some scholars have raised questions about the external validity of online subject pools like Amazon Turk that pay subjects very small amounts for small tasks and short questionnaires,¹³⁴ others have found that they are

[sp-study/](#) (detailing consistent underperformance of actively-managed funds and portfolios).

¹³⁴ See Armin Falk & Ernst Fehr, *Why Labour Market Experiments?*, 10 LABOUR ECON. 399, 402 (2003) (exploring the role of stake levels); see also Ernst Fehr & John List, *The Hidden Costs and Returns of Incentives - Trust and Trustworthiness among CEOs*, 2 J. EURO. ECON. ASS’N 743 (2004) (finding differences in the behavior of students and CEOs in studies concerning the effect of incentives).

comparable to other survey panels.¹³⁵ Our goal in this study was to simulate the allocation decision faced by ordinary employees choosing among investment options in their 401(k) plans. Using subjects who may have below-average means or sophistication is appropriate for a study that seeks to describe and address the investment choices of employees with little specialized knowledge or investment experience.¹³⁶

Table 3. Subject demographics, by subject pool.

	MTurk	WBL
Total number of subjects	197	201
Median age	32	20
Percent female	52%	67%
Percent owning a mutual fund	43.1%	12.9%
Percent who have a retirement account	54.9%	8.5%
Percent with college education	58.4%	33.8%
Percent reporting somewhat to very stable income	67.0%	71.6%

We incentivized our subjects to select funds carefully by providing a performance-based bonus. MTurk participants were paid a base rate of \$1 for completing the study and an additional \$1 bonus if their portfolio value was above the median in that subject pool. Subjects who participated in the study via the Wharton Behavioral Lab were paid a \$10 show-up fee for a session that included this experiment as well as other studies. They were instructed that they would also receive a bonus payment proportionate to their total portfolio value at the end of the session – one dollar for every \$10,000 in their portfolio (rounded to the nearest quarter).

¹³⁵ U.S. workers on Mechanical Turk are arguably closer to the U.S. population as a whole than subjects recruited from traditional university subject pools. See Gabriele Paolacci, Jesse Chandler, & Panagiotis G. Ipeirotis, *Running Experiments on Amazon Mechanical Turk*, 5 JUDG. & DECISION MAKING 411 (2010).

¹³⁶ We note that the self-reported education level of Mechanical Turk subjects is higher than that of the general population. See *id.*

C. Experimental Manipulation

We focus on investors' consideration of fees in their allocation decisions, in part because of the extensive controversy over the extent to which investment decisions provide market discipline and in part because of the legal implications of the answer to this question. To test the potential for education to affect investors' consideration of fees, our experiment contained an experimental manipulation. Specifically, we divided our subjects randomly into three groups – Performance, Fees and Control. We provided subjects in the Fees group with an instruction designed to focus investors on the importance of considering fee information in the selection process.

Fee Condition Instruction:

In making your investment decision, you may want to consider the following information: The most important single factor in mutual fund performance is the fund's operating expenses (in other words, its fees).

We provided subjects in the Performance Group with an instruction comparable to the instruction required by the SEC.

Performance Condition Instruction:

In making your investment decision, you may want to consider the following information: studies have shown that past performance does not predict future returns.

Subjects in the Control condition did not receive any additional instruction. Because of the complex relationship between fees and performance, as noted in Part II above, we consider the effect of the performance instruction in other work. We report here only on the comparison of the Fees Group and the Control Group.

As a robustness check, we also asked participants who received a special instruction in the questionnaire portion of the experiment to identify the instruction that they received from a list of seven alternatives.¹³⁷

¹³⁷ 49.2% of the Turk Group and 57.2% of the Wharton Group correctly identified their own condition.

IV. STUDY RESULTS

A. Overall Descriptive Results

We report data from 197 Amazon Turk subjects and 201 University of Pennsylvania subjects. Because of the demographic differences between our groups, we report results separately.¹³⁸

To summarize, our overall results provide a basis for guarded optimism are as follows. First, we found that investors understood the general objectives and design of the study – they invested, in the aggregate, the most money in the two funds that we had designed to be the most efficient investment options – the low cost equity index fund and the low cost actively managed fund. Second, we found that investors diversified, probably excessively, but we found segmentation within our investor pool. Third, we found that the fee instruction mattered. These results are considered in more detail below.

Table 4. Basic descriptive means, by subject pool

	MTurk	WBL
Minutes logged in	12.7	11.3
Total clicks	34.3	59.0
Mean clicks on fees	6.86	11.77
Mean clicks on risk	4.70	9.32
Mean clicks on holdings	3.25	7.08
Mean clicks on performance	7.98	13.76
Total number of funds invested in	6.39	7.33
Percent Investing in all 10 funds	27.9%	32.4%
Percent correctly identifying own condition	49.2%	57.2%
Average portfolio value	\$47,679	\$48,839
Average pay	\$1.50	\$4.91

The subjects from the two pools were very similar in terms of their overall choices and performance in the task, with some important exceptions. The University of Pennsylvania subjects accessed a much higher quantity of information, clicking through many more links. The MTurk subjects invested in fewer overall funds, and were less likely to

invest in all ten funds. We also note here, as is reflected in the significance tests below, that there is generally more variance in the data from the Turk subjects.

Figure 5 shows the mean investment across conditions in each fund. Figure 6 shows the overall distribution across subjects of the debt/equity split.

B. *Investment Patterns*

Before discussing the results of our experimental manipulation, we observe some overall patterns in how subjects chose funds across conditions in order to get a sense of subjects' baseline preferences and strategies. First, we note that most subjects chose a reasonable debt/equity balance (see Figure 5), and that the most popular investments were the two investments that should have been the most attractive – the low-fee index fund and the low-fee managed fund. Figure 6 shows the mean investment in each fund, by subject pool. Note that Figure 6 shows the means aggregated across conditions, but the overall pattern is the same if we look only at subjects in the Control condition.

Second, we see substantial evidence of a strong preference for diversification, naïve or otherwise¹³⁹; from these patterns of investment it seems clear that subjects were not trying to pick funds. We expected investors would attempt to identify the best fund in each category and to invest in two or three funds, depending on the extent to which they wanted to diversify between fixed income and equity and between passive and active investment strategies – subjects about which we remained agnostic for purposes of this study. Instead, we found that only 7.5% of WBL and 17.8% of MTurk subjects chose three or fewer funds.

The results on diversification are less discouraging than might appear from the aggregated statistics on average number of funds invested in, however. Specifically, we see segmentation within our subject pools. As Figure 5 bears out, our aggregate results on diversification combine different investment patterns. In the WBL pool, for example, about a third of subjects invested in 4-6 total funds, and only a third invested in all ten funds. Although the subjects who invested in all ten funds – those who diversified most naively – do not appear to differ from our other subjects along the dimensions captured by our study, we suspect that these are different kinds of investors, and that this

¹³⁹ See Bernartzi & Thaler, *supra* note ____.

market may be segmented in some important ways that we flag here for future research.

More problematically, naïve diversification may explain a number of investment decisions that otherwise appear irrational or uninformed. For example, our study contained two index funds that were described as identical except for fees – they tracked the same index, contained the same holdings and reported the same past performance. 74.6% of WBL participants and 65.2% of MTurk participants who invested in the low-fee index fund also invested in the high-fee index fund. Similarly, 68% of MTurk investors allocated at least some money to a higher-fee actively-managed fund that was really just a closet index fund – its holdings and performance were identical to those reported by the index funds -- as did 74.1% of WBL subjects. On a somewhat different dimension, 79.6% of WBL and 74.1% of MTurk investors allocated at least some money to a money market fund even though they were told that they were investing for a 30-year time frame in which liquidity concerns should have been minimal and the reported returns of the money markets were significantly lower than the other fixed income alternatives.

Figure 5. Histogram showing mean percentage (aggregated across conditions) of portfolio invested in each fund, by subject pool

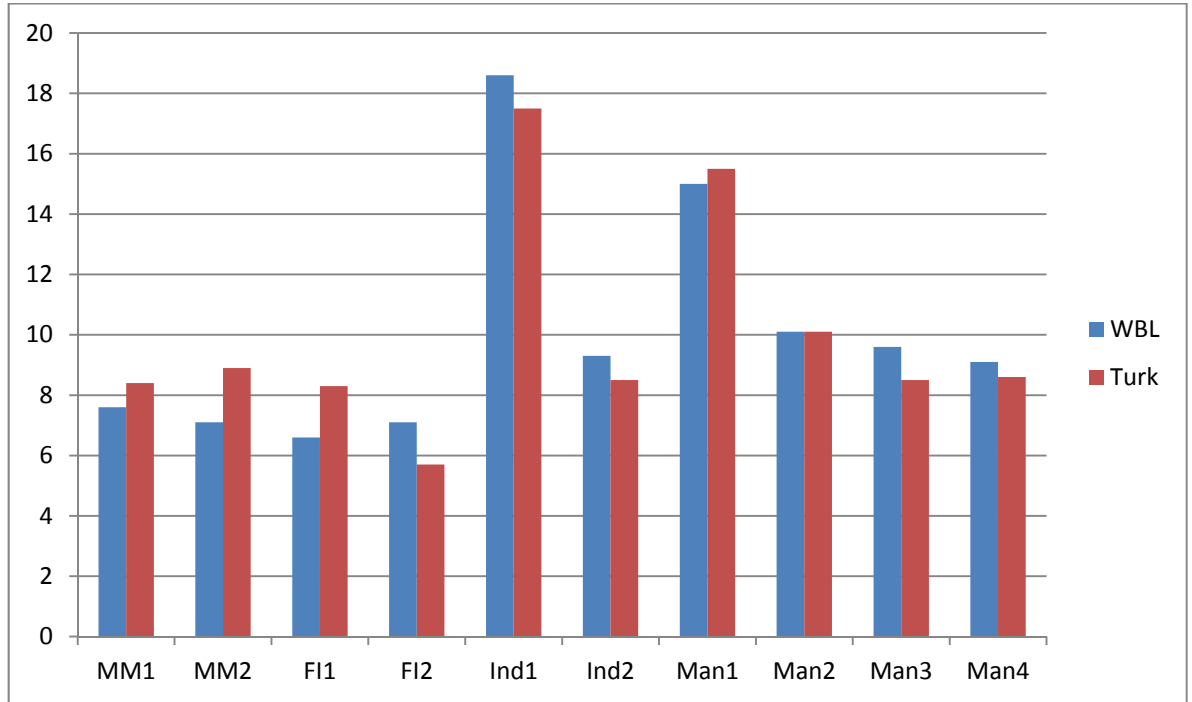
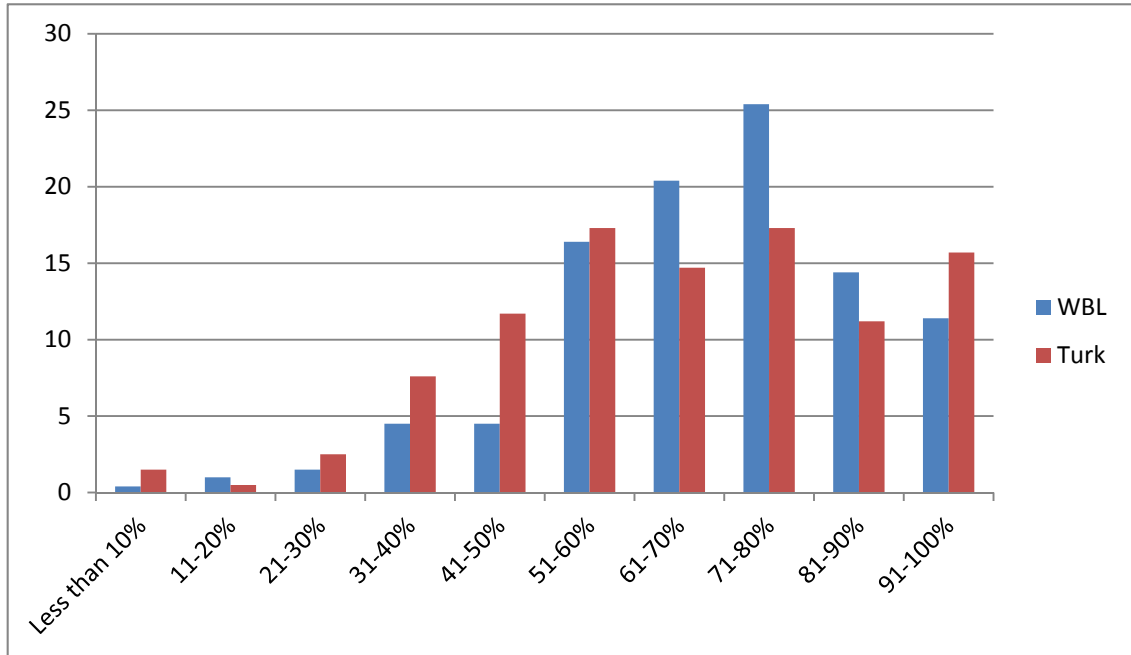


Figure 6. Histogram showing mean percentage (aggregated across conditions) of total portfolio invested in equity, by subject pool



C. Response to Fee Instruction

In this section we analyze the effect of the Fees instruction on subjects' beliefs and choices. Here we compare the responses of the 72 WBL subjects assigned to the Fees condition with the responses of the 60 subjects assigned to the Control condition, and separately, the responses of 64 subjects in the Fees condition with 65 in the Control condition from the MTurk pool.¹⁴⁰ As noted above, we exclude subjects in the performance group from this set of analyses.¹⁴¹

¹⁴⁰ We also analyzed gender differences. Men and women in the Wharton subject pool did not differ on any of the primary dependent variables, including portfolio composition and clicking patterns. Women in the Turk pool invested significantly more in safe (fixed income) funds than men (34.8% vs. 27.4%, $p=.015$).

¹⁴¹ As a general matter, the behavior of those subjects who received the performance instruction was similar to that of the control group. For our primary variables, including fee clicks, average fee paid, the importance of fees and investment in the lowest and highest fee funds, the results of the performance group were statistically

We found that investors who received the Fees instruction differed from the control group along three dimensions – they sought more information about fees, they reported believing that fees were more important, and they shifted their allocations toward lower cost funds.¹⁴²

1. Search for Information: Fee Clicks

The fee disclosure significantly affected how subjects collected and used fee information. As Table 5 indicates, subjects in the Fees group were much more likely to look at a fund’s fees. On average, WBL subjects in the Fees group clicked 40% more on the fees buttons, meaning that they viewed fee information 40% more often, than subjects in the control group. The increase was even more dramatic for subjects from the MTurk pool, where subjects in the Fees group clicked more than twice as often on the fee disclosure than subjects in the control group. In both subject pools, the Fees instruction caused investors to search for more fee information than the control group.

Table 5. Fee Clicks by Condition, for WBL and MTurk samples

	Fee Group Mean	Control Group Mean	T	Df	p
Fee Clicks: WBL	14.82	10.40	3.10	129.62	.002
Fee Clicks: MTurk	9.36	4.09	4.37	101.87	.000

2. Beliefs about the Importance of Fees

The Fees instruction also affected subjects’ beliefs about the importance of fund fees. We report group means and significance statistics for WBL participants in Table 6, and for MTurk participants in Table 7. The effects were very similar across subject pools. Overall, in both subject pools, subjects in the Fees condition were less likely than subjects in the control group to agree that a fund’s fees do not affect

indistinguishable from the control group. The performance instruction did generate marginal differences in the investors’ allocation among the various funds.

¹⁴² All statistical tests reported here are two-sided t-tests, comparing the variable means across conditions. We report the results of the main statistical tests of significance in tables, including means, t-statistics, degrees of freedom, and p-value.

returns and were substantially more likely to report that operating expenses were the most important factor in fund performance.

The most dramatic impact of the Fees instruction was on the subjects' self-reported identification of the most important criterion in their selection among the investment alternatives. In both subject pools, the instruction caused a significant reduction in subjects reporting diversification as the most important consideration, and a corresponding increase in the percentage of subjects reporting that fees were the most important consideration. Notably, the fee instruction appeared to be new information to the MTurk subjects as well as the Wharton students despite the fact that the MTurk subjects were significantly more experienced investors, with over half reporting that they have a retirement account.

Table 6. Beliefs and preferences by condition, WBL subjects

	Fee Group Mean	Control Group Mean	T	Df	p
Fees do not affect returns	3.04	3.53	1.97	129.99	.051
Operating expenses most important in performance	4.31	3.16	4.38	129.35	.000
Most important is fees	27.8%	6.7%	3.39	114.67	.001
Most important is diversity	30.6%	53.3%	2.68	121.53	.008

Table 7. Beliefs and preferences by condition, MTurk subjects

	Fee Group Mean	Control Group Mean	T	Df	p
Fees do not affect returns	2.61	3.48	3.43	124.22	.001
Operating expenses most important in performance	4.28	3.25	4.75	85.95	.000
Most important is fees	35.9%	4.6%	4.75	85.95	.000
Most important is diversity	31.3%	50.8%	2.27	126.55	.024

3. Fund Selection

Because our experiment required our subjects to make an investment decision, the effect of the Fees instruction on that decision is arguably the most important component of our experiment. It is arguably also the most important aspect of our study with respect to real-world policy choices in that it measures the potential ability of an instruction to affect investor behavior rather than simply attitudes or beliefs. Because of the importance of this question, we designed our study to measure potential effects in several ways. Results are summarized in Table 8 (WBL) and Table 9 (MTurk).

First, for each subject, we determined the asset-weighted average mutual fund fee that the subject's account would have paid at the time of the subject's investment allocation.¹⁴³ For example, a subject who invested half of his or her money in a fund with a .1% fee and half in the fund with a 2.1% fee had an average fund fee of 1.1%. By this measure, the fee instruction had a clear impact. In both pools, subjects in the Fees group selected portfolios charging a lower average fee than subjects in the control group. Perhaps more importantly, the average fee difference between conditions was significant even when we look only at fees paid on equity funds (Funds 5-10).

¹⁴³ Differences in fund performance would cause the average fee to vary over the thirty years of the simulation.

The fee instruction also affected the subjects' choices among specific investment alternatives. The Fees group invested a higher percentage of their portfolio in the lowest-fee fund option and a lower percentage of their portfolio in the highest-fee fund than the control group (though the latter difference is not significant in the MTurk group). They also invested more in index funds and less in managed funds than their Control counterparts. Notably, those in the Fees group invested more in the lower-fee index fund than those in the control group, but did not invest more in the higher-fee index fund than those in the control group, suggesting that their investment shift resulted from a concern about fees rather than a preference for passively over actively managed funds.

Table 8. Fund selection by condition, WBL

	Fee Group Mean	Control Group Mean	T	Df	p
Average Total Fees Paid (asset-weighted)	.66%	.80%	3.27	129.50	.001
Average Fees Paid in Equity (asset-weighted)	.70%	.84%	2.61	129.77	.010
Index Funds (5-6)	34.12	25.55	2.70	129.77	.008
Managed Funds (7-10)	40.81	48.40	2.46	129.90	.015
Fixed income funds (3-4)	13.76	16.58	1.74	129.99	.085
Money Market (1-2)	18.44	16.14	1.17	126.44	.246
Average Percent of Portfolio Invested in Lowest-Fee Fund	23.5	15.7	3.18	119.20	.002
Average Percent of Portfolio Invested in Highest-Fee Fund	7.15	11.42	2.31	115.34	.022

Table 9. Fund selection by condition, MTurk

	Fee Group Mean	Control Group Mean	T	Df	p
Average Total Fees Paid (asset-weighted)	.68%	.79%	2.21	125.60	.028
Average Fees Paid in Equity (asset-weighted)	.70%	.84%	2.32	124.29	.023
Index Funds (5-6)	29.76	22.45	2.01	118.4	.047
Managed Funds (7-10)	38.65	46.85	1.93	120.41	.056
Fixed income funds (3-4)	12.38	13.82	1.20	126.97	.232
Money Market funds (1-2)	19.21	15.88	1.11	112.47	.268
Average Percent of Portfolio Invested in Lowest-Fee Fund	21.1%	13.9%	2.17	115.94	.032
Average Percent of Portfolio Invested in Highest-Fee Fund	7.55%	10.42%	1.38	126.08	.170

D. Diversification

Finally, we considered the extent to which the fee instruction affected the propensity of the subjects to engage in a naïve diversification strategy. Table 10 compares the concentration of funds by condition, using a concentration measure based on each fund's Euclidean distance from the perfectly even distribution.¹⁴⁴ This concentration measure assesses the degree to which a subject's portfolio differed from the naïve $1/n$ investment strategy.¹⁴⁵

¹⁴⁴ See Beshears, et al., *supra* note __. Concentration is measured by the square root of the sum of the squared differences between the actual allocations and the even distribution (.10, .10, .10, .10, .10, .10, .10, .10, .10). The most diversified portfolio would be zero, and the most concentrated portfolio (100% in one fund, 0 in 9 funds) is .949.

¹⁴⁵ We also measured diversification using the Herfindahl-Hirschman index, typically employed to measure the concentration of market power in an industry, which simply

The results here illustrate most dramatically the limitations of our Fees instruction. For both subject pools, subjects in the Fees group had more concentrated portfolios than those in the control group – that is, their portfolios looked less like the paradigmatic naïvely diversified allocation. However, even though both groups’ allocations were more concentrated, subjects did not actually invest in significantly fewer total funds. MTurk subjects invested a positive amount in a median of 6 total funds, and the median for WBL subjects was even higher, at 8 total funds. In both cases, the mean number of funds invested is slightly lower for the Fees group than for the control group, but not significantly so. In addition, although subjects responded to the instruction by reducing their allocations to high fee funds, they did not shift out of high fee funds entirely.

Table 10. Concentration of investments, by condition, for both subject pools

	Fee Group Mean	Control Group Mean	T	Df	p
Concentration: WBL	.333	.287	1.98	128.47	.050
Concentration: Amazon Turk	.376	.315	1.75	122.78	.082

E. Robustness: Subjects with Investment Experience

In our last analysis, we consider how the fee instruction affected a particular sub-group of subjects who we predict would be less in need of investor education. Because the Amazon Turk subjects were not primarily drawn from a student population, we looked at some experimental effects on the sub-group of the sample who had investment experience. Of the 197 MTurk subjects, 54.8% reported that they had a retirement account for which they made investment decisions. Noting at the outset that tests of the experimental manipulation on this sub-group are less powerful because the sample size is smaller, we found that the fee instruction affected decision-making even when investors were not entirely new to investing.

sums the squared percentage allocated to each fund. This measure also yielded statistically significant differences in concentration by condition, at $p=.028$ for the WBL subject pool and $p=.067$ for the Turk pool.

Looking only at experienced investors, the fee instruction increased subjects' clicks on fee links from 3.9 to 8.7 clicks ($t=3.14$, $df=58.12$, $p=.003$). Those who saw the fee instruction paid a significantly lower total fee (.63% vs. .75%) than those in the control group ($t=2.13$, $df=71.00$, $p=.037$). The instruction made subjects invest slightly, though not significantly, more in the lowest-fee fund ($p=.237$) and slightly less in the highest-fee fund (mean difference=3.8%, $t=1.85$, $df=64.16$, $p=.069$). Experienced subjects in the Fee group were also much more likely to report that the most important consideration was operating expenses compared with experienced subjects in the control group (percent difference=30.8, $t=3.46$, $df=48.84$, $p=.001$).

V. IMPLICATIONS AND NEXT STEPS

This study constitutes preliminary research. Consequently, our ability to generalize from our results is limited. As noted above, our study contained a number of simplifications and design choices that we will investigate further through additional research.

In particular, we deliberately designed our study, in contrast to other experimental studies (and the real world of investing), to make fee information simple, accessible and comparable. Our simplification was designed to enable us to differentiate between a cognitive failure -- the inability to understand fee information -- and a motivational failure -- indifference to fees even when they are clear and available. Our results suggest that subjects who are not motivated to seek and use fee information will fail to do so, even when cognitive barriers are minimal.

The simplification of fee information, in the absence of a Fees instruction, appeared to be of limited value. Without the fee instruction, our subjects tended to diversify among the investment options provided, to pay average fees, and to obtain average performance from their investments. This suggests that the SEC's emphasis on improving disclosure, at least in the absence of improved investor education, may be misplaced.

Our interpretation of these results is that investor ignorance of the economic significance of mutual fund fees limits their reliance on fee information in choosing among investment alternatives. Mutual fund fees are presented in fractions of a percent, and investors may assume

that the real cost of such fees is negligible.¹⁴⁶ Our study predicts that, if investors are instructed about the importance of fees, they will be more attentive to fees in choosing among funds.

In a small follow-up study we explored the extent to which inattention to fees might be the result of limited investor financial literacy. In a 2-minute questionnaire, subjects were asked to estimate the difference between two 30-year investments of \$10,000 with an average (before fees) rate of return of 8%, one with a 1% fee and the other with a 2% fee.¹⁴⁷ The correct answer is approximately \$20,000. The median response was \$3,000, and almost 40% of subjects underestimated the effect of the fee by an order of magnitude. This is a very rough way to picture how individuals approach the complex compound interest problem. Nonetheless, it supports a possible explanation for why investors do not change their behavior in response to simplified fee information: they do not think that fees, which seem very small, will have big effects on funds' returns.

Limited investor understanding of the magnitude of the fee impact may also explain why our subjects' response to the Fees instruction was limited. Although the instruction stated that fees were important, it neither told investors why nor quantified the effect of a small fee differential. Even if investors are told that fees matter, our small study suggests that they may under-estimate the importance of small fee differences. A more explicit instruction, such as one indicating that the choice between funds with small differences in fees can, over the life of a retirement account by as much as 35% may have a greater effect on investor behavior. We intend, through future research, to experiment

¹⁴⁶ Such an assumption is, of course, mistaken. An investor who invests \$10,000 in a retirement account that earns an 8% return (before fees) for thirty years and that charges a .5% fee will have more than \$85,000 in retirement savings. If the fees are 2% instead, that same account will be worth less than \$55,000.

¹⁴⁷ The study was a short survey on Amazon Turk. 185 subjects were paid \$.75 and half received a bonus of a \$.25 bonus for above-average accuracy. Before seeing the main question, they were told, "[w]hen you buy shares of a mutual fund, as many people do when they choose a retirement portfolio, a percentage of the investment goes toward the mutual fund's annual operating expenses – in other words, mutual funds charge investors a yearly fee which is automatically deducted from investor accounts. In this task, you are being asked to estimate the total cost of a mutual fund's fees over a long time period." They were instructed to answer the question quickly, without using a calculator.

with varying the nature of the fee instruction in order to determine whether we can thereby improve its effectiveness.¹⁴⁸

Our findings about the extent of diversification seem to confirm a high degree of naïve diversification, consistent with the literature. We are particularly troubled by the frequency with which investors allocate money to both members of a pair-wise set of funds in which one alternative is objectively inferior to the other. Our findings suggest that an employer's burden in designing an appropriate 401(k) plan may be particularly difficult because the inclusion of even a few poor or more costly investment choices in a plan can harm investors who are unable to identify and eliminate such funds. They also suggest that investors do not truly understand the objective of diversification. Here, as with fees, we intend to explore the extent to which information and instructions can improve the quality of investor decisions.

Our results with respect to both fees and diversification raise broader questions about the extent to which retail investors truly understand the investment process. Efficient retirement investing demands that investors understand basic principles of costs and diversification, but also the effect of compounding, the value of asset allocation and the consequences of these choices for investing over a thirty-year (or more) time horizon. Our next study will focus to a larger degree on investor cognition in an effort to distinguish between investors' failure to set appropriate objectives from their inability to meet their objectives.

Our study raises particular concern that investors (and employers as well) do not understand what they are supposed to do in investing for retirement. Given our subjects' expressed levels of discomfort with the investment process, we predict that, rather than attempting to understand these concepts, investors search for short-cuts, heuristics and opportunities to delegate. Indeed, studies show that an increasing number of retirement investors attempt to delegate their investment decisions by choosing actively managed mutual funds, target-date funds or professionally managed accounts.¹⁴⁹ Delegating responsibility for

¹⁴⁸ Compare Mercer et al., *supra* note __ (conducting an experiment to vary the strength of performance disclaimer and finding that stronger disclaimers were more effective).

¹⁴⁹ See *More 401(k) Participants Turning to Professionals for Help*, Financial Planning, (June 27, 2012), <http://www.financial-planning.com/news/more-401k-participants-turning-to-professional-for-help-vanguard-says-2679595-1.html> (stating that more than one third of Vanguard's 401(k) plan

investment decisions makes investors vulnerable to the choices of professionals, choices that may be opaque, shielded from market discipline or tainted by conflicts of interest.

The popularity of target-date funds in 401(k) plans is one example. Target-date funds provide investors with a gradual shift from equity to fixed income as the investor nears retirement age, thereby relieving investors of the burden of determining how to allocate their assets appropriately.¹⁵⁰ When the financial crisis hit, investors learned that different target-date funds had widely varied approaches to asset allocation and were far riskier than investors had believed.¹⁵¹ Similarly, target-date funds vary substantially in fees and complexity – one article reports that that fees range from less than .2% to more than 1%.¹⁵² Existing regulatory provisions encourage employees to invest in target-date funds, but our analysis suggests that, because these funds may purport to relieve investors of the need to evaluate costs and risks, employer obligations to screen such choices more carefully be greater.

Our study has important implications for plan design. Courts and commentators, such as the *Wal-Mart* court suggest that retirement plan design should focus on offering employees a broad array choices that include several low cost options. If, however, if investors do not avoid inferior investment options, the inclusion of such options may be problematic. In addition, the menu of options offered may influence investors' allocations, cause investors to select too many funds, or paralyze investors altogether.

Finally, the limited attention our subjects paid to fund fees casts doubt on the claim, as reflected in Judge Easterbrook's opinion in *Jones*, that market competition renders judicial oversight of fees unnecessary.

participants turned their accounts over to professional money managers); Elizabeth O'Brien, *10 Things 401(k) Plans Won't Tell You*, MARKETWATCH (reporting that employees invest almost three times as much money in actively managed equity funds as index funds, despite the higher cost of actively managed funds).

¹⁵⁰ Gwendolyn A. Williamson, *Retirement Product Disclosure Rules and the Impact on Mutual Fund Distribution*, 19 INVESTMENT LAWYER (Oct. 2012).

¹⁵¹ *Id.* These concerns led the SEC to develop a rule-making proposal for target-date funds. See PROPOSED RULE, INVESTMENT COMPANY ADVERTISING: TARGET DATE RETIREMENT FUND NAMES AND MARKETING, SEC Release Nos. 33-9126; 34-62300; IC-29301; File No. S7-12-10 (June 16, 2010); (75 FR 35920 (June 23, 2010)), www.sec.gov/rules/proposed/2010/33-9126.pdf.

¹⁵² Pat Regnier, *Three Things to Know About Target-Date Funds*, CNNMONEY (July 31, 2012).

The relative insensitivity of investors to economically important fee differences suggests a market failure and one that cannot readily be addressed by the SEC's current focus on expanded disclosure.

CONCLUSION

Many studies have identified biases or mistakes in consumers' real-world investment decisions. Regulatory changes that have increased individual consumer responsibility for retirement savings and investment choices magnify the consequences of these mistakes. The extent to which disclosures, investor education, or other strategies can address these mistakes is of critical policy concern.

We constructed an experiment designed to inform the process of regulatory design by developing a greater understanding of investor decision-making behavior. The study has important implications for future regulatory policy. First, our results contribute evidence that investor choice, without more, does little to protect investors or to produce efficient investment decisions. Second, our study casts doubt on the claim that poor investor decisions are the result of lengthy or confusing disclosure documents and suggests that simplified disclosure, without more, is unlikely to affect investor behavior significantly. Third, they suggest a research agenda for improving investor literacy.

The experimental manipulation in this study, although modest, affected both investor behavior and beliefs significantly. Our results suggest that offering investor education, even in the form of a simple instruction, can make a big difference.

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