
ARTICLE

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

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INTRODUCTION

Mounting evidence demonstrates 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–Frank² mandate, the Securities & Exchange Commission (SEC) concluded that “American investors lack basic financial literacy.”³ 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.⁴

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.⁵ Unlike traditional pension plans, participant-directed 401(k) plans place the responsibility for critical investment decisions in the hands of employees, who select their own investments from a menu of employer-provided alternatives. This means that low-level employees—individuals with even

¹ See, e.g., Andrea Frazzini & Owen A. Lamont, *Dumb Money: Mutual Fund Flows and the Cross-Section of Stock Returns*, 88 J. FIN. ECON. 299, 319 (2008) (concluding that “individual investors have a striking ability to do the wrong thing”).

² Dodd–Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203, 124 Stat. 1376 (2010) (codified as amended in scattered sections of 7, 12, and 15 U.S.C.).

³ OFFICE OF INVESTOR EDUC. & ADVOCACY, SEC, STAFF STUDY REGARDING FINANCIAL LITERACY AMONG INVESTORS 15 (2012) [hereinafter SEC STAFF STUDY], available at <http://www.sec.gov/news/studies/2012/917-financial-literacy-study-part1.pdf>.

⁴ *Id.*

⁵ See Pamela Perun & Joseph John Valenti, *Defined Benefit Plans: Going, Going, Gone?* 4 & fig.1 (2008), available at <http://planetnow.com/metaPage/lib/Perun-ValentiFinalAppam.pdf> (“In 1975, over 70% of active employees participated in a defined benefit plan. In 2005, the majority of active employees (over 75%) participated in a defined contribution plan instead.”).

less investment knowledge than the general population⁶—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.⁷ Unlike other equity investments, notably stock, mutual funds are held primarily by individual investors.⁸ This market segmentation means that retail fund investors cannot benefit from the market discipline exercised by more sophisticated institutions.⁹

As a result, there are reasons to doubt the efficiency of the mutual fund market and to ask whether the market offers retail investors reasonable and comprehensible investment options. In particular, many commentators are puzzled by the large number of fund choices and by the persistence of high-fee funds that underperform the market.¹⁰

Congress, the 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 investors include mandated disclosure requirements, product limits, and the imposition of fiduciary duties on employers, brokers, and investment advisers. Widespread litigation over the role of judicial oversight of mutual fund fees and the scope of employer obligations in designing retirement plans raises questions about the manner in which individuals make investment decisions. In one such high profile case, Seventh Circuit Judges Richard Posner and Frank Easterbrook, although

⁶ Cf. SEC STAFF STUDY, *supra* note 3, at 15 (“In particular, surveys demonstrate that certain subgroups, including women, African-Americans, Hispanics, the oldest segment of the elderly population, and those who are poorly educated, have an even greater [lack] of investment knowledge than the average general population.”).

⁷ See INV. CO. INST., 2013 INVESTMENT COMPANY FACT BOOK 95 (53d ed. 2013) [hereinafter ICI FACT BOOK], available at http://www.icifactbook.org/pdf/2013_factbook.pdf (stating that, in 2012, seventy-two percent of mutual fund–holding households owned mutual fund shares inside retirement plans).

⁸ See *id.* at 90 (explaining that households owned eighty-nine percent of total mutual fund assets as of the end of 2012). Institutional use of mutual funds is limited and consists mostly of money market funds, which are used for cash management. See *id.* at 105-06.

⁹ 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 found that retail funds with an institutional twin perform better, which suggests that, in this context, retail investors can benefit from the market discipline imposed by institutions. See generally Richard B. Evans & Rüdiger Fahlenbrach, *Institutional Investors and Mutual Fund Governance: Evidence from Retail–Institutional Fund Twins*, 25 REV. FIN. STUD. 3530 (2012).

¹⁰ See, e.g., PETER J. WALLISON & ROBERT E. LITAN, *COMPETITIVE EQUITY: A BETTER WAY TO ORGANIZE MUTUAL FUNDS* 8-9 (2007) (observing that the mutual fund industry “does not appear to conform to the ‘law of one price’”).

reaching opposite conclusions about investor behavior, each suggested that the manner in which such decisions are made is critical to evaluating the appropriate level of regulatory intervention.¹¹

The importance of understanding investor behavior is not limited to the litigation context. With employees' increasing dependence on their 401(k) plans to deliver retirement income, employers are rethinking issues such as plan structure and the choice of investment options.¹² BrightScope's highly publicized online ratings and rankings of 401(k) plans have heightened employer attention to the importance of plan design.¹³

Congress has recently acknowledged the need for a better understanding of investor behavior. In the Dodd–Frank Act, Congress instructed the SEC to conduct a study of investor financial literacy.¹⁴ The SEC's study was conducted at the most superficial level, however, and provided limited insight into developing future regulatory policy.¹⁵ Although the SEC found investor mistakes and misconceptions, it did not seek to identify the reasons for these mistakes or to understand the underlying mechanisms driving investor choices.¹⁶

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

¹¹ Compare *Jones v. Harris Assocs. L.P.*, 527 F.3d 627, 631-32 (7th Cir. 2008) (Easterbrook, J.) (reasoning that market discipline should constrain excessive mutual fund fees by driving investors away from costly funds), with *Jones v. Harris Assocs. L.P.*, 537 F.3d 728, 731-32 (7th Cir. 2008) (Posner, J., dissenting) (questioning whether high fees actually drive investors away), *denying reh'g en banc to 527 F.3d 627*. The Supreme Court vacated the Seventh Circuit decision without resolving the question. See *Jones v. Harris Assocs. L.P.*, 130 S. Ct. 1418, 1430-31 (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.”).

¹² See, e.g., AON HEWITT, 2011 TRENDS & EXPERIENCE IN DEFINED CONTRIBUTION PLANS: PAVING THE ROAD TO RETIREMENT (2011), available at http://www.aon.com/attachments/thought-leadership/2011_Trends_Experience_Executive_Summary_v5.pdf (explaining emerging trends in plan design and administration).

¹³ See, e.g., Ron Lieber, *Spotlighting 401(k) Plans, Thanklessly*, N.Y. TIMES, Sept. 17, 2011, at B1 (describing attention received by BrightScope ratings and criticisms of its methodology); Christine P. Roberts, *Your 401(k) Plan's Online Report Card—and What to Do About It*, E IS FOR ERISA (Oct. 5, 2011, 7:49 PM), <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).

¹⁴ Dodd–Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203, § 917, 124 Stat. 1376, 1836 (2010).

¹⁵ See generally SEC STAFF STUDY, *supra* note 3.

¹⁶ See *id.* at iii-vii.

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 decisionmaking 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, 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 that excessive and naïve diversification strategies are driving many investment decisions.

Our findings are concededly preliminary. More important, because of the simplified nature of our experiment, our results may not fully explain real-world investment decisions, in which the stakes and the cost of gathering and evaluating investment information are much higher. 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 decisionmaking 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.¹⁷ 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 (NAV).¹⁸

At the end of 2012, there were over 7596 mutual funds in the United States.¹⁹ Mutual funds are typically categorized according to the types of assets in which they invest. These include funds that invest primarily in equity, funds confined to fixed income investments, and hybrid funds that combine the two. Funds may be 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, like energy stocks or pharmaceuticals; others invest in specific asset classes, like 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.²⁰

Mutual funds do not typically hire employees to make investment decisions or perform administrative services.²¹ 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

¹⁷ See ICI FACT BOOK, *supra* note 7, at 90 (noting that "53.8 million households, or 44 percent of all U.S. households, owned mutual funds" in 2012). The global economic importance of mutual funds is even greater. The Investment Company Institute reported 73,243 mutual funds worldwide, holding almost \$27 trillion in assets at the end of 2012. *Id.* at 201 tbl.61, 202 tbl.62.

¹⁸ For a general description of mutual funds, see Jill E. Fisch, *Rethinking the Regulation of Securities Intermediaries*, 158 U. PA. L. REV. 1961, 1967-75 (2010).

¹⁹ ICI FACT BOOK, *supra* note 7, at 142 tbl.1. In addition to funds, there were over 1194 exchange-traded funds (ETF) as of the end of 2012. *Id.* at 155 tbl.14. ETFs differ from mutual funds on several key features—including the manner in which they trade—but offer investors a similar type of diversified investment. See Fisch, *supra* note 18, at 1978-82.

²⁰ Target date funds are often used for retirement investing. See Fisch, *supra* note 18, at 2022-24.

²¹ 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) ("The typical mutual fund is a rudimentary legal vessel into which shareholders contribute money and over which a board of trustees governs; the fund has no offices, no equipment, and no employees.").

fees, distribution (12b-1) fees, and administrative expenses.²² Of these fees, the largest are management fees, which are paid to the funds' investment advisers. 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.²³ The complexity of fund fee structures makes it difficult to calculate costs or compare different funds.²⁴

As of 2012, forty-four percent of U.S. households, or 53.8 million households, owned mutual funds.²⁵ Mutual fund investing is not limited to wealthy or sophisticated retail investors; to the contrary, in 2012, most mutual fund-owning households had incomes of less than \$100,000.²⁶ The relative lack of sophistication among mutual fund investors has led Congress and the SEC to regulate mutual funds strictly.

The SEC oversees the operation of mutual funds, which are regulated by the Investment Company Act of 1940 (ICA).²⁷ Among the regulations imposed on mutual funds are extensive disclosure requirements, including disclosure of a fund's investment objectives, costs, investment strategies, and advisers.²⁸ Funds are restricted in their investments, in their use of leverage, and in the manner in which they compensate their investment advisers.²⁹ The ICA also requires mutual funds to have a board of directors, at least forty percent of whom must be independent of the fund's investment

²² OFFICE OF INVESTOR EDUC. & ADVOCACY, SEC, MUTUAL FUNDS: A GUIDE FOR INVESTORS 12-15 (2007), available at <http://www.sec.gov/investor/pubs/sec-guide-to-mutual-funds.pdf>.

²³ Fisch, *supra* note 18 at 1996-98.

²⁴ As one commentator has observed, 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, 283 (2009).

²⁵ ICI FACT BOOK, *supra* note 7, at 90. Mutual fund ownership has increased dramatically over the past thirty years. In 1980, less than six percent of U.S. households owned mutual funds. *Id.*

²⁶ *Id.* at 94. Only thirty-nine percent of mutual fund-owning households had incomes over \$100,000, and the median income for mutual fund-holding households was \$80,000. *Id.*

²⁷ 15 U.S.C. §§ 80a-1 to -64 (2006 & Supp. V 2012).

²⁸ Fisch, *supra* note 18, at 1968-69.

²⁹ *Id.* at 1970-72.

adviser.³⁰ Finally, the ICA requires a fund's shareholders to elect the directors and to approve certain structural changes.³¹

The extensive regulation of mutual funds is a direct response to concerns about investor exploitation and the inability of market forces to protect investors adequately. According to SEC estimates, investors in mutual funds lost forty percent of their investments between 1929 and 1936.³² 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.³³ The ICA was Congress's response to that problem.³⁴

Nevertheless, 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 protection against excessive costs.³⁵ The SEC noted that the problem was exacerbated by the fact that mutual funds were sold primarily to "family m[e]n of moderate income."³⁶ In response, the SEC recommended that the ICA be amended to limit investment advisers to a "reasonable" fee for their management services and "that this standard be enforceable in the courts."³⁷

Congress adopted the SEC's recommendation and included § 36(b) in the 1970 revisions to the ICA. Section 36(b) 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

³⁰ *Id.* at 1967. 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 in scattered parts of 17 C.F.R.).

³¹ 15 U.S.C. §§ 80a-13 & -16. Unlike operating companies, mutual funds need not provide annual meetings for the election of directors.

³² Paul Roye, Dir., Div. of Inv. Mgmt., SEC, Opening Remarks at a Celebration of the 60th Anniversary of the Investment Company Act (Oct. 4, 2000), available at www.sec.gov/news/speech/spch405.htm.

³³ *Id.*

³⁴ *Id.*

³⁵ *See* SEC, PUBLIC POLICY IMPLICATIONS OF INVESTMENT COMPANY GROWTH, H.R. REP. NO. 89-2337, at viii (2d Sess. 1966) ("[M]utual fund shareholders need protection against incurring excessive costs in the acquisition and management of their investments and . . . , 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 [ICA] presently provide this protection in adequate measure.")

³⁶ *Id.* at ix.

³⁷ *Id.* at viii.

duty.³⁸ 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.³⁹ Nonetheless, mutual fund fees continue to vary significantly. The New York Times reports, based on data from the Investment Company Institute, that the average expense ratio for equity mutual funds is 1.44%,⁴⁰ but fees range from 0.05%⁴¹ to more than 2%.⁴²

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.⁴³ To date, no court has held an adviser liable in so-called “§ 36(b)” litigation,⁴⁴ but one commentator estimates that the defense and settlement of these lawsuits cost the mutual fund industry about \$400 million per year.⁴⁵ 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 Associates L.P.*⁴⁶ The panel majority in *Jones* viewed extensive judicial oversight of 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.”⁴⁷ 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 the denial of

³⁸ Investment Company Amendments Act of 1970, § 20, Pub. L. No. 91-547, 84 Stat. 1413, 1428-30 (1970) (codified as amended at 15 U.S.C. § 80a-35(b) (2012)); see also *Jones v. Harris Assocs. L.P.*, 130 S. Ct. 1418, 1423 (2010).

³⁹ ICI FACT BOOK, *supra* note 7, at 75-76.

⁴⁰ Anna Bernasek, *What a Difference a Percentage Point Can Make*, N.Y. TIMES, Oct. 7, 2012, at BU18.

⁴¹ See, e.g., *Vanguard 500 Index Fund Admiral Shares*, VANGUARD, <https://personal.vanguard.com/us/funds/snapshot?FundId=0540&FundIntExt=INT> (last visited Jan. 24, 2014) (reporting the expense ratio as of April 12, 2013, for those investing a minimum of \$10,000).

⁴² See, e.g., *AllianceBernstein Blended Style Funds Tax-Managed International Portfolio*, ALLIANCE BERNSTEIN, https://www.alliancebernstein.com/abcom/Product_Center/3_Vehicle/MF/Equity/Core/Tax-Mgd_International_Portfolio.htm?+=performance (last visited Jan. 24, 2014) (click “Performance” tab) (reporting net and gross expense ratios of 2.40% as of January 31, 2013).

⁴³ See M. Todd Henderson, *Justifying Jones*, 77 U. CHI. L. REV. 1027, 1033 (2010) (finding that more than 100 lawsuits have been filed since 1970, when the ICA was amended to provide a private right of action under § 36(b)); Quinn Curtis & John Morley, *An Empirical Study of Mutual Fund Excessive Fee Litigation: Do the Merits Matter?*, 30 J.L. ECON. & ORG. (forthcoming 2014) (manuscript at 2), available at <http://ssrn.com/abstract=1852652> (reporting, from 2000 to 2009, ninety-one investor suits against mutual fund advisers alleging excessive fees).

⁴⁴ Henderson, *supra* note 43, at 1033.

⁴⁵ *Id.* at 1043.

⁴⁶ 527 F.3d 627 (7th Cir.), *reh’g denied*, 537 F.3d 728 (7th Cir. 2008) (en banc), and *vacated and remanded*, 130 S. Ct. 1418 (2010).

⁴⁷ *Id.* at 634.

the petition for rehearing en banc, the court's reasoning raised an important empirical question: "[W]ill high fees drive investors away?"⁴⁸

The Supreme Court in *Jones* 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.⁴⁹ Empirical studies have begun to try to answer this question, and the study we report in Part III adds to that growing literature.

B. 401(k) Plans

Courts and policymakers are increasingly concerned with mutual fund investment decisionmaking, because mutual funds are the primary vehicle for employee retirement savings. Over the past forty years, employee retirement savings plans⁵⁰ have largely shifted from defined benefit pension plans⁵¹ to defined contribution plans⁵²—primarily 401(k) plans.⁵³ This shift has transferred responsibility for investment decisions from the employer to individual employees. Although the employees direct the investment of their retirement funds in a 401(k) plan, the employer selects the menu of investment options available, thus limiting the employees' allocations to the choices provided.⁵⁴

So-called "participant control" allows the employer to reduce its liability exposure. Specifically, § 404(c) of the Employee Retirement Income Security Act of 1974 (ERISA) exempts fiduciaries from liability for losses caused by participants' exercise of control over assets in their individual

⁴⁸ 537 F.3d at 731 (Posner, J., dissenting).

⁴⁹ Larry E. Ribstein, *Federal Misgovernance of Mutual Funds*, 2009–2010 CATO SUP. CT. REV. 301, 316. The Supreme Court did not attempt to resolve this question. See *Jones*, 130 S. Ct. at 1430–31 ("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.").

⁵⁰ Employee retirement plans are regulated by the Employee Retirement Income Security Act of 1974 (ERISA), 29 U.S.C. §§ 1001–1461 (2006 & Supp. V 2012).

⁵¹ Defined benefit plans, the category encompassing most traditional pension plans, "generally 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).

⁵² 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.*

⁵³ See *id.* at 255 ("Defined contribution plans dominate the retirement plan scene today."); Edward A. Zelinsky, *The Defined Contribution Paradigm*, 114 YALE L.J. 451, 471 (2004) ("[I]n the years before ERISA, the traditional defined benefit plan was the dominant device for retirement savings.").

⁵⁴ 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).

accounts.⁵⁵ As of February 2012, the Department of Labor estimated that 72 million individuals are covered by 401(k) plans in which individual participants are responsible for directing the investment of their retirement savings.⁵⁶

ERISA does not restrict the types of investments that an employer 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.⁵⁷ In order to obtain the benefit of ERISA's § 404(c) safe harbor, a plan must offer investors at least three "diversified" investment options with "materially different risk and return characteristics."⁵⁸ Most 401(k) plans offer employees substantially more options. According to BrightScope, in 2011, the average 401(k) plan offered employees twenty-four investment options.⁵⁹ Some plans offer hundreds or even thousands of choices.⁶⁰ Approximately half of all 401(k) plan assets are invested in mutual funds.⁶¹

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.⁶² The service provider acts as a trustee for the plan, 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 seventy-seven percent of plans.⁶³ 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 have also found that

⁵⁵ 29 U.S.C. § 1104(c) (2006 & Supp. V 2012); *see also* 29 C.F.R. § 2550.404c-1 (2012).

⁵⁶ EMP. BENEFITS SEC. ADMIN., U.S. DEP'T OF LABOR, FACT SHEET: FINAL RULE TO IMPROVE TRANSPARENCY OF FEES AND EXPENSES TO WORKERS IN 401(K)-TYPE RETIREMENT PLANS (2012), *available at* <http://www.dol.gov/ebsa/pdf/fsparticipantfeerule.pdf>.

⁵⁷ U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-11-291, 401(K) PLANS: CERTAIN INVESTMENT OPTIONS AND PRACTICES THAT MAY RESTRICT WITHDRAWALS NOT WIDELY UNDERSTOOD 8-9 & tbl.1 (2011) [hereinafter 2011 GAO REPORT], *available at* <http://www.gao.gov/assets/320/316437.pdf>.

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

⁵⁹ Jack Hough, *Getting the Most from a Lame 401(k) Retirement Plan*, WALL ST. J., Oct. 8-9, 2011, at B7.

⁶⁰ *See, e.g.,* Hecker v. Deere & Co., 556 F.3d 575, 581 (7th Cir. 2009) (describing Deere & Co.'s plan as offering more than 2500 investment options).

⁶¹ Sarah Holden & David Abbey, *Fortune's Assessment of Industry Stance on 401(k) Fees Is Misguided*, ICI VIEWPOINTS (June 25, 2012), http://www.ici.org/viewpoints/view_12_fortune_401k_fees.

⁶² 2011 GAO REPORT, *supra* note 57, at 6.

⁶³ Veronika K. Pool, Clemens Sialm & Irina Stefanescu, *It Pays to Set the Menu: Mutual Fund Investment Options in 401(k) Plans* 9 (Jan. 20, 2013) (unpublished manuscript), *available at* <http://ssrn.com/abstract=2112263>.

trustees may be less inclined to remove one of their own underperforming funds from the plan menu.⁶⁴

Service providers charge various types of fees to 401(k) plan sponsors in connection with the provision of administrative services.⁶⁵ Both the amount and type of fee can vary dramatically among providers.⁶⁶ A substantial percentage of plans pass through all or part of fees charged by their service providers to plan participants.⁶⁷ 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,⁶⁸ and sponsor contracts with service providers typically give the sponsor authority for the selection of investment options in the plan.⁶⁹ As a fiduciary, the sponsor is required to select and periodically evaluate the plan's mix and range of investment options.⁷⁰ In determining whether the sponsor has adhered to its obligations, courts have considered "the range of investment options and the characteristics of those included options—including the risk profiles, investment strategies, and associated fees."⁷¹

Commentators have debated what these fiduciary obligations mean, specifically the extent to which they may require sponsors to choose the lowest-cost mutual fund options.⁷² Commentators have also debated the extent to

⁶⁴ *Id.* at 1-2, 5, 29-30.

⁶⁵ In response to a U.S. Government Accountability Office (GAO) study finding that many plan sponsors did not know or understand the fees charged by their plans, the Department of Labor adopted new regulations, effective in July 2012, requiring detailed fee disclosure from service providers to plan sponsors. 29 C.F.R. § 2550.408b-2(c)(1) (2012); *see also* GAO, GAO-12-325, 401(K) PLANS: INCREASED EDUCATIONAL OUTREACH AND BROADER OVERSIGHT MAY HELP REDUCE PLAN FEES 24-28, 44, 48 (2012) [hereinafter 2012 GAO REPORT], available at <http://www.gao.gov/assets/600/590359.pdf> (describing employers' limited awareness and understanding of plan fees); Mary Beth Franklin, *New Fee Disclosure Rules Could Shake Up 401(k) World*, INVESTMENTNEWS (June 24, 2012), <http://www.investmentnews.com/article/20120624/REG/306249994> (describing new disclosure requirements and predicting their effect). The regulations also required that service providers disclose fee information to plan participants. 29 CFR § 2550.408b-2(c)(1)(iv)-(vi).

⁶⁶ *See* 2012 GAO REPORT, *supra* note 65, at 7-10.

⁶⁷ *See id.* at 16-18, 21.

⁶⁸ *See* 29 U.S.C. § 1104(a)(1) (2006) (assigning sponsors the fiduciary duty to, *inter alia*, "diversify[] the investments of the plan so as to minimize the risk of large losses").

⁶⁹ *See, e.g., Renfro v. Unisys Corp.*, 671 F.3d 314, 323 (3d Cir. 2011) (explaining that, under its contract with the defendant, service provider Fidelity had "no contractual authority to control the mix and range of investment opinions").

⁷⁰ *Id.* at 326.

⁷¹ *Id.* at 327.

⁷² *See* Christopher Carosa, *401k Plan Sponsors and the Mutual Fund Expense Ratio Wild Goose Chase*, FIDUCIARY NEWS (July 3, 2012), <http://www.fiduciarynews.com/2012/07/401k-plan->

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,⁷³ others dispute those claims.⁷⁴

With the formation of BrightScope in 2009, employers have faced increasing public scrutiny of their 401(k) plans.⁷⁵ 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 online ratings and rankings.⁷⁶ 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.⁷⁷ 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.⁷⁸ BrightScope does, however, analyze investment menu quality.⁷⁹ The BrightScope ratings have generated substantial publicity and have caused many employers to rethink the structure of their plans.⁸⁰

sponsors-and-the-mutual-fund-expense-ratio-wild-goose-chase ("The [Department of Labor] has been careful to warn plan sponsors not to merely go to the lowest cost provider.").

⁷³ See, e.g., Scott Cendrowski, *The 401(k) Fee Revolution*, FORTUNE, July 2, 2012, at 66 (arguing that many 401(k) plans are not competitively priced).

⁷⁴ See, e.g., Holden & Abbey, *supra* note 61 (arguing that 401(k) fees pay for services that are valuable to participants).

⁷⁵ See Lieber, *supra* note 13, at B1, B5 (describing BrightScope's formation and its retirement plan rating services).

⁷⁶ *Id.*

⁷⁷ See *Frequently Asked Questions, Data and Methodology: What Is a BrightScope Rating?*, BRIGHTSCOPE, <http://www.brightscope.com/faq/401k-retirement/#WhatRating> (last visited Jan. 24, 2014).

⁷⁸ See, e.g., Amy Feldman, *How Good Is Your 401(k)?*, BLOOMBERG BUSINESSWEEK (Dec. 30, 2009), http://www.businessweek.com/magazine/content/10_02/b4162060137562.htm ("BrightScope's list of top 401(k) plans is dominated by industries . . . where the workforce is well-paid and stable."); Steve Utkus, *Rating Your 401(k)*, VANGUARD BLOG (March 15, 2010), <http://www.vanguardblog.com/2010/03/15/rating-your-401k> (noting that higher-paid workers save more and that ratings cannot account for discrepancies in participants' incomes).

⁷⁹ Press Release, BrightScope, BrightScope Announces the Top 25 San Francisco Area-Based Companies with the Best 401k Plans (Sept. 17, 2013), *available at* https://bscp.s3.amazonaws.com/uploads/press_piece_pdfs/2013826_SF_Top_Plans_AtomicFINAL.pdf (last visited Jan. 24, 2014). At least one academic study has highlighted major deficiencies in plan-level investment menus. See Quinn Curtis & Ian Ayres, *Measuring Fiduciary and Investor Losses in 401(k) Plans* (2013) (unpublished working paper), *available at* http://www.law.yale.edu/documents/pdf/cbl/Curtis_Ayres_401kFees%281%29.pdf.

⁸⁰ See Michelle Rafter, *BrightScope Shines a Light on 401(k) Plans*, WORKFORCE (March 10, 2010), <http://www.workforce.com/articles/brightscope-shines-a-light-on-401-k-plans> (reporting that employers are "making adjustments to their retirement plans because of BrightScope").

Courts faced with legal challenges to 401(k) plans have largely focused on whether employers have offered a sufficient number of different investment options, rather than examining the quality of those 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.⁸¹ In many of these cases, 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. Deere & Co.*, 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 Brokerage-Link, which gave participants access to some 2,500 additional funds managed by different companies."⁸² All the funds "were available on the open market for the same fee."⁸³ As the court explained, "[T]he 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."⁸⁴ Similarly, in *Renfro v. Unisys Corp.*, the Third Circuit concluded that an employer met its fiduciary obligations by providing an adequate range and mix of investment options—in the case of Unisys, the plan offered "seventy-three distinct investment options."⁸⁵

In contrast, the court in *Braden v. Wal-Mart Stores, Inc.* refused to dismiss similar allegations concerning Wal-Mart's 401(k) plan.⁸⁶ Braden claimed that Wal-Mart included funds with unreasonably high fees in its 401(k) plan, allegedly due in part to fee-sharing between the funds and

⁸¹ The basis for this litigation stems from the Supreme Court's holding in *LaRue v. DeWolff, Boberg & Assocs.*, 552 U.S. 248, 250, 256 (2008), where the Court stated 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."

⁸² 556 F.3d 575, 578 (7th Cir. 2009).

⁸³ *Id.* at 579.

⁸⁴ *Id.* at 586.

⁸⁵ 671 F.3d 314, 327 (3d Cir. 2011).

⁸⁶ 588 F.3d 585, 598 (8th Cir. 2009).

Merrill Lynch, the plan's trustee.⁸⁷ Braden argued that this resulted in the plan paying \$20 million per year in excessive fees.⁸⁸

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 can be 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.⁸⁹

The court noted, in particular, that the Wal-Mart plan offered a limited number of options, consisting of "ten mutual funds, a common/collective trust, Wal-Mart common stock, and a stable value fund."⁹⁰ Comparing Wal-Mart's plan to Deere & Co.'s plan, which offered its participants access to more than 2500 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."⁹¹

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.⁹²

⁸⁷ *Id.* at 590. 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), <http://www.forbes.com/sites/williambarrett/2011/12/05/walmart-merrill-lynch-agree-to-pay-13-5-million-to-settle-401k-fiduciary-lawsuit>.

⁸⁸ *Wal-Mart*, 588 F.3d at 590.

⁸⁹ *Id.* at 596 (citation omitted).

⁹⁰ *Id.* at 589.

⁹¹ *Id.* at 596 n.6.

⁹² See, e.g., Charles D. Ellis, *Murder on the Orient Express: The Mystery of Underperformance*, 68 FIN. ANALYSTS J., July–Aug. 2012, at 13, 13 (criticizing employers for investing in higher-cost actively managed funds in a futile search for outperformance).

II. THE LITERATURE ON INVESTOR DECISIONMAKING

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.⁹³ Investors lack basic financial literacy, including the ability to understand the effect of compound interest or to construct a diversified portfolio. Our study focuses on a widely reported investor mistake: the willingness to invest in high-fee funds despite 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.⁹⁴ Morningstar's Director of Mutual Fund Research has observed, "If 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."⁹⁵ In one recent study, Michael Cooper, Michael Halling, and Michael Lemmon found that, among the funds in their sample, lower-fee funds outperformed otherwise observably identical higher-fee funds by thirty-two percent.⁹⁶

The literature in this area is extensive, and the results of some studies conflict.⁹⁷ Nonetheless, most studies find that high-fee funds underperform

⁹³ See generally FED. RESEARCH DIV., LIBRARY OF CONGRESS, BEHAVIORAL PATTERNS AND PITFALLS OF U.S. INVESTORS (2010) (summarizing economic studies of investor mistakes).

⁹⁴ See Fisch, *supra* note 18, at 1993 (summarizing studies showing that "the most consistent predictor of a fund's return to investors is the fund's expense ratio").

⁹⁵ Russel Kinnel, *How Expense Ratios and Star Ratings Predict Success*, MORNINGSTAR (Aug. 9, 2010), <http://news.morningstar.com/ARTICLENET/ARTICLE.ASPX?id=347327>. 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 the expense ratio alone was a better predictor of future fund performance than the star ratings in a majority of the years analyzed. *Id.*

⁹⁶ Michael Cooper, Michael Halling & Michael Lemmon, *Violations of the Law of One Fee in the Mutual Fund Industry 14-15* (Mar. 28, 2013) (unpublished working paper), available at <http://ssrn.com/abstract=1456079>.

⁹⁷ See Martijn Cremers et al., *The Mutual Fund Industry Worldwide: Explicit and Closet Indexing, Fees, and Performance 1* (Sept. 2013), available at <http://ssrn.com/abstract=1830207> (surveying the conflicting literature regarding the relative value of passive versus active management of equity funds).

both their lower-fee competitors⁹⁸ and passively managed index funds that provide a market rate of return.⁹⁹ Although there is evidence that *some* managers have superior stock-picking ability that persists over time,¹⁰⁰ many studies find that managers are not able to beat the market over the long run.¹⁰¹ Even if some funds consistently outperform the market, the percentage of funds that do so appears to be quite small,¹⁰² 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.¹⁰³ Some investors appear to believe that higher fees are correlated with better performance, in accordance with the adage “you get what you pay for.”¹⁰⁴ Other investors appear to underestimate

⁹⁸ See generally Javier Gil-Bazo & Pablo Ruiz-Verdú, *The Relation Between Price and Performance in the Mutual Fund Industry*, 64 J. FIN. 2153 (2009); John A. Haslem, H. Kent Baker & David M. Smith, *Identification and Performance of Equity Mutual Funds with High Management Fees and Expense Ratios*, 16 J. INVESTING, Summer 2007, at 32; Cooper, Halling & Lemmon, *supra* note 96.

⁹⁹ Martin J. Gruber, *Another Puzzle: The Growth in Actively Managed Mutual Funds*, 51 J. OF FIN. 783, 789-91 (1996).

¹⁰⁰ See K.J. Martijn Cremers & Antti Petajisto, *How Active Is Your Fund Manager? A New Measure That Predicts Performance*, 22 REV. FIN. STUD. 3329 (2009) (finding that the most active funds, as opposed to closet indexers, can outperform their benchmarks net of fees); see also Malcolm Baker et al., *Can Mutual Fund Managers Pick Stocks? Evidence from Their Trades Prior to Earnings Announcements*, 45 J. FIN. & QUANTITATIVE ANALYSIS 1111, 1129-30 (2010) (concluding that mutual fund managers are able to trade profitably in part because they are able to forecast earnings-related fundamentals); Robert Kosowski et al., *Can Mutual Fund “Stars” Really Pick Stocks? New Evidence from a Bootstrap Analysis*, 61 J. FIN. 2551, 2553 (2006) (finding that a sizable minority of managers pick stocks well enough to more than cover their costs).

¹⁰¹ See Nicolas P.B. Bollen & Jeffrey A. Busse, *Short-Term Persistence in Mutual Fund Performance*, 18 REV. FIN. STUD. 569, 594-95 (2004) (“After taking into account transaction costs and taxes, investors may generate superior returns by following a naive buy-and-hold approach rather than a performance-chasing strategy, even if short-term performance is predictable.”); Mark M. Carhart, *On Persistence in Mutual Fund Performance*, 52 J. FIN. 57, 81 (1997) (finding that the best-performing fund managers are “glamorize[d]” and the “mundane explanations of strategy and investment costs account for almost all of the important predictability in mutual fund returns”); Ronald N. Kahn & Andrew Rudd, *Does Historical Performance Predict Future Performance?*, 51 FIN. ANALYSTS J., Nov.–Dec. 1995, at 43, 51 (1995) (finding that “the average underperformance of fixed-income funds more than cancels out the benefits of being able to choose above-average funds through persistence alone”).

¹⁰² See, e.g., Laurent Barras, Olivier Scaillet & Russ Wermers, *False Discoveries in Mutual Fund Performance: Measuring Luck in Estimated Alphas*, 65 J. FIN. 179, 181 (2010) (finding that “the proportion of skilled funds decreases from 14.4% in early 1990 to 0.6% in late 2006”).

¹⁰³ 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 & Henri Servaes, *What Drives Market Share in the Mutual Fund Industry?*, 16 REV. FIN. 81, 110-11 (2012).

¹⁰⁴ See Neil Weinberg, *Fund Manager Knows Best*, FORBES, Oct. 14, 2002, at 220, 220-21 (citing findings that eighty-four percent of investors believe higher-fee funds are better performers).

the economic significance of fund fees.¹⁰⁵ And for others, fees may be presented in a manner that is too complex or difficult to find.¹⁰⁶ As former SEC Chairman Arthur Levitt testified before Congress in 1998, “Our 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.”¹⁰⁷

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.¹⁰⁸ 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.¹⁰⁹ Nonetheless, substantial price dispersion persists in the mutual fund market—price dispersion that does not appear to be explained by product differences.¹¹⁰ One recent study found that, after controlling for fund characteristics, “the average spread in

¹⁰⁵ See John Beshears et al., *How Does Simplified Disclosure Affect Individuals’ Mutual Funds Choices?* (finding that their “subjects’ portfolio choices do not respond sensibly to loads and redemption fees”), in *EXPLORATIONS IN THE ECONOMICS OF AGING* 75, 76 (David A. Wise ed., 2011). One recent study finds that investors overwhelmingly rely on funds’ past performance rather than cost information, and they select funds with high past performance even when cost information is completely omitted. See Beth A. Pontari, Andrea J.S. Stanaland & Tom Smythe, *Regulating Information Disclosure in Mutual Fund Advertising in the United States: Will Consumers Utilize Cost Information?*, 32 J. CONSUMER POL’Y 333, 333-34 (2009).

¹⁰⁶ See, e.g., Brad M. Barber, Terrance Odean & Lu Zheng, *Out of Sight, Out of Mind: The Effects of Expenses on Mutual Fund Flows*, 78 J. BUS. 2095, 2117 (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* 35 (May 14 2013) (unpublished working paper), available at <http://ssrn.com/abstract=2021957> (finding that investors with high IQs tend to avoid higher-fee funds). But see James J. Choi, David Laibson & Brigitte C. Madrian, *Why Does the Law of One Price Fail? An Experiment on Index Mutual Funds*, 23 REV. FIN. STUD. 1405, 1430 (2010) (finding that almost none of the subjects minimized fees despite reporting the importance of fees, and that minimizing search costs only modestly improved portfolio allocations).

¹⁰⁷ *Improving Price Competition for Mutual Funds and Bonds, Hearing Before the Subcomm. on Fin. And Hazardous Materials of the H. Comm. on Commerce*, 105th Cong. 37 (1998) (statement of Hon. Arthur Levitt, Chairman, SEC).

¹⁰⁸ A number of articles argue that the mutual fund market is competitive. See, e.g., Khorana & Servaes, *supra* note 103, at 110 (finding that higher-fee fund families have lower market shares); Sunil Wahal & Albert (Yan) Wang, *Competition Among Mutual Funds*, 99 J. FIN. ECON. 40, 58 (2011) (finding that the mutual fund market, at least after 1998, has been competitive and that the price competition introduced by new entrants reduces management fees).

¹⁰⁹ See Choi, Laibson & Madrian, *supra* note 106, at 1406 (questioning whether demand for nonportfolio services can justify higher fees).

¹¹⁰ See WALLISON & LITAN, *supra* note 10, at 63 (“Despite the fact that the actual services of [mutual] funds are roughly the same, and their performance cannot be considered a significant factor in investor choice, the expense ratios vary widely.”); see also Choi, Laibson & Madrian, *supra* note 106, at 1411 (noting substantial fee variation among index funds that are designed to follow an identical and largely mechanical investment strategy).

residual fees (between the 1st and 99th percentile) across all funds over the sample [was] 2.34%.”¹¹¹ Another study found that, even in the absence of product differences, investors failed to minimize fees.¹¹²

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.”¹¹³ Benartzi and Thaler first demonstrated this phenomenon in a series of experiments in 2001.¹¹⁴ They found that subjects who were 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.¹¹⁵

Research has also demonstrated that investors formulate their asset allocation decisions based on the alternatives provided rather than by independently determining an appropriate allocation.¹¹⁶ This approach has been termed the “menu effect.”¹¹⁷ 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 will not prevent poor investment decisions and may even counterproductively induce them.

Finally, as noted above, policies that favor choice may be misguided, given the evidence of the effect that too many choices have on decisionmaking quality. Investors express a preference for choosing from a large assortment of products,¹¹⁸ but it is not clear that more choice is better for investors’ retirement accounts. First, increasing the number of investment

¹¹¹ Cooper, Halling & Lemmon, *supra* note 96, at 4.

¹¹² Choi, Laibson & Madrian, *supra* note 106, at 1430.

¹¹³ Shlomo Benartzi & Richard H. Thaler, *Naïve Diversification Strategies in Defined Contribution Saving Plans*, 91 AM. ECON. REV. 79 (2001).

¹¹⁴ *Id.*

¹¹⁵ *Id.* at 96.

¹¹⁶ See Ning Tang et al., *The Efficiency of Sponsor and Participant Portfolio Choices in 401(k) Plans*, 94 J. PUB. ECON. 1073, 1081 (2010) (finding that investors fail to construct efficient retirement portfolios, where efficiency is defined as maximizing the risk-adjusted return, and that individual allocation strategies are even less efficient than using a $1/n$ heuristic).

¹¹⁷ Maureen Morrin et al., *Saving for Retirement: The Effects of Fund Assortment Size and Investor Knowledge on Asset Allocation Strategies*, 42 J. CONSUMER AFF. 206, 214 (2008).

¹¹⁸ *Id.* at 207.

options increases investors' tendency to invest in a large number of funds.¹¹⁹ Second, and more problematic, 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.¹²⁰

C. Proposed Mechanisms and Proposed Solutions for Investor Mistakes

Although the empirical literature identifies a variety of possible shortcomings in investor decisionmaking, the precise mechanisms driving investors to choose 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.¹²¹ Yet one of the more recent studies to examine the effectiveness of these reforms found that the introduction of a shorter and simplified "summary prospectus" had no effect on investor behavior.¹²²

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. At an even more basic level, people are confused about the math. Finance scholars Annamaria Lusardi and Olivia Mitchell noted that half of the participants in a demographically diverse sample failed to realize that mutual funds do not pay a guaranteed rate of return,¹²³ and found that

¹¹⁹ See Morrin et al., *Investing for Retirement: The Moderating Effect of Fund Assortment Size of the 1/n Heuristic* 27 (Jan. 16, 2012) (unpublished manuscript), available at <http://ssrn.com/abstract=1008841> ("[C]onsidering 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.").

¹²⁰ Sheena S. Iyengar & Emir Kamenica, *Choice Proliferation, Simplicity Seeking, and Asset Allocation*, 94 J. PUB. ECON. 530, 530-38 (2010).

¹²¹ See Fisch, *supra* note 18, at 1968-69 (describing various SEC revisions to mutual fund disclosure requirements).

¹²² Beshears et al., *supra* note 105, at 90.

¹²³ Annamaria Lusardi & Olivia S. Mitchell, *Financial Literacy and Retirement Preparedness: Evidence and Implications for Financial Education*, BUS. ECON., Jan. 2007, at 35, 37.

fewer than twenty percent could correctly calculate a simple compound interest problem.¹²⁴

Even ideal disclosure requirements will have limited effectiveness, though, if investors are unable to use the information provided.¹²⁵ Lack of investor education or overtaxed cognitive resources might explain the inability of investors to estimate the costs associated with a one percent 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.¹²⁶ 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.¹²⁷ The report of the study, which the SEC released on August 30, 2012,¹²⁸ was a disappointment. 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.

The study concluded that U.S. retail investors “lack basic financial literacy.”¹²⁹ Nevertheless, the SEC focused primarily on investor preferences rather than attempting to identify mechanisms to improve the quality of

¹²⁴ *Id.* at 38 fig.1.

¹²⁵ See Jeff Schwartz, *Reconceptualizing Investment Management Regulation*, 16 GEO. MASON L. REV. 521, 568-83 (2009) (arguing that, in the absence of investor education, SEC disclosure rules do not lead investors to make better investment decisions).

¹²⁶ In the one area in which such biases seem 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.” Molly Mercer, Alan R. Palmiter & Ahmed E. Taha, *Worthless Warnings? Testing the Effectiveness of Disclaimers in Mutual Fund Advertisements*, 7 J. EMPIRICAL LEGAL STUD. 429, 441-55 (2010) (explaining that advertising past performance is highly effective and demonstrating that the current SEC disclaimer is too weak).

¹²⁷ Dodd–Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203, § 917, 124 Stat. 1376, 1836 (2010).

¹²⁸ Press Release, SEC, SEC Issues Financial Literacy Study Mandated by the Dodd–Frank Act (Aug. 30, 2012), available at <http://www.sec.gov/News/PressRelease/Detail/PressRelease/1365171484290#.UIAkO2TjW8k>.

¹²⁹ SEC STAFF STUDY, *supra* note 3, at iii.

investor decisions. For example, the SEC conducted a substantial online survey in which subjects were given investment information to review.¹³⁰ The survey questioned the investors not on their understanding of the material provided, but rather on their perception 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.¹³¹

Although the SEC study offered little of practical value, an improved understanding of retail investor decisionmaking would assist regulators in improving the manner in which \$18.5 trillion of U.S. retirement assets are invested.¹³² This information could also assist employers in designing retirement plans to optimize allocation decisions by employees. Furthering these objectives requires 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 Part, 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. For our experiment, we 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 decisions. In addition, our software required investors to click through the website in order to obtain specific information about fund choices and their attributes. By collecting and analyzing these clicks, we were able to identify the information that 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.

¹³⁰ Investors were given summary prospectuses of several actual mutual funds, but the fund names were changed to the fictitious "Petunia Core Equity," "Gardenia Asset Allocation Portfolio," and "Hydrangea Bush Government Bond Fund." *Id.* at 98-99.

¹³¹ *Id.* at 100-01.

¹³² PETER BRADY, KIMBERLY BURHAM & SARAH HOLDEN, INV. CO. INST., THE SUCCESS OF THE U.S. RETIREMENT SYSTEM 10-12 & fig.4 (2012), available at http://www.ici.org/pdf/ppr_12_success_retirement.pdf (reporting U.S. retirement assets as of June 30, 2012).

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 portfolios 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.¹³³

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).

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 Smith Fund	0 %
2	Money Market Fund	The Jones Fund	0 %
3	Fixed Income Fund	The Skyler Fund	0 %
4	Fixed Income Fund	The Durns Fund	0 %
5	Equity Index Fund	The Brown Fund	0 %
6	Equity Index Fund	The White Fund	0 %
7	Managed Equity Fund	The Powell Fund	0 %
8	Managed Equity Fund	The Lowe Fund	0 %
9	Managed Equity Fund	The Thomas Fund	0 %
10	Managed Equity Fund	The Hamlin Fund	0 %
Total			0

Submit

¹³³ See *infra* Section III.B for a description of the performance bonuses paid to each group of subjects.

Figure 2: Fee Information Page, Money Market Fund

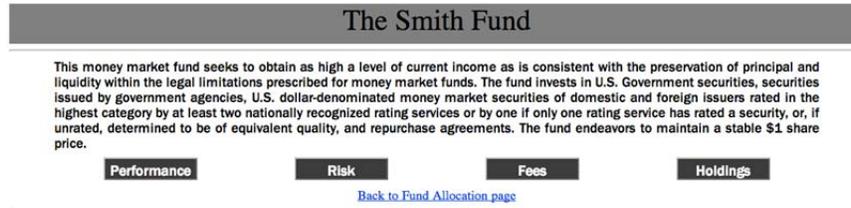
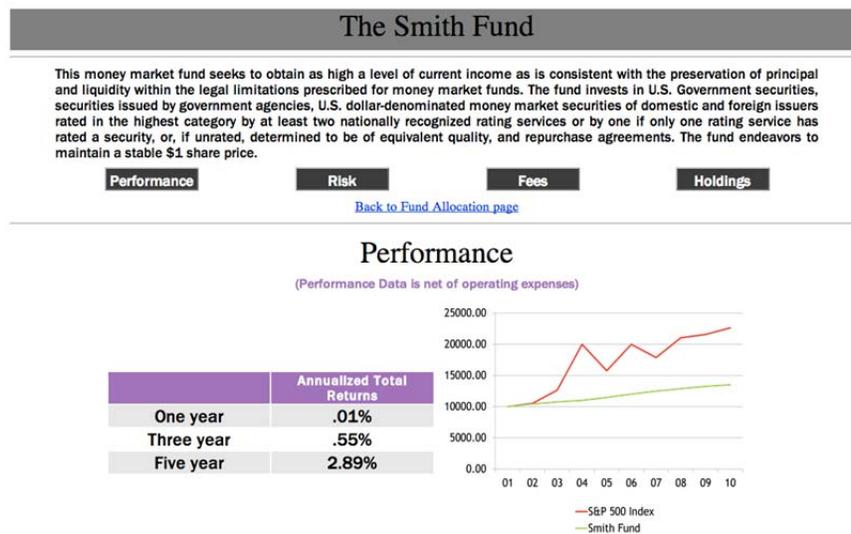


Figure 3: Performance Information, Money Market Fund



The information provided for each fund was presented in an identical and highly simplified format. Our study focused on information- and motivation-based reasons for investor mistakes rather than on 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 investors would make choices based on confusion

or inability to understand the fee disclosure.¹³⁴ Risk description language was taken from real mutual fund prospectuses, and the holdings page listed each fund's 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 2008 Financial Crisis on reported fund performance. In addition, using fictional funds also enabled 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,¹³⁵ to avoid the possibility that investors would infer information about fund style or strategy from the names of the funds.¹³⁶ On the fund allocation page, we also randomly varied the order in which funds appeared within their fund categories. A simplified presentation of fund attributes appears in Table 1.

¹³⁴ We did not include loads, 12b-1 fees, sponsor fee waivers, or other types of expenses. John Haslem, Kent Baker, and David Smith have 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, Baker & Smith, *supra* note 98, at 34-37.

¹³⁵ See *supra* note 130.

¹³⁶ See Michael J. Cooper, Huseyin Gulen & P. Raghavendra Rau, *Changing Names with Style: Mutual Fund Name Changes and Their Effects on Fund Flows*, 60 J. FIN. 2825, 2825, 2827 (2005) (finding investors directed money into funds that changed their names to reflect a “hot investment style”).

Table 1: Fund Attributes

Fund	Type	Five-year Return	Fees
1	Money Market	2.89%	.43%
2	Money Market	2.91%	.43%
3	Fixed Income	7.50%	.87%
4	Fixed Income	5.41%	.83%
5	Equity Index	8.67%	.10%
6	Equity Index	8.62%	.45%
7	Managed Equity	9.10%	.61%
8	Managed Equity	8.67%	.61%
9	Managed Equity	9.00%	1.62%
10	Managed Equity	9.70%	2.10%

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 [their] 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 that simulated fund returns over thirty years. Returns were ranked by asset class.¹³⁷ Consistent with our hypothesis, funds within each class were ranked so that funds with lower fees yielded higher returns. Because we were agnostic, for the purposes of this study, about the relative merits of professionally managed funds versus passive indexing,¹³⁸ we structured the returns of our lowest-cost index fund and

¹³⁷ 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 will be analyzed in a separate article.

¹³⁸ 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 (Oct. 11, 2012), <http://www.forbes.com/sites/rickferri/2012/10/11/indexes-beat-active-funds-again-in-sp-study> (detailing the consistent underperformance of actively managed funds and portfolios).

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)	2.10%
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 consisted of undergraduate students, graduate students, and some staff members who took the study at the University of Pennsylvania's Wharton Behavioral Lab (WBL). The WBL draws primarily undergraduate subjects from across the University of Pennsylvania campus. Its subjects are not limited 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 MTurk that pay subjects very small amounts of money for completing minor tasks and short questionnaires,¹³⁹ others have found that they are comparable to other survey panels.¹⁴⁰ Our goal in this study was to simulate the allocation decision faced by ordinary employees when choosing among investment options in their 401(k) plans. Using subjects who may have

¹³⁹ See Armin Falk & Ernst Fehr, *Why Labour Market Experiments?*, 10 LAB. ECON. 399, 402 (2003) (exploring the role of stake levels in experimental pools); see also Ernst Fehr & John A. List, *The Hidden Costs and Returns of Incentives—Trust and Trustworthiness Among CEOs*, 2 J. EUR. ECON. ASS'N 743, 764-65 (2004) (finding differences in the behavior of students and CEOs in studies concerning the effect of incentives).

¹⁴⁰ See, e.g., Gabriele Paolacci, Jesse Chandler & Panagiotis G. Ipeirotis, *Running Experiments on Amazon Mechanical Turk*, 5 JUDGMENT & DECISION MAKING 411, 412 (2010) ("Internet subject populations tend to be closer to the U.S. population as a whole than subjects recruited from traditional university subject pools.").

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.¹⁴¹

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 owning 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 one dollar for completing the study and an additional one dollar bonus if their portfolio values were above the median in their subject pool. Subjects who participated in the study via the WBL were paid a ten dollar showup fee for a session that included this experiment as well as other studies. Participants were instructed that they would also receive bonus payments proportionate to their total portfolio values at the end of the session—one dollar for every \$10,000 in their portfolios (rounded to the nearest quarter).

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 study contained an experimental manipulation. Specifically, we divided our subjects randomly into three groups—Performance, Fees, and Control. We provided subjects

¹⁴¹ We note that the self-reported education level of MTurk subjects is higher than that of the general population. *See id.*

in the Fees group with an instruction designed to focus investors' attention on the importance of considering fee information in the selection process.

The Fees Condition Instruction read as follows:

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.

The Performance Condition Instruction read as follows:

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 group 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 they received from a list of seven alternatives.¹⁴²

IV. STUDY RESULTS

A. Overall Descriptive Results

We report data from 197 MTurk subjects and 201 WBL subjects. Because of the demographic differences between our groups, we report results separately. Basic descriptive results, which also reflect some significant differences between the two subject groups, are reported in Table 4 below.

To summarize, our overall results provide a basis for guarded optimism. 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 that there

¹⁴² 49.2% of the MTurk participants and 57.2% of the WBL participants correctly identified the special instruction they received.

was 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	12.70	11.30
Total clicks	34.30	59.00
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 ten 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

As shown in Table 4, the WBL 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 MTurk subjects.

Figure 4 shows the mean investment across conditions in each fund. Figure 5 shows the overall distribution across subjects of the debt/equity split.

Figure 4: Histogram Showing Mean Percentage (Aggregated Across Conditions) of Portfolio Invested in Each Fund, by Subject Pool

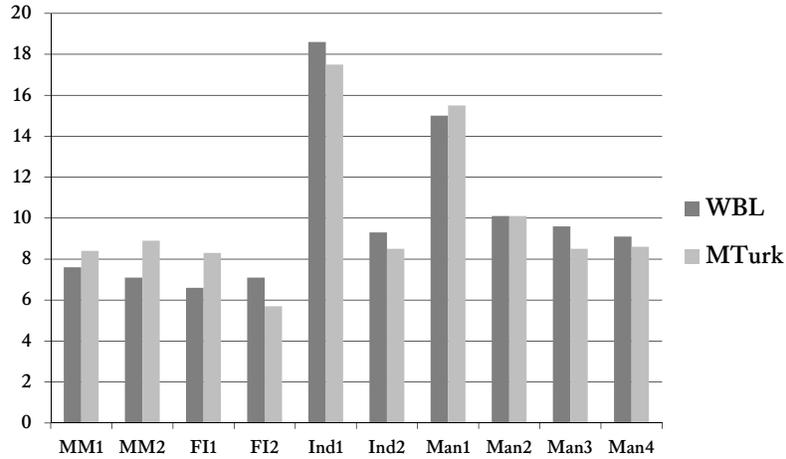
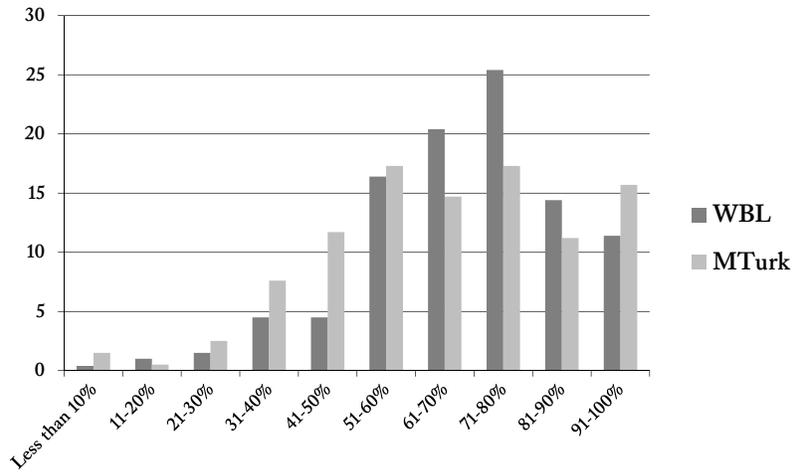


Figure 5: Histogram Showing Mean Percentage (Aggregated Across Conditions) of Total Portfolio Invested in Equity, by Subject Pool



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.¹⁴³ In addition, 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 5 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 group.

Second, we see substantial evidence of a strong preference for diversification, naïve or otherwise.¹⁴⁴ From these patterns of investment, it seems clear that subjects were not trying to pick funds. We expected that investors would attempt to identify the best fund in each category and then invest in a total of 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 they might appear from the aggregated statistics. Specifically, we see segmentation within our subject pools. As Figure 4 demonstrates, our aggregate results on diversification combine different investment patterns. In the WBL pool, for example, about a third of subjects invested in four to six funds total, and only a third invested in all ten funds. Although the subjects who invested in all ten funds—those who diversified most naïvely—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 market may be segmented in some important ways that we flag here for future research.

More problematic, 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. Overall, 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

¹⁴³ See *supra* Figure 5.

¹⁴⁴ See *supra* notes 113-115 and accompanying text.

MTurk investors allocated at least some money to a higher-fee actively managed fund that was really just a closet index fund, in that its holdings and performance were identical to those reported by the index funds. This was also true of 74.1% of WBL subjects. On a somewhat different point, 79.6% of WBL and 74.1% of MTurk investors allocated at least some money to a money market fund. They did so despite the instruction to invest for a thirty-year time frame for which liquidity concerns should be minimal. Notably, the reported returns of the money market funds were significantly lower than the other fixed income alternatives.

C. Response to Fee Instruction

In this Section, we analyze the effect of the fee instruction on subjects' beliefs and choices. Here, we compare the responses of the seventy-two WBL subjects assigned to the Fees condition with the responses of the sixty subjects assigned to the Control condition. Separately, we compare the responses of sixty-four MTurk subjects in the Fees condition with sixty-five in the Control condition.¹⁴⁵ As noted above, we exclude subjects in the Performance group from this set of analyses.¹⁴⁶

We found that investors who received the fee instruction differed from the Control group along three dimensions. First, they sought more information about fees. Second, they reported believing that fees were more important. Third, they shifted their allocations toward lower-cost funds.¹⁴⁷

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 forty percent more on the fees buttons—meaning that they

¹⁴⁵ We also analyzed gender differences. Men and women in the WBL subject pool did not differ on any of the primary dependent variables, including portfolio composition and clicking patterns. Women in the MTurk pool invested significantly more in safe (fixed income) funds than men did (34.8% versus 27.4%, $p=.015$).

¹⁴⁶ 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, and the importance of fees and investment in the lowest and highest fee funds, the results of the Performance group were statistically indistinguishable from the Control group. The Performance instruction did generate marginal differences in the investors' allocation among the various funds.

¹⁴⁷ 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 (d.f.), and p -value.

viewed fee information forty percent 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 on the fee disclosure more than twice as often as subjects in the Control group. In both subject pools, the fee instruction caused investors to search for more fee information than did the Control group.

Table 5: Fee Clicks by Condition, for WBL and MTurk Samples

	Fees Group Mean	Control Group Mean	<i>t</i>	d.f.	<i>p</i>
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 fee 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 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 fee 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 the number of subjects who reported diversification as the most important consideration and a corresponding increase in the percentage of subjects who reported that fees were the most important consideration. Notably, the fee instruction appeared to be new information to the MTurk subjects, as well as to the Wharton students, despite the fact that the MTurk subjects were significantly more experienced investors, with more than half reporting that they have a retirement account.

Table 6: Beliefs and Preferences by Condition, WBL Subjects

	Fees Group Mean	Control Group Mean	<i>t</i>	d.f.	<i>p</i>
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

	Fees Group Mean	Control Group Mean	<i>t</i>	d.f.	<i>p</i>
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 fee 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.¹⁴⁸ For example, a subject who invested half of his 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).

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 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 they 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

	Fees Group Mean	Control Group Mean	<i>t</i>	d.f.	<i>p</i>
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	23.50%	15.70%	3.18	119.20	.002
Average Percent of Portfolio Invested in Highest-Fee Fund	7.15%	11.42%	2.31	115.34	.022

¹⁴⁸ Differences in fund performance would cause the average fee to vary over the thirty years of the simulation.

Table 9: Fund Selection by Condition, MTurk

	Fees Group Mean	Control Group Mean	<i>t</i>	d.f.	<i>p</i>
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	118.40	.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	21.10%	13.90%	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.¹⁴⁹ This concentration measure assesses the degree to which a subject's portfolio differed from the naïve $1/n$ investment strategy.¹⁵⁰

The results here illustrate most dramatically the limitations of our fee instruction. For both subject pools, subjects in the Fees group had more concentrated portfolios than those in the Control group—that is, their

¹⁴⁹ See Beshears et al., *supra* note 105, at 87-88 (using a similar experimental design). 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, .10). The most diversified portfolio would be zero, and the most concentrated portfolio (100% in one fund, 0 in nine funds) is .949.

¹⁵⁰ We also measured diversification using the Herfindahl-Hirschman index, typically employed to measure the concentration of market power in an industry, which simply sums the squared percentage allocated to each fund. *Herfindahl-Hirschman Index*, DEP'T OF JUSTICE, <http://justice.gov/atr/public/guidelines/hhi.html> (last visited Jan. 24, 2014). This measure also yielded statistically significant differences in concentration by condition, at $p=.028$ for the WBL subject pool and $p=.067$ for the MTurk pool.

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 six total funds, and the median for WBL subjects was even higher, at eight total funds. In both cases, the mean number of funds invested in was 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

	Fees Group Mean	Control Group Mean	<i>t</i>	d.f.	<i>p</i>
Concentration, WBL	.333	.287	1.98	128.47	.050
Concentration, MTurk	.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 subgroup of subjects who we predict would be less in need of investor education. Because the MTurk subjects were not primarily drawn from a student population, we look here specifically at the subgroup 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 subgroup are less powerful because the sample size is smaller, we found that the fee instruction affected decisionmaking even when investors were not entirely new to investing.

Looking only at experienced investors, the fee instruction increased subjects' clicks on fee links from 3.9 to 8.7 clicks ($t=3.14$, $d.f.=58.12$, $p=.003$). Those who saw the fee instruction paid a significantly lower total fee (.63% vs. .75%) than those in the Control group ($t=2.13$, $d.f.=71.00$, $p=.037$). 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%, $t=1.85$, $d.f.=64.16$, $p=.069$). Experienced subjects in the Fees group were also much more likely to report that the most important

consideration was operating expenses, in comparison to experienced subjects in the Control group (percent difference=30.8, $t=3.46$, d.f.=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 the fee information is 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 fee 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 finding 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 investors' use of fee information to choose 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.¹⁵¹ 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. A two-minute questionnaire asked subjects to estimate the difference in value of two thirty-year investments of \$10,000 with an average (before fees) rate of

¹⁵¹ 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.

return of 8%, one with a 1% fee, and the other with a 2% fee.¹⁵² The correct answer was approximately \$20,000. The median response was \$3000, and almost forty percent 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 suggests 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 a big effect on funds' returns.

Limited investor understanding of the magnitude of the fee impact may also explain why our subjects' response to the fee 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 underestimate the importance of small fee differences. A more explicit instruction, such as one indicating that small differences in fees between funds can lead to payouts that differ by as much as thirty-five percent over the life of a retirement account, may have a greater effect on investor behavior. We intend, through future research, to experiment with varying the nature of the fee instruction in order to determine whether we can thereby improve its effectiveness.¹⁵³

Consistent with the literature, our findings about the extent of diversification seem to confirm a high degree of naïve diversification. 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 especially 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. Our findings also suggest that investors do not fully understand the objective of diversification. Here, as with fees, we intend to explore the

¹⁵² The study was a short survey on MTurk, in which 185 subjects were paid \$.75 and half received a \$.25 bonus for above-average accuracy. Before seeing the main question, they were told,

When 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 and without using a calculator.

¹⁵³ Cf. Mercer, Palmiter & Taha, *supra* note 126, at 455 (conducting an experiment to vary the strength of performance disclaimers and finding that strongly worded disclaimers were more effective).

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 understand the investment process. Efficient retirement investing demands that investors understand not only 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 longer) 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 a 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.¹⁵⁴ Delegating responsibility for 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.¹⁵⁵ 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.¹⁵⁶ Similarly, target-date funds vary substantially

¹⁵⁴ 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 participants turned their accounts over to professional money managers); Elizabeth O'Brien, *10 Things 401(k) Plans Won't Tell You*, MARKETWATCH (Feb. 23, 2013), <http://www.marketwatch.com/story/10-things-401k-plans-wont-tell-you-2012-11-09> (reporting that employees invest almost three times as much money in actively managed equity funds as they do in index funds, despite the higher cost of actively managed funds).

¹⁵⁵ See Gwendolyn A. Williamson, *Retirement Product Disclosure Rules and the Impact on Mutual Fund Distribution*, 19 INVESTMENT LAW., Oct. 2012, at 26, 28-29 (discussing common investor misunderstandings regarding target-date funds).

¹⁵⁶ See *id.* (noting that these concerns led the SEC to develop a rulemaking proposal for target-date funds); see also Investment Company Advertising: Target Date Retirement Fund

in terms of fees and complexity—one article reports that fees range from less than .2% to more than 1%.¹⁵⁷ 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 should perhaps 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 of choices that include several low-cost options. If investors do not avoid inferior investment options, however, the inclusion of inferior options, even alongside better alternatives, 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*,¹⁵⁸ that market competition renders judicial oversight of fees unnecessary. The relative insensitivity of investors to economically important fee differences suggests a market failure—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 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 a critical policy concern.

We constructed an experiment designed to inform the process of regulatory design by developing a greater understanding of investor decisionmaking 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

Names and Marketing, Securities Act Release No. 9126, Exchange Act Release No. 62,300, Investment Company Act Release No. 29,301, 75 Fed. Reg. 35,920 (proposed June 23, 2010) (proposing increased disclosure requirements in connection with the marketing of target-date funds).

¹⁵⁷ Pat Regnier, *3 Things to Know About Target-Date Funds*, CNNMONEY (July 31, 2012), <http://money.cnn.com/2012/07/31/retirement/target-date-fund-risks.moneymag/index.htm>.

¹⁵⁸ See *supra* note 11.

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, our findings suggest a research agenda for improving investor literacy.

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