Use of Advisors and Retirement Plan Performance

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As defined contribution (DC) plans become more popular than defined benefit (DB) plans, American workers are increasingly responsible for their retirement savings. Because retirement plan participants' portfolio allocation is constrained by the available funds in the plan, the construction of a plan's investment menu has become extremely important. No research has evaluated fund selection in retirement plans or compared plans involving an advisor with self-directed plans. To fill this research gap, this study employs cross-sectional, nationwide data that include 5,570 retirement plans with 100 or more participants in 2013, 2014, and 2015. Results show that in most cases, using advisors is not related to plan performance. Plan sponsors should require advisors to periodically evaluate the performance of plans under their management using objective measures.

Keywords: advisor, fund selection, mutual fund, performance, retirement plan, Sharpe ratio

Retirement plans are designed to replace a portion of employment income during retirement. Planning for retirement has become more important now than before (Guo & Finke, 2018; Pfau, 2018; Reyers, 2018). The last few decades witnessed a sizeable shift from defined benefit (DB) plans to defined contribution (DC) plans in the United States (Cheng et al., 2019; McFarland, 2018; Moreland, 2018). Consequently, the primary responsibility for securing adequate retirement income is largely transferred from employers to employees. Increasing concern regarding the future solvency of Social Security (De Villiers & Roux, 2019), as well as longer life expectancy (Pfau, 2018), also adds to the importance of DC plans. Although it is the responsibility of current employees to make decisions concerning whether to participate in their DC plans, how much to contribute, and how to invest their plan assets, their investment is constrained by available funds offered in the plan. In addition, employers (i.e., plan sponsors) still bear fiduciary responsibilities to plan participants and their beneficiaries in terms of the quality and the variety of the funds offered (U.S. Department of Labor, n.d.).

In the absence of in-house expertise, plan sponsors may pay for professional advice to limit their fiduciary liability and help employees build retirement savings. Professionals may provide investment recommendations by serving as a consultant, an ERISA 3(21) Fiduciary or an ERISA 3(38) Fiduciary (Levine, 2019; Sholberg, 2018). They are all defined as "investment advisor" in our study. However, each type of advisor undertakes a different level of fiduciary liability. A consultant has no fiduciary liability for investment guidance associated with the retirement plan. An ERISA 3(21) Fiduciary undertakes limited liability, since the plan sponsor still ultimately makes the final decision and takes on responsibility for doing so. An ERISA 3(38) Fiduciary serves as an investment manager who takes on full fiduciary liability for investment selection and monitoring.

An investment advisor can offer administrative assistance, such as enrolling participants and providing employee education. The core professional service of the plan advisor, however, is to make recommendations regarding investment options that are offered in the plan. These investment options have a direct impact on plan participants' retirement savings as, in most cases, participants' portfolios can only consist of investments chosen from the limited number of options in the menu. It is critical for plan sponsors and plan participants that their plan advisor's recommendation regarding fund selection in the

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plan is beneficial to plan participants by some objective measures.

The parties involved in helping plan sponsors manage their retirement plans include: record keeper, ERISA attorney, auditor, and plan advisor. The record keeper typically provides the following core functions: testing, record keeping, reporting, custody, and acting as trustees. ERISA attorney typically handles the plan document restatement and plan errors and corrections as they arise. The auditor conducts the audit if required. The plan advisor typically provides investment management, participant education, and administrative guidance. Since funds have to be selected, all plans that do not contract with a third-party advisor designate fund selection to their employees and put together an in-house investment committee to make the decisions.

To date, no study has been conducted to evaluate the contribution of an investment advisor to retirement plan fund selection by an objective performance measure or to compare fund selection between advised plans and unadvised plans. Some studies, however, examine the role of an investment advisor in individuals' financial life by evaluating their portfolio performance. Findings from these studies were controversial (Lei & Yao, 2016). While there are many potential reasons for this controversy, it is apparent that their analyses are based on different sampling techniques and some samples are not representative of the underlying population. Additionally, the term "investment advisor" referred to a vague group of financial professionals, which include some combination of financial planners, brokers, insurance agents, and so on. These professionals offer various types of services and have different compensation models, so they are unlikely to have the same relationship with investors' portfolios. Furthermore, advisors in different countries are subject to different compliance standards. Therefore, it is difficult to make a definitive conclusion whether the relationship between using an advisor and portfolio performance is positive or negative.

Since retirement plan participants' portfolio allocation is constrained by the available funds offered by the plan, fund selection plays a critical role in participants' retirement plan portfolio performance and asset accumulation. The purpose of this study is to evaluate advisors' service by examining retirement plans under their management, using objective fund-level and plan-level performance measures (referred to as "plan performance" in the rest of this article). The importance of evaluating fund-level performance is intuitive. Retirement plans allow participants with different risk tolerance levels to construct their individual plan portfolios. As such, the variety of funds and their correlations are also important to examine. Therefore, plan-level performance measures are a critical component of the overall retirement plan evaluation.

Retirement plan advisors are subject to the same compliance rules, have to meet certain requirements to serve in this role (Guillemette & Jurgenson, 2017), and their pay structure is usually either a flat fee, a percentage of asset under management, or a combination of both (Conole, 2018). Although research that examines the relationship between investment advisors and performance of their advised plans is scarce possibly due to the lack of data, it is generally acknowledged that retirement plans are considered to have benefited from financial advice when the mutual funds selected by advisors: (a) outperform funds selected by plan sponsors without assistance from an advisor or (b) outperform their benchmark. Since an experiment is required for the first comparison, comparing funds selected by advisors and their benchmark is more practical.

The contributions of this article are trifold: (a) evaluate the plan performance against the corresponding benchmark; (b) compare the plan performance between plans managed by advisors and those that are self-managed; and (c) assess the association between financial advice and plan performance by using a regression adjustment method.

Review of Literature

Prior empirical studies have shown that most Americans do not have sufficient financial literacy to plan for their own retirement (Lusardi & Mitchell, 2011). Many investors desire a targeted level of expected return but have limited understanding of the required risk (Jones et al., 2016). Those with low financial knowledge often find investment decisions overwhelming and tend to opt for the default allocation (Agnew & Szykman, 2005). This default allocation might be more prominent now than before because of the increasingly popular automatic enrollment and some plan participants view default rules as an implicit advice (McKenzie et al., 2006). Moreover, some investors apply naive diversification strategy (1/n strategy) by distributing their contributions evenly among the investment

assets available in the plan (Benartzi & Thaler, 2001). Regardless of the allocation strategies, the components in the portfolio depend on the funds offered in the plan menu.

Investment advisors have specialized human capital that can be beneficial in making financial decisions (Cummings & James, 2014). In mutual fund selection, they are skilled at emphasizing important information that individual investors are either unable to access or fail to consider (Jones et al., 2005). However, whether professional advice is positively related to the distribution of risk-adjusted return remains in dispute. Foerster et al., (2017) found that advisors directed clients to take more investment risk, thereby increasing clients' expected returns. On the other hand, they noticed that advisors suggested similar portfolios for clients regardless of their risk preferences and stage in the life cycle. Although research on whether advisors contributed positively to retirement plan fund selection is nonexistent, understanding whether and how individual investors benefit from advisors' service in general provide insights into understanding their contribution to retirement plans.

The Investor–Advisor Relationship

The investor–advisor relationship is a principal–agent relationship in which an investor (principal) hires an investment advisor (agent) to provide investment information that affects the investors' financial return (Golec, 1992). The investor's portfolio return is jointly determined by random market return, random portfolio-specific return, and idiosyncrasies of advisor's information services. When the investors observe a superior portfolio return, it is hard to determine whether their advisor has contributed to it or the portfolio-specific return was unusually large and positive. It is prohibitively costly for investors to monitor the advisor's performance. Therefore, unless the investors construct an optimal contract that provides proper incentives, their advisor has no incentive to devote time and effort to construct the optimal portfolio for their clients.

In the market for retail financial services, clients frequently pay for advice indirectly through commissions, distribution fees, and other inducements that flow to investment advisors from product providers (Inderst, 2011). Since financial advice is a credence good, advisors' own interest might compromise the value of the advice (Inderst & Ottaviani, 2009), leading clients to invest in products that generate more compensation for advisors but are not in the best interest of their clients. The conflict of interest issue is similar in the retirement plan world, where it is possible for some advisors to be motivated to select funds that provide better inducements.

Relationship Between Advisors and Individuals' Portfolio Performance

Many previous studies investigated the relationship between advisors and individual investors' decisions. These decisions include picking the assets and assigning a weight for each chosen asset. The advisors' job on each of these two tasks were not studied separately and empirical studies produced different findings. On one hand, a number of studies suggested a positive relationship because advisors had a formal financial education, an enhanced ability to gather and process information, and more experience in dealing with financial markets. By analyzing data from large brokerage banks in Germany (Bhattacharya et al., 2012) and a median-sized, full-service bank in the Netherlands (Kramer & Lensink, 2012), two European studies concluded that financial advice reduced clients' portfolio idiosyncratic risk and improved the risk-adjusted returns. In both studies, the banks paid a fixed wage to advisors. Using a large random sample of clients of a large brokerage bank in Israel, Shapira and Venezia (2001) found that professionally managed accounts were more diversified and earned slightly higher returns than independent investors' accounts.

On the other hand, several studies suggested a negative relationship between advisors' service and portfolio performance because of the conflict of interest between advisors and clients that arose from the advisor's pay structure. Bergstresser et al., (2009) assessed the cost and benefit of brokers in the mutual fund industry and found that although clients paid substantially higher fees, broker-sold funds deliver lower risk-adjusted returns. In addition, fund flows were positively related to distribution fees, suggesting that sales through a broker might be affected by a brokers' compensation and incentives. Hackethal et al., (2012) concluded that compared to self-directed investors, those who work with an investment advisor experienced higher portfolio risk and trading frequency but lower total returns and excess returns. In their case, investment advisors' income was mainly based

on sales commissions. Utilizing data from the Oregon University System's DC plan, Chalmers and Reuter (2010) showed that participants who used a broker owned funds that paid higher broker fees and their portfolios were associated with significantly higher risk and lower risk-adjusted returns. These empirical evidences highlighted the existence of the principal-agent conflict of interest.

In summary, advisors' professional background and access to investments that are inaccessible to individual investors enable them to positively contribute to investors' portfolio performance. Unfortunately, the contribution is often negated by the conflict of interest related to their pay structure. These studies contributed to the understanding of whether and how investors benefit from the service of investment advisors and shed light on the potential effects that advisors might have on retirement plan performance by selecting securities offered in the plan.

Hypothesis

The aforementioned issues that individual investors experience are applicable to retirement plans. Regardless of plan performance, plan advisors or their firms charge a fee for fund selection and administrative services such as participant education and enrollment. Advisors might be more motivated to improve the performance of the retirement plan if a portion of their pay is structured to be positively related to objective measures of retirement plan performance. Nonetheless, the plan advisor has the legal responsibility to design a menu of investment options to be offered by the plan and ensure that these options are appropriate for investors with various risk tolerance levels. The professional advice on retirement plan fund selection should have a positive contribution to the plan they service. Therefore, we hypothesize that retirement plans that work with an advisor perform better in that they have higher returns, lower risks, and higher risk-adjusted returns.

Methods

Data

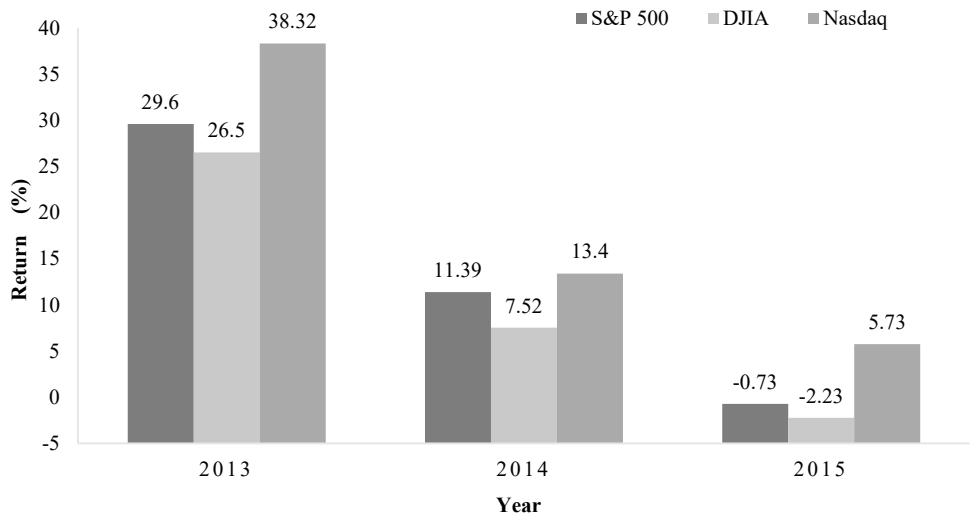
We obtained cross-sectional data from BrightScope, a leading independent provider of retirement plan ratings and investment analytics. BrightScope obtains data from submitted Form 5500 that is jointly developed by the Department of Labor, Internal Revenue Service, and the Pension Benefit Guaranty Corporation. Any ERISA plan that has more than 100 participants must file Form 5500. In accordance with ERISA section 103(a)(3)(A) and 29 CFR 2520.103-1(b), the plan's financial statement must also be audited by an Independent Qualified Public Accountant (IQPA) and attached to the Form 5500 (U.S. Department of the Treasury, U.S. Department of Labor, & Pension Benefit Guaranty Corporation, 2018). The financial statement provides the list of funds that are offered in the plan. In order to analyze the performance of the plan, our sample was randomly selected from ERISA plans with 100 or more participants. The total number of such plans was 81,870 in year 2013, 82,470 in year 2014, and 82,309 in year 2015.

The data consisted of four categories of retirement plans of various sizes based on their market values, $1 million to $10 million, $10 to $100 million, $100 to $500 million, and over $500 million. Each category included 500 retirement plans randomly selected from their size category, which equals a total of 2,000 retirement plans each year from 2013 to 2015. Table 1 reports the total population of each fund size category in each year (U.S. Department of Labor, n.d.). We assigned a weight to each plan based on the population size of the category it belonged to so that our sample is representative of its underlying plan population. In addition to the size category for each plan, the data contained information about the funds offered in each plan.

For each fund, we selected its best-fit asset class index benchmark identified by Morningstar, where we obtained information on each fund and its benchmark's monthly total rate of return net of fund expenses but before advisors' fees. The monthly returns for the funds and the benchmarks covered a 36-month period from January 2013 to December 2015. This period witnessed considerable market variabilities, with 2013 being the best year since 2009 and the latter two being flatter (Figure 1).

In addition, from the data provider's website, we collected information on whether the plans worked with a third-party investment advisor. In cases where information on the use of advisors was missing, affected retirement plans were excluded from the part of our study on the relationship between plan performance and use of advisors. Excluding plans with missing values resulted in a final sample of 1,835 plans in year 2013, 1,862 plans in year 2014, and 1,873 plans in year 2015.

Figure 1. Market performance, 2013 to 2015.



Note. Numbers are in percentages. Data retrieved from https://www.morningstar.com

Retirement Plan Performance Measures

In this study, we evaluated retirement plan performance and its relationship with the use of advisors by two approaches—a fund-level approach and a plan-level approach. At the fund-level, we first defined a fund to be an outperforming fund if it had a higher realized return (the geometric average of monthly nominal returns in a given year), a lower risk (standard deviation and downside risk), or a higher risk-adjusted return (Sharpe ratio and Sortino ratio) than its benchmark. Then, the ratio of outperforming funds in each plan was calculated. Finally, we tested if plans that worked with an advisor had higher outperforming ratios.

At the plan level, we assigned an equal weight to each fund offered in its retirement plan. For example, in a plan with 10 funds, we assigned each fund a weight of 10%. The benchmark for each retirement plan consists of the benchmark of each fund in that retirement plan. Funds in each benchmark plan received their weight in the same manner. We calculated the performance measures for both the retirement plan portfolio and its benchmark plan portfolio. We defined a retirement plan to be an outperforming plan if the plan portfolio had a higher expected return, a lower risk, or a higher risk-adjusted return than its benchmark plan portfolio. We also compared diversification ratio (Choueifaty & Coignard, 2008) between each retirement plan and its benchmark plan. The diversification ratio is the weighted sum of the standard deviation of all funds in the plan divided by the standard deviation of the plan. The advantage of this measure is that the portfolio has to be exposed to a more diversified number of risk sources instead of a simple higher number of assets or investments in order to have a higher ratio. A retirement plan is defined to be outperforming if the plan portfolio had a higher diversification ratio than its benchmark plan portfolio.

TABLE 1. Number of Contribution Plans and Sample Weights in 2013 to 2015

Plan Size	2013	2014	2015
$1m–$10m	37,671	37,248	37,415
(weights)	(0.457396)	(0.451018)	(0.455996)
$10m–$100m	32,170	32,960	32,558
(weights)	(0.389774)	(0.396626)	(0.391799)
$100m–$500m	7,957	8,105	8,064
(weights)	(0.100018)	(0.100065)	(0.099124)
$500m+	4,027	4,157	4,272
(weights)	(0.052813)	(0.052227)	(0.053081)
Total	81,870	82,470	82,309

Note. Data retrieved from U.S. Department of Labor. https://www.dol.gov/agencies/ebsa/researchers/statistics/retirement-bulletins/private-pension-plan

We adopted the 1/n strategy for multiple reasons. First, some investors do use this strategy by distributing their contributions evenly among the investment assets available in the

TABLE 2. Mean Ratio of Funds in Plans that Outperformed their Benchmark

Plan Size	2013	2014	2015
	Panel A: Higher realized return		
Overall	36.28	36.23	38.14
$1m–$10m	36.17	33.91	37.64
$10m–$100m	35.55	35.75	38.55
$100m–$500m	38.55	43.61	38.35
$500m+	38.62	46.33	38.95
	Panel B: Lower risk (standard deviation)		
Overall	57.24	48.00	49.46
$1m–$10m	57.38	48.17	49.32
$10m–$100m	57.66	47.93	50.06
$100m–$500m	56.74	47.81	48.47
$500m+	53.68	47.36	47.94
	Panel C: Higher Sharpe ratio		
Overall	44.75	34.51	39.50
$1m–$10m	43.34	33.31	39.01
$10m–$100m	44.07	34.20	40.13
$100m–$500m	51.32	38.11	39.15
$500m+	50.22	40.62	39.64
	Panel D: Lower downside risk		
Overall	55.59	44.20	41.03
$1m–$10m	55.61	43.77	40.00
$10m–$100m	56.64	44.39	41.68
$100m–$500m	53.92	45.39	41.86
$500m+	50.39	44.14	43.44
	Panel E: Higher Sortino ratio		
Overall	51.41	36.86	39.13
$1m–$10m	51.47	34.95	38.53
$10m–$100m	50.40	37.07	39.82
$100m–$500m	54.20	41.75	38.86
$500m+	53.42	42.66	39.57

Note. n_{2013} = 1,835, n_{2014} = 1,862, n_{2015} = 1,873, numbers in percentages, weighted results.

plan (Benartzi & Thaler, 2001). Second, there is no model of optimal asset allocation that can consistently outperform the 1/n strategy (DeMiguel et al., 2007). Third, it is reasonable to assume that funds in a plan are equally likely selected by unsophisticated investors. Fourth, this strategy serves our purpose to take fund correlation into account. Last, any other weight is more investor-specific than the 1/n strategy.

TABLE 3. Percentage of Advised Plans

Plan Size	2013	2014	2015
Overall	81.95	82.24	81.83
$1m–$10m	77.23	77.28	76.60
$10m–$100m	86.62	86.89	86.76
$100m–$500m	83.48	84.42	84.12
$500m+	85.71	85.53	85.68

Note. n_{2013} = 1,835, n_{2014} = 1,862, n_{2015} = 1,873, numbers in percentages, weighted results.

In the fund-level analysis, the dependent variables were the ratios of outperforming funds in the plan. In the plan-level analysis, the dependent variable was whether the plan outperformed its benchmark portfolio. In addition, S2, S3, and S4 were categorical variables indicating the fund size. S2 equaled to 1 if the market value of a plan was $10 to 100 million and 0 if not. Similarly, S3 and S4 indicated the $100 to 500 million and the over $500 million fund groups, respectively. For plans with a market value under $10 million, S2 = S3 = S4 = 0.

Data Analyses

We used OLS regressions to analyze the association between an advisor and plan outperformance at the fund level, in which the dependent variables were ratios of outperforming funds in a plan (results are reported in Table 5). To examine the association between an advisor and the probability of plan portfolio outperforming its benchmark portfolio, we adopted a logistic regression (results are reported in Table 7). Since our data were nonexperimental (i.e., observational) in that working with an advisor was a plan choice, not a random assignment, we estimated the "treatment effect" of advisors via regression adjustment (RA) that compared averages of treatment-specific predicted outcomes. We fitted regression models of performance measures on sizes separately for plans with an advisor and plans without an advisor and then computed two sets of values. The mean difference provided estimates of the average treatment effects (ATEs). Results are reported in Tables 6 and 8.

Results

Summary Statistics on Plan Performance

Fund-level Statistics. Evaluated by the Sharpe ratio or Sortino ratio, an overall average of 44.75% or 51.41% funds outperformed their benchmark in 2013 (Table 2). In general, the mean ratio of outperforming funds in a plan was

TABLE 4. ***Percentages of Plans that Outperformed Their Benchmark***

	2013			2014			2015		
Plan Size	**All**	**Adv.**	**No Adv.**	**All**	**Adv.**	**No Adv.**	**All**	**Adv.**	**No Adv.**
	***n* = 1,835**	***n* = 1,524**	***n* = 311**	***n* = 1,862**	***n* = 1,554**	***n* = 307**	***n* = 1,873**	***n* = 1,560**	***n* = 183**
Panel A: Higher expected return									
Overall	31.67	31.70	31.51	11.96	12.63	8.82	30.48	29.96	32.84
$1m–$10m	33.19	32.51	35.51	8.49	8.79	7.48	31.28	30.28	34.55
$10m–$100m	28.03	29.17	20.63	10.99	11.19	9.68	30.04	30.27	28.57
$100m–$500m	36.12	36.15	36.00	23.81	26.15	11.11	30.26	29.85	32.43
$500m+	37.64	36.77	42.86	27.41	29.23	16.67	27.33	25.32	39.39
Panel B: Lower risk (standard deviation)									
Overall	67.37	65.05	77.95	42.10	41.55	44.65	47.66	47.16	49.93
$1m–$10m	68.09	65.01	78.50	40.34	37.64	49.53	44.68	42.22	52.73
$10m–$100m	68.79	66.42	84.13	42.71	43.07	40.32	47.27	47.94	42.86
$100m–$500m	63.88	63.85	64.00	46.75	50.26	27.78	53.86	55.10	47.30
$500m+	56.46	56.61	55.56	44.08	44.36	42.42	65.08	65.06	65.15
Panel C: Higher Sharpe ratio									
Overall	44.77	42.83	53.58	12.33	13.10	8.76	30.91	30.65	32.08
$1m–$10m	45.74	44.08	51.40	8.28	8.52	7.48	31.06	30.28	33.64
$10m–$100m	40.55	38.73	52.38	12.26	12.65	9.68	31.09	31.72	26.98
$100m–$500m	55.29	52.77	68.00	24.03	26.41	11.11	31.33	30.61	35.14
$500m+	48.53	46.30	61.90	26.32	28.21	15.15	27.33	25.32	39.39
Panel D: Lower downside risk									
Overall	58.93	56.40	70.43	41.51	40.73	45.13	24.79	24.57	25.78
$1m–$10m	58.30	55.37	68.22	38.22	35.71	46.73	22.13	21.39	24.55
$10m–$100m	59.45	57.11	74.60	42.07	41.85	43.55	24.79	24.21	28.57
$100m–$500m	63.00	61.48	70.67	50.65	52.82	38.89	31.55	34.18	17.57
$500m+	52.83	49.74	71.43	48.68	48.97	46.97	35.36	34.43	40.91
Panel E: Higher Sortino ratio									
Overall	44.58	42.65	53.34	15.49	16.00	13.13	32.35	32.20	33.03
$1m–$10m	44.26	42.15	51.40	10.62	10.71	10.28	33.62	33.06	35.45
$10m–$100m	42.25	40.69	52.38	16.28	16.06	17.74	31.51	32.20	26.98
$100m–$500m	54.41	52.24	65.33	26.62	29.49	11.11	31.97	31.63	33.78
$500m+	46.71	44.18	61.90	31.14	32.31	24.24	28.42	26.58	39.39

Note. n_{2013} = 1,835, n_{2014} = 1,862, n_{2015} = 1,873, numbers in percentages, weighted results.

higher for plans with a larger market value (Panels C and E). Except for the realized returns, which did not display a clear trend, outperformance ratios were the highest in 2013, the year with the highest market returns among all 3 years, for funds in all categories as measured by risks and risk-adjusted returns. In all 3 years, an overwhelming majority (about 80%) of retirement plans used advisors (Table 3). The percentages of advised plans were the lowest for the smallest plans in all 3 years, while plans with a $10 to 100 million market value had the highest percentages of using advisors.

Plan-level Statistics. In general, the percentage of plans that outperformed their benchmark plan was higher for plans with a larger market value (Table 4). The smallest plans experienced the biggest deviations from their benchmark as measured by the risk-adjusted returns. The Sharpe ratio of

TABLE 5. OLS Regression of Factors Contributing to Ratio of Outperforming Funds in a Plan

	2013	2014	2015
	Panel A: Higher realized return		
Advisor	−.0424*	−.0002	−.0037
S2	−.0618*	−.0071	.0257
S3	−.0013	.0490	.0197
S4	.0028	.1279***	.0336
S2*Advisor	.0693*	.0294	−.0186
S3*Advisor	.0344	.0568*	−.0146
S4*Advisor	.0300	−.0044	−.0234
Constant	.3940***	.3392***	.3792***
	Panel B: Lower risk (Standard Deviation)		
Advisor	−.0400*	−.0190	−.0021
S2	.0087	−.0025	−.0019
S3	−.0418	−.0558**	−.0356
S4	−.0399	−.0066	−.0274
S2*Advisor	−.0031	.0022	.0109
S3*Advisor	.0443	.0635**	.0324
S4*Advisor	.0067	.0003	.0160
Constant	.6052***	.4964***	.4948***
	Panel C: Higher Sharpe ratio		
Advisor	−.0233	−.0125	−.0054
S2	−.0085	−.0163	.0205
S3	.0571*	−.0111	.0183
S4	.0616*	.0648*	.0289
S2*Advisor	.0210	.0304	−.0101
S3*Advisor	.0291	.0709*	−.0196
S4*Advisor	.0108	.0107	−.0258
Constant	.4512***	.3428***	.3943***
	Panel D: Lower downside risk		
Advisor	−.0587***	−.0245	−.0012
S2	.0109	.0185	.0049
S3	−.0168	−.0394	−.0209
S4	−.0385	−.0071	.0316
S2*Advisor	.0053	−.0115	.0139
S3*Advisor	.0040	.0679**	.0471*
S4*Advisor	−.0108	.0149	.0034
Constant	.6017***	.4567***	.4009***
	Panel E: Higher Sortino ratio		
Advisor	−.0357*	.0000	−.0032
S2	−.0389	.0154	.0201

(*Continued*)

TABLE 5. OLS Regression of Factors Contributing to Ratio of Outperforming Funds in a Plan *(Continued)*

	2013	2014	2015
S3	.0193	.0235	.0249
S4	.0137	.0757**	.0339
S2*Advisor	.0364	.0068	−.0079
S3*Advisor	.0126	.0528	−.0254
S4*Advisor	.0103	.0017	−.0272
Constant	.5423***	.3495***	.3878***

Note. n_{2013} = 1,835, n_{2014} = 1,862, n_{2015} = 1,873.
*$p < .05$. **$p < .01$. ***$p < .001$.

plans in the smallest size category that outperformed their benchmark decreased from 45.74% to 8.28% and then rose to 31.06% over the 3 years (Panel C). Similarly, the ratio of outperforming plans declined from 44.26% to 10.62% then increased to 33.62%, measured by the Sortino ratio (Panel E). The difference between advised and unadvised plans was also bigger for larger plans. Similar to results at the fund-level, the plan-level outperformance ratios were the highest in 2013 for plans in all categories, as measured by risks and risk-adjusted returns. In most cases, the percentage of outperforming plans was higher for unadvised plans than advised plans in 2013 and 2015. However, in 2014, there was not a clear distinction between advised plans and unadvised plans.

Use of Advisors and Plan Performance: Fund-Level

Negative Relationship. A significant negative relationship between advisor and plan performance existed in the smallest plan category in 2013 when performance was measured by realized return, standard deviation, downside risk, and Sortino ratio. For instance, among the smallest plans, an average of 54.23% of funds in unadvised plans had a higher Sortino ratio than their benchmark (Table 5); however, this percentage averaged to be 50.66% (3.57 percentage points lower) for advised funds in the same size category (Panel E).

Positive Relationship. In 2013, among plans in the $10 to 100 million category, advisors made a significantly positive contribution to plan performance as measured by realized return. On average, 35.91% of funds in advised plans obtained a higher realized return than their benchmark, and this percentage was 33.22% for unadvised funds (Panel A). In 2014, advisors for the $100 to 500 million category positively contributed to plan performance at the fund level by all measures except for the Sortino ratio. In 2015, the only significant result existed for plans in the $100 to 500 million category when performance was measured by downside risk, as average outperformance ratio was 4.71 percentage points higher for advised plans than unadvised plans (Panel D).

Average Treatment Effect. We performed two robustness checks, estimating the average treatment effects (ATEs) by using the nearest-neighborhood matching (NNM) and the propensity-score matching (PSM) methods. Results were consistent with those presented in Table 5 at the fund level and Table 7 at the plan level. The estimated ATEs were significantly negative in 2013 for all plans on three out of the five performance measures (Table 6). Had these plans worked with an advisor, they would have had fewer outperforming funds in terms of total risk, downside risk and Sortino ratio. For example, plans with a market value of less than $10 million would have 2.05% fewer funds that had a higher Sortino ratio (Panel E). In 2014 and 2015, unadvised plans would have benefited from working with an advisor. For example, plans in the $100 to 500 million category would have had 2.92% more funds that achieved a higher realized return in 2014 (Panel A).

Use of Advisors and Plan Performance: Plan-Level

Negative Relationship. In 2013, advised plans in the under $10 million category were significantly less likely to outperform their benchmark than unadvised plans in terms of total risk (coefficient = −0.6998), downside risk (coefficient = −0.5256), and diversification ratio (coefficient = −0.5764; Table 7). Additionally, in 2013, advised plans with a market value of $100 to 500 million were significantly less likely to outperform their benchmark than unadvised plans in terms of total risk (coefficient = −0.0586), downside risk (coefficient = −0.4609), and Sortino ratio (coefficient = −0.2452).

TABLE 6. Average Treatment Effect of Advisors on Ratio of Outperforming Funds in a Plan

Plan Size	2013	2014	2015
	Panel A: Higher realized return		
Overall	−1.18	2.03	−1.78
$1m–$10m	−1.35	1.86	−1.76
$10m–$100m	−1.12	2.92**	−1.55
$100m–$500m	−1.47	2.54*	−1.49
$500m+	−1.50	2.18*	−1.56
	Panel B: Lower risk (standard deviation)		
Overall	−2.77**	−0.27	1.27
$1m–$10m	−2.64**	−0.16	1.35
$10m–$100m	−3.07**	−0.46	1.02
$100m–$500m	−2.87**	−0.31	1.15
$500m+	−2.81**	−0.40	1.18
	Panel C: Higher Sharpe ratio		
Overall	−0.70	1.55	−1.92
$1m–$10m	−0.90	1.51	−1.91
$10m–$100m	−0.17	1.91	−1.72
$100m–$500m	−0.47	1.74	−1.68
$500m+	−0.60	1.47	−1.74
	Panel D: Lower downside risk		
Overall	−5.81***	−0.70	1.49
$1m–$10m	−5.74***	−0.58	1.56
$10m–$100m	−6.14***	−0.82	1.64
$100m–$500m	−5.97***	−0.61	1.69*
$500m+	−5.79***	−0.66	1.51
	Panel E: Higher Sortino ratio		
Overall	−1.88*	1.53	−1.83
$1m–$10m	−2.05*	1.48	−1.83
$10m–$100m	−1.77*	2.05	−1.58
$100m–$500m	−2.07*	1.94	−1.56
$500m+	−2.08*	1.73	−1.63

Note. n_{2013} = 1,835, n_{2014} = 1,862, n_{2015} = 1,873; numbers in percentages.
*$p < .05$. **$p < .01$. ***$p < .001$.

Positive Relationship. In 2013, using an advisor was positively related to plan performance for larger plans, which achieved a higher diversification ratio than their benchmark plan (Panel F of Table 7). The coefficient indicating the positive result of using an advisor was 0.4000 for plans in the $10 to 100 million category, 0.2227 for plans in the $100 to 500 million category, and 0.3844 for plans in the $500+ million category. Using an advisor improved plan performance in terms of total risk, downside risk, and Sortino ratio for plans with a $100 to 500 million market value in 2014, and in terms of total risk and downside risk for plans of the same size in 2015. It is interesting to see that advisors positively contributed to plan diversification in 2013 but decreased the chance of plan outperformance in terms of total risk and downside risk.

Average Treatment Effect. The ATEs were significant in 2013 in half of the performance measures (Table 8). For unadvised plans, using an advisor would have significantly lowered the expected return for all plans except for those in the $10 to 100 million category. Using an advisor would also have lowered the Sharpe ratio and increased the downside risk for all plans, as well as lowered the Sortino ratio for the plans in the smallest and the largest categories. For example, unadvised plans with a market value of less than $10 million would have a 0.05% lower expected return (Panel A), 3.06% lower Sharpe ratio (Panel C), 2.15% lower Sortino ratio (Panel E), and 0.08% higher downside risk (Panel D) if they consulted with an advisor. ATEs in 2013 and 2015 indicate that using an advisor would have had no or a slightly negative relationship with plan portfolio performance.

Conclusion and Implications

Conclusion

This study used cross-sectional, nationwide data in 2013, 2014, and 2015 to examine the association between using plan advisors and retirement plan performance after accounting for fund expenses but not advisors' fees. Retirement plan performance was evaluated at both the fund level and the plan level by several measures in each year. Descriptive statistics showed that at both the fund level (Table 2) and the plan level (Table 4), the percentage of plans that outperformed their benchmark was generally higher in 2013 than the latter 2 years. However, as showed by Table 4, this outperformance mainly came from plans that did not work with an advisor. In 2014, although the overwhelming percentages of outperformance were under 50% and in some cases less than 10%, advised plans did better in most cases by various performance measures. Among larger plans, unadvised plans performed worse by most measures in 2015.

After controlling for plan size and use of advisors, advised plans had more negative outcomes than unadvised plans in

TABLE 7. Logit Regression of Factors Contributing to Plan Outperformance at the Plan Level

	2013	2014	2015
	Panel A: Higher expected return		
Advisor	−.1058	.1763	−.1950
S2	−.7220	.2821	−.2772
S3	.0708	.4362	−.0949
S4	.3464	.9062	.2083
S2*Advisor	.5656	−.0139	.2767
S3*Advisor	.0943	.8652	.0744
S4*Advisor	−.1605	.5490	−.4560
Constant	−.6251**	−2.5157***	−.6391**
	Panel B: Lower risk (standard deviation)		
Advisor	−.6998**	−.4863*	−.4229
S2	.3488	−.3734	−.3969
S3	−.7057*	−.9368**	−.2174
S4	−1.0401**	−.2867	.5165
S2*Advisor	−.2858	.5991	.6282
S3*Advisor	.6412	1.4520***	.7359*
S4*Advisor	.6778	.5651	.4190
Constant	1.3189***	−.0187	.1092
	Panel C: Higher Sharpe ratio		
Advisor	−.2415	.1415	−.1546
S2	.0770	.2821	−.3159
S3	.7780*	.4362	.0664
S4	.4517	.7929	.2488
S2*Advisor	−.3127	.1600	.3833
S3*Advisor	−.4445	.9132	−.0506
S4*Advisor	−.3777	.6469	−.4965
Constant	.0183	−2.5157***	−.6795**
	Panel D: Lower downside risk		
Advisor	−.5256*	−.4568*	−.1786
S2	.3288	−.1285	.2067
S3	.1771	−.3210	−.4229
S4	.2111	.0097	.7553*
S2*Advisor	−.2657	.3873	−.0461
S3*Advisor	.0647	1.0217**	1.0694*
S4*Advisor	−.4555	.5371	−.0978
Constant	.7487***	−.1310	−1.1230***
	Panel E: Higher Sortino ratio		
Advisor	−.3687	.0462	−.1066
S2	.0434	.6325	−.3963
S3	.6381*	.0870	−.0738

(*Continued*)

TABLE 7. Logit Regression of Factors Contributing to Plan Outperformance at the Plan Level *(Continued)*

	2013	2014	2015
S4	.4558	1.0270*	.1683
S2*Advisor	−.1048	−.1661	.3575
S3*Advisor	−.2452	1.1614*	.0088
S4*Advisor	−.3820	.3536	−.4786
Constant	.0551	−2.1665***	−.5991**
	Panel F: Higher diversification ratio		
Advisor	−.5764**	−.4944*	−.3781
S2	−.9036**	−.4189	−.1957
S3	−1.3635***	.1296	.6665*
S4	−1.1122**	−.3371	1.0883**
S2*Advisor	.9764**	.3284	.3180
S3*Advisor	.7991*	−.0705	.0500
S4*Advisor	.9608*	.4174	−.1673
Constant	−.0918	.0935	−.7205***

Note. n_{2013} = 1,835, n_{2014} = 1,862, n_{2015} = 1,873.
*$p < .05$. **$p < .01$. ***$p < .001$.

2013 at the fund level (Table 5) and an equal number of positive and negative outcomes at the plan level (Table 7). However, advised plans in the $100 to 500 million market value category experienced some positive outcomes in terms of beating their benchmark at the fund level in 2014 and 2015 (Table 5) and at the plan level in all 3 years (Table 7). In most cases in the latter 2 years, advised plans performed the same as those unadvised plans.

In summary, working with an advisor was significantly and negatively related to retirement plan performance in 2013, the best year among three in terms of market return, and had a slight positive or no significant result in the latter 2 years when the market was flatter. Although advised plans appeared to have a slightly higher diversification ratio in 2013 (Table 7), they had less chance to beat their benchmark in terms of total risk and downside risk and did not outperform their benchmark by expected return, Sharpe ratio, or Sortino ratio.

Although advised plans had some success beating their corresponding benchmark over the 3-year period at the fund level, the majority of funds selected by these plans still underperformed their benchmark by all measures in 2014 and 2015 (Table 2). Only in 2013, the year with the best market performance among three, some of the outperformance ratios slightly exceed 50%. This conclusion was also true at the plan level (Table 4). In most cases, the majority of plan portfolios underperformed their benchmark portfolio, and the underperformance was more serious in 2014 and 2015.

Statistical significance may not be the same as economic significance. However, the differences we found are sizable. For example, among the smallest plans, an average of 54.23% of funds in unadvised plans had a higher Sortino ratio than their benchmark (Table 5); however, this percentage averaged to be 50.66% (3.57 percentage points lower, or 6.58% lower) for advised funds in the same size category (Panel A). In places where the differences seem small (Table 8), those numbers are on a monthly basis and are sizable if translated into yearly terms. For example, in 2013, the estimated average treatment effect of advisors was −0.04% in monthly expected returns and this difference would be −0.48% annually. Over the long-run as in most retirement planning cases, this compounding effect would have a large economic impact.

The current study focuses on whether hiring a third-party advisor would make a difference in plan performance. Due to data limitation, the differences among the three types of advisors who take on different levels of fiduciary responsibilities are outside of the scope of the current study.

TABLE 8. Average Treatment Effect of Advisors on Plan Performance at the Plan Level

	2013	2014	2015
	Panel A: Expected return		
Overall	−0.04**	−0.01	−0.02
$1m–$10m	−0.05**	−0.01	−0.02
$10m–$100m	−0.03	−0.01	−0.01
$100m–$500m	−0.04*	−0.01	−0.02
$500m+	−0.04**	−0.01	−0.02
	Panel B: Risk (standard deviation)		
Overall	0.29	−0.01	−0.02
$1m–$10m	0.28	−0.02	−0.02
$10m–$100m	0.30	−0.01	−0.02
$100m–$500m	0.29	−0.01	−0.02
$500m+	0.29	−0.01	−0.02
	Panel C: Sharpe ratio		
Overall	−2.87***	−0.08	−0.74**
$1m–$10m	−3.06***	−0.10	−0.77**
$10m–$100m	−2.55***	−0.02	−0.67*
$100m–$500m	−2.84***	−0.02	−0.74**
$500m+	−2.85***	−0.01	−0.77**
	Panel D: Downside risk		
Overall	0.07**	0.02	−0.01
$1m–$10m	0.08**	0.02	−0.01
$10m–$100m	0.06*	0.03	−0.02
$100m–$500m	0.07**	0.03	−0.02
$500m+	0.07**	0.03	−0.01
	Panel E: Sortino ratio		
Overall	−1.90*	−0.01	−0.20
$1m–$10m	−2.15*	−0.03	−0.21
$10m–$100m	−1.31	0.06	−0.19
$100m–$500m	−1.73	0.03	−0.21
$500m+	−1.87*	0.03	−0.21
	Panel F: Diversification ratio		
Overall	−0.31	0.32	0.42
$1m–$10m	−0.14	0.36	0.47
$10m–$100m	−0.87	0.05	0.15
$100m–$500m	−0.60	0.15	0.31
$500m+	−0.45	0.27	0.45

Note. n_{2013} = 1,835, n_{2014} = 1,862, n_{2015} = 1,873; numbers in percentages.
*$p < .05$. **$p < .01$. ***$p < .001$.

However, examining the differences between these three types of advisors could be an interesting topic for future research.

Implications for Practice

For Plan Sponsors. In today's world, where most individuals who shoulder the major responsibility to save for their retirement do not have an adequate level of financial literacy and where the financial market is extremely complex with numerous types of investment options, it is unreasonable to assume that an average individual would make optimal investment decisions. For retirement plan participants, these decisions include selecting funds offered in the plan to be included in their portfolio and assigning an appropriate weight to each of the selected funds. The universe of funds offered in the retirement plan is a critical component in participants' retirement portfolio allocation and asset accumulation. Plan sponsors are plan fiduciaries and have the legal duty to help plan sponsors select funds that allow participants with different risk tolerance levels construct optimal portfolios. It is possible that some advisors do not have free reign over fund selection due to restrictions set by their employer. This creates a conflict of interest that prohibits the advisor from being the plan's fiduciary and is a possible explanation of the lack of outperformance of advised plans.

For Plan Advisors. Retirement plan advisors have to meet certain requirements to serve in this role and are, most importantly, paid to provide a service that is expected to be in the best interest of plan participants and their beneficiaries. However, plan sponsors should be aware that not all advisors take on the fiduciary liability and should make efforts to identify whether an advisor serves as a fiduciary. Regardless of the role of the plan advisor, plan sponsors always have the liability of due diligence in vetting and selecting appropriate fiduciaries for the plan (Levine, 2019). Plan sponsors should require advisors to actively evaluate the performance of those plans under their management, using objective measures and comparing the plans with their appropriate benchmark. It is necessary that advisors conduct this evaluation periodically and replace underperforming funds in the plan to improve the plans performance. Whether the advisor or their firm provides administrative services such as enrolling and educating participants, and these service should certainly be compensated, it is a separate issue from the plan's performance. Advisors' service in

terms of fund selection for the plan under their management should be evaluated by objective measures such as those used in this study and compensated based on the outcome of such evaluation. In situations where plan participants are better off purchasing index alternatives, the portion of compensation paid to plan advisors for their fund selection recommendations is difficult to justify.

For Financial Advisors. This study also has implications to financial advisors or planners who do not advise the plan but provide financial advice to plan participants at the individual level. These advisors or planners have the duty to also periodically evaluate the performance of the funds that are included in their clients' retirement plan, using the same methods adopted in this study. If the clients' retirement plan suffers a performance problem, they should inform their clients of this issue and ask them to report such issue to their plan sponsor. In the meantime, the advisor or planner should evaluate if the outperforming funds in the plan can be selected to satisfy the clients' needs. If the outperforming funds cannot sufficiently satisfy the clients' needs, then the advisor has to evaluate alternatives of investing in the plan or outside the plan. Although the funds within the plan are underperforming, many plans provide a match. The match has to be considered when evaluating alternatives.

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