

The Impact of Expert Guidance on Participant Savings and Investment Behaviors

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Abstract

Determining how much to save for retirement and how to invest those savings is a complex problem. As defined contribution plans, such as 401(k) plans, become more popular, individuals are increasingly forced to make these decisions themselves. One potential solution to help DC participants better achieve retirement goals is “Expert Guidance,” which, for purposes of this paper, is defined as professional online retirement advice on optimal savings and investing decisions.

In this paper the potential benefits of Expert Guidance are estimated using actual historical changes in savings rates and portfolio allocations for participants who use Morningstar® Retirement ManagerSM an advice and managed account platform. The impact of Expert Guidance is determined by contrasting the savings and investing decisions of DC participants after receiving Expert Guidance with those made before receiving it. The results of this analysis suggest that individuals can potentially realize additional savings and investment benefits from Expert Guidance, such as increased savings levels and diversified investment allocation, which may lead to greater potential returns and more income in retirement, even after accounting for potential fees.

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Key Findings

Savings

- ▶ On average, participants increased their deferral rates by 2.19 percentage points to 10.14% after receiving Expert Guidance, which represents a relative increase of 27.65%.
- ▶ After receiving Expert Guidance, 86.80% of participants increased their deferral rate, 10.75% kept their deferral rate the same, and 2.45% of participants decreased their deferral rate.
- ▶ Younger and lower-income participants tended to increase their deferral rates the most after receiving Expert Guidance, on both a relative and an absolute basis.
- ▶ Increased deferrals resulted in higher employer matching contributions. Employer matching contributions increased by 0.28 percentage points, on average, after receiving Expert Guidance, to 3.03% from 2.76%, which is a relative increase of 9.78%.
- ▶ Among participants in plans that offer an employer matching contribution, 77.69% deferred the amount required to receive the maximum employer match before receiving Expert Guidance, while 92.42% deferred the maximum matching level after receiving Expert Guidance.
- ▶ The total savings rates, which include both employee deferrals and employer matching contributions, rose on average by 2.48 percentage points to 13.18% after receiving Expert Guidance, which represents a relative increase of 23.14%.

Investing

- ▶ Among “do-it-yourself” participants, 48.07% held three or fewer funds, of which 22.69% held only one fund before receiving Expert Guidance. After receiving Expert Guidance, participants held six to nine funds on average. DIY participants here are defined as individuals who have an allocation of 20% or less of their total portfolio allocated to an “Allocation” fund as categorized by Morningstar.
- ▶ An analysis is performed where the future one-year performance of the allocation implemented after receiving Expert Guidance is contrasted with the future one-year performance of the allocation before receiving Expert Guidance. This analysis is hypothetical in nature because it assumes the investor would have held the allocation before receiving Expert Guidance and after receiving Expert Guidance over the following year. When contrasted, the average future one-year hypothetical performance for participants after receiving Expert Guidance was 2.22 percentage points higher than the future one-year hypothetical performance of the allocations before receiving Expert Guidance. Even after adjusting for the varying levels of equity risk, the future return of the portfolios after receiving Expert Guidance outperformed the previous allocations by 0.62 percentage points over the next one-year period, on average.
- ▶ Before receiving Expert Guidance, the data suggests that investors’ confidence in equity allocations was dented by the global financial crisis and did not recover in time to take advantage of the recovery in market values. The average equity allocation for participants before receiving Expert

Guidance was approximately 66% of total assets in May 2007, declining to about 43% in January 2010, and rising to only about 59% by February 2014.

- ▶ The average risk tolerance for participants, represented by their responses to a risk tolerance questionnaire, varied over the analysis period with risk tolerance decreasing significantly during the financial crisis. This suggests that portfolio assignments based primarily on risk tolerance may result in inconsistent allocations over time.

Combined Impact

- ▶ The long-term benefit of Expert Guidance realized by a participant will vary depending on the fees charged for the service. This analysis shows an average 25-year-old participant would realize 53.91% more retirement income (based on both savings and asset allocation changes) after using an Expert Guidance service with no annual fee and an increase of 19.34% after using an Expert Guidance service with a 1% annual fee. If the participant were to withdraw 4% of the balance during the first year of retirement (i.e., follow the “4% Rule”) these improvements would result in annual increases in retirement income of \$28,921 and \$10,375, respectively.
- ▶ Additionally, there is a 92.6% probability of a 25-year old participant having more wealth at retirement as a result of Expert Guidance assuming no annual fee and an 80.3% probability of having more wealth with a 1.0% annual fee. The median expected increases in wealth for 25-year-olds is 105.3% and 62.6%, respectively, for the two fee levels.
- ▶ While these results are significant, approximating the value of Expert Guidance based entirely on changes in savings rates and investment allocations is incomplete. Expert Guidance tools can provide financial benefits beyond savings and investment advice, such as guidance on when to retire, when and how to claim Social Security benefits, and how to invest and draw down assets in a tax-efficient manner.

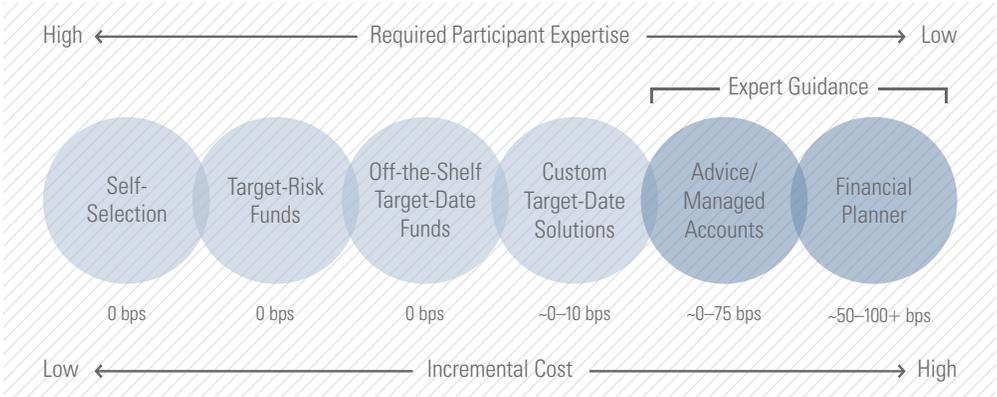
Expert Guidance

A growing body of literature suggests most Americans lack both the ability and desire to understand how to optimally save for retirement, as well as how to invest those monies. While education may be a potential solution for some individuals, there will still be some remaining fraction, likely a majority, who will want either assistance making these decisions or potentially someone else to make these decisions for them. In this paper this assistance is referred to as “Expert Guidance,” or guidance that is customized to the unique situation of the individual and provided by an online investment advisory interface managed by an investment advisor that has specific expertise in providing savings rate, investment, and other general financial guidance to individuals.

Plan participants can receive investment advice from an array of sources (see Figure 1). Of these, two might be considered Expert Advice: individual meetings with the plan advisor and a managed accounts or advice service. Although meeting with a plan adviser perhaps would be optimal, this would likely incur significant costs, making it an impractical solution. Thus, this paper focuses on and defines Expert Guidance as that provided by an online managed accounts or advice service.

Considering the array of potential investment solutions, along with the required expertise, in Figure 1, the highest level of required expertise would be for an individual who is self-selecting (i.e., self-directing) his or her account. As an individual moves to the right in the spectrum, the level of required expertise decreases, however the cost tends to increase. The goal of this paper is to provide some context around the potential benefits of Expert Guidance that can be weighed against the potential costs of providing the service. While both off-the-shelf and custom target-date solutions are generally superior to self-selection, an individualized recommendation for the plan participant is not delivered or executed. As such, Expert Guidance focuses only on those options that provide individualized recommendations and excludes target-date solutions. While the benefits of Expert Guidance are proxied using a specific dataset, which is expanded on more fully in the following section, we would expect the similar benefits to extend to other types of services and platforms that provide advice to retirement plan individuals.

Figure 1: Investment Advice Spectrum



Data Set

The data for this analysis is based on participants who utilized the Morningstar Retirement Manager service, either for managed accounts or advice, from January 2006 to February 2014. These individuals primarily access the service through an employer-sponsored defined contribution plan, such as a 401(k) plan. For individuals not familiar with the two services, managed accounts provide discretionary ongoing asset allocation and retirement advice for participants, while advice is usually a nondiscretionary point-in-time service that provides asset allocation and savings recommendations.

A number of filters were applied to the available data set. First, there must be available data on the age, compensation, savings rate (both before and after receiving Expert Guidance), and income to be included. Second, the individual must have a minimum annual compensation of \$10,000. Third, the individual must have a nonzero deferral rate before and after the Morningstar Retirement Manager session, and the relative change in the deferral rate cannot be greater than 25% (e.g., a participant who was deferring 5% before the session and changed the savings rate to 40% would be excluded). Fourth, data on the employer matching contribution rate must be available. Fifth, the individual must be provided with an opportunity to change both the deferral rate and investment allocations. These filters resulted in 58,444 individuals over the period, based on potential sample of over 500,000 participants. The actual number of individuals varies among the different tests performed based on data availability, which is described more fully in the applicable sections.

The analysis is based on actual changes in deferral rates and investment allocations. In many cases the decisions by the participant differed significantly from the Expert Guidance recommendation. Balance and income values are adjusted to January 2014 dollars based on the monthly change in the Consumer Price Index for Urban Consumers.

Savings Impact

In this section the impact of Expert Guidance on individual savings decisions is explored. Americans, as a group, are not good savers. Some journalists, academics, and politicians have gone as far to call the lack of savings by Americans a “crisis.” The implications of this lack of savings are likely to become increasingly significant as more Americans self-fund retirement through DC retirement plans.

Two well-cited problems with DC plans are that, first, the participant must actively save (i.e., defer income into the 401(k) plan), and second, if the participant decides to save, he or she must figure out the optimal amount. While the introduction of various automatic enrollment provisions introduced as part of the Pension Protection Act of 2006 may help increase the number of individuals participating in company-sponsored DC plans, many individuals don’t know how much they should be saving for retirement. Most participants faced with a decision between saving for the future and current spending needs frequently opt for the latter.

Change in Participant Deferral Rates

Expert Guidance has the potential to improve savings because it provides individuals with customized recommendations about the required amount of savings necessary to achieve their retirement goals. Although many individuals feel that a 6% deferral rate is enough to fund a full retirement, most people may actually need to save significantly more. While an individual can choose not to follow the recommendation provided by Expert Guidance, it is worth exploring the impact Expert Guidance has had on savings rates in the available data set. Figure 2 shows the average deferral rates before and after receiving Expert Guidance by participant age, along with the average change in deferral rate for each age.

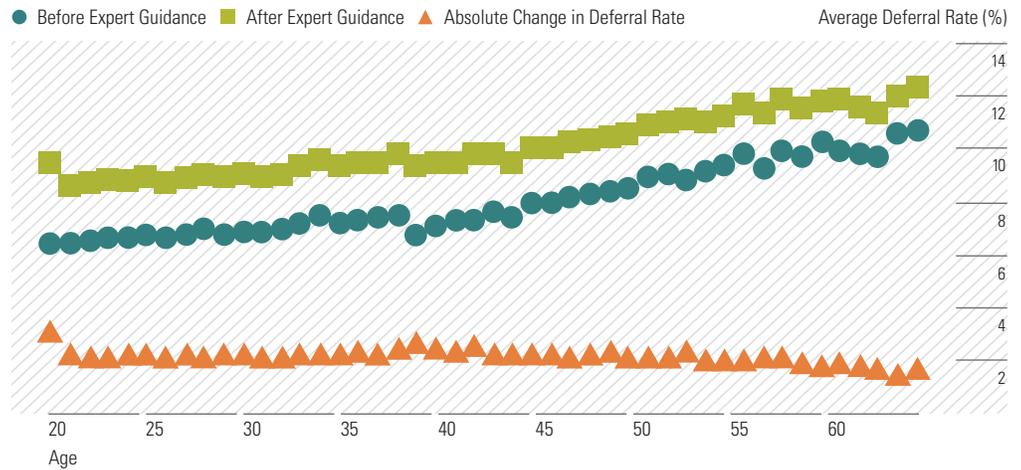
On average, deferral rates across all participants increased 2.19¹ percentage points to 10.14% (from 7.95%), which represents a relative increase of 27.65%. The median increase was 2.00 percentage points. Based on the data in Figure 2, changes in deferral rates were clearly slightly higher for younger participants than older participants. Across all participants, 86.80% increased their deferral rates; 10.75% kept their savings rate the same; and 2.45% of participants decreased their savings rates.

Next, the changes in absolute and relative deferral rates are broken down for different age and income groups. The absolute change is the percentage-point change in the deferral rate. For example, if a participant was saving 5.00% before receiving Expert Guidance and 7.00% afterward,

¹ The t statistic for the difference is over 200. The vast majority of tests are significant at the 0.01% level. Information about statistical significance is only provided if the differences are not significant at the 1% level.

the absolute change would be 2.00 percentage points. The relative change is the deferral rate after Expert Guidance divided by the deferral rate before Expert Guidance. Using the previous example (5.00% before, 7.00% after) the relative change would be 40 percentage points.

Figure 2: Average Deferral Rates by Age, Before and After Expert Guidance



The age groups are in five-year increments, except for the first group—ages 20 to 25—which is six years. The income groups are separated into quintiles by age. The median compensation for each age of each quintile group is included in Appendix 1 for reference. Table 1 includes the changes in deferral rates for each of the different age and income groups considered for the analysis. Note that there may be participants included in the overall analysis that fall outside of these groups.

Table 1: Change in Deferral Rates by Age and Income Groups

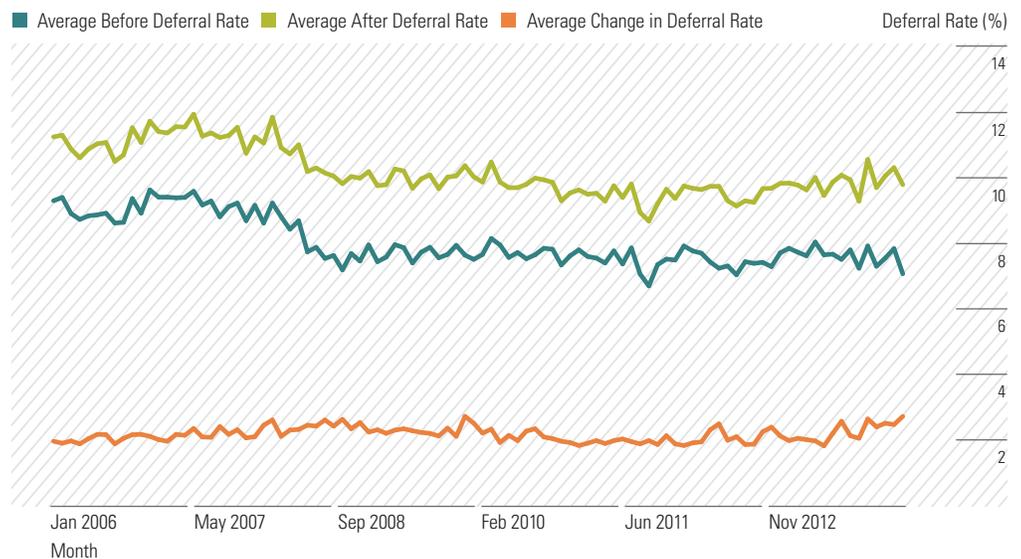
Panel A: Average Absolute Deferral Rate Change							Panel B: Average Relative Deferral Rate Change						
Age	Income Quintile (%)					Avg	Income Quintile (%)					Avg	
	1	2	3	4	5		1	2	3	4	5		
20–25	2.32	2.27	2.11	2.08	2.36	2.23	69.93	58.51	46.26	43.49	46.47	52.93	
26–30	2.36	2.20	2.19	2.21	2.09	2.21	67.92	58.76	49.32	43.66	39.01	51.74	
31–35	2.22	2.31	2.41	2.12	1.92	2.20	64.70	53.07	52.78	41.46	37.06	49.81	
36–40	2.80	2.55	2.51	2.34	2.04	2.45	73.55	62.82	51.13	45.37	38.29	54.23	
41–45	2.49	2.66	2.34	2.25	1.79	2.31	69.53	68.53	49.62	42.90	33.07	52.73	
46–50	2.38	2.40	2.30	2.13	1.80	2.20	56.95	49.55	44.10	37.01	33.93	44.31	
51–55	2.37	2.33	2.60	1.93	1.31	2.11	50.58	45.68	78.46	35.70	27.00	47.48	
56–60	2.27	2.23	2.02	1.92	1.44	1.98	43.40	35.66	33.91	32.83	31.47	35.45	
61–65	1.98	1.90	1.95	1.91	1.18	1.78	35.98	32.07	29.78	33.07	26.19	31.42	
Average	2.36	2.32	2.27	2.10	1.77		59.17	51.63	48.37	39.50	34.72		

The actual benefit realized from Expert Guidance varied by different ages and income levels. Lower income and younger participants tended to increase deferral rates by both a higher absolute and relative percentage when compared to older and higher income individuals after receiving Expert Guidance. For example, the average deferral rates for individuals in the lowest income quintile from the ages of 20 to 25 increased 2.32 percentage points to 7.73%, a relative increase of 69.93%, while the average deferral rates for individuals in the highest income quintile from the ages of 61 and 65 rose just 1.18 percentage points to 10.17%, an improvement of 26.19%.

Change in Deferral Rates Over Time

Figure 3 provides a look at how deferral rates have changed over time. While the 2.19% improvement in absolute deferral rates was relatively constant over the test period, deferral rates were actually highest at the beginning of the period, hovering around 9% before Expert Guidance and around 11% after Expert Guidance. The deferral rates drop to approximately 8% and 10%, respectively, in January 2008 and remain at approximately that level for the remainder of the study period. While there are likely a variety of explanations as to why deferral rates dropped after January 2008, one potential reason for the change was due to the effects of the global financial crisis, which was marked by job losses and wage cuts. The persistence of the deferral rate improvement's size across the period suggests it is somewhat independent from relative economic factors.

Figure 3: Change in Average Deferral Rates over Time



Change in Employer Match Contributions

Participant deferral rates are only one part of the story when it comes to investing in defined contribution plans. Many DC plans offer some kind of match formula, where the employer will match employee (participant) deferrals at a given rate. One of the most common matching formulas is 50%

on the first 6% of deferrals. Under such an arrangement, a participant deferring 3% would get a 1.5% employer match, while a participant deferring 6% would get the full employer match of 3%. In the previous example, higher deferral rates have the double potential benefit of increasing both the amount the individual is saving as well as the amount the employer contributes to that individual's account. Table 2 includes information on the absolute and relative change in employer match contributions by age and income groups.

Table 2: Change in Employer Match Contributions by Age and Income Groups

Panel A: Average Absolute Contribution Change							Panel B: Average Relative Contribution Change					
Age	Income Quintile (%)					Avg	Income Quintile (%)					Avg
	1	2	3	4	5		1	2	3	4	5	
20–25	0.49	0.36	0.25	0.19	0.18	0.29	43.05	27.50	17.59	17.56	22.44	25.63
26–30	0.50	0.33	0.28	0.19	0.19	0.30	46.04	35.59	24.57	17.19	15.15	27.71
31–35	0.42	0.34	0.27	0.18	0.17	0.28	41.61	27.16	27.50	16.40	11.95	24.92
36–40	0.83	0.58	0.32	0.25	0.20	0.44	41.50	38.33	23.42	17.25	13.72	26.84
41–45	0.53	0.78	0.27	0.18	0.15	0.38	42.83	47.20	26.41	16.78	11.76	29.00
46–50	0.38	0.32	0.19	0.17	0.14	0.24	27.89	22.31	18.25	13.59	10.80	18.57
51–55	0.26	0.21	0.20	0.14	0.10	0.18	22.34	21.51	29.21	12.14	9.56	18.95
56–60	0.23	0.20	0.13	0.09	0.13	0.16	17.94	13.51	12.31	8.55	12.44	12.95
61–65	0.18	0.16	0.09	0.09	0.10	0.12	12.66	12.90	8.50	8.37	8.85	10.26
Average	0.43	0.36	0.22	0.17	0.15		32.87	27.34	20.86	14.20	12.96	

Employer matching contributions increased by 0.28 percentage points, on average, to 3.03% after receiving Expert Guidance, a relative increase of 9.78%. Again, the relative and absolute impacts were much greater for younger and lower-income participants. The absolute improvement in the employer match contribution was roughly five times for the younger and lower-income participants when compared to the older and higher-income participants (0.50 percentage point to 0.10 percentage point). This can be attributed to the fact employer match contributions tend to be weighted more heavily toward smaller deferral rates (e.g., 50% of the first 6% of deferrals), which is why the relative benefit is so much greater for younger and lower-income participants.

Worth noting is that among participants in plans that offer an employer matching contribution, 77.69% deferred the amount required to receive the maximum employer match before receiving Expert Guidance, while 92.42% deferred the maximum matching level after receiving Expert Guidance. This suggests Expert Guidance led to more participants receiving employer contributions, which explains the results noted in Table 2.

Change in Total Savings Rates

Combing the changes in deferral rates and employer contributions provides some perspective on the total change in savings rates, before and after Expert Guidance. These values are included in Table 3, similar to Tables 1 and 2, both on absolute and relative bases.

Table 3: Change in Total Savings Rates by Age and Income Groups

Panel A: Average Absolute Savings Rate Change							Panel B: Average Relative Savings Rate Change						
Age	Income Quintile (%)					Avg	1	2	3	4	5	Avg	
	1	2	3	4	5								
20–25	2.81	2.63	2.35	2.26	2.54	2.52	59.13	47.53	36.73	35.77	38.43	43.52	
26–30	2.86	2.52	2.46	2.40	2.28	2.51	58.53	50.91	41.01	35.12	31.16	43.35	
31–35	2.64	2.65	2.68	2.31	2.09	2.47	55.16	44.49	44.50	33.52	28.78	41.29	
36–40	3.63	3.13	2.83	2.59	2.23	2.88	59.73	53.82	43.23	36.39	30.30	44.69	
41–45	3.02	3.44	2.61	2.43	1.94	2.69	59.41	60.26	42.15	34.72	26.35	44.58	
46–50	2.76	2.71	2.50	2.30	1.94	2.44	47.20	41.06	36.19	30.14	26.45	36.21	
51–55	2.63	2.55	2.81	2.07	1.41	2.29	41.84	38.24	61.95	28.69	21.48	38.44	
56–60	2.51	2.43	2.16	2.01	1.56	2.13	35.73	29.63	28.03	25.45	25.59	28.88	
61–65	2.16	2.06	2.05	2.00	1.28	1.91	28.78	26.97	24.11	26.14	20.42	25.28	
Average	2.78	2.68	2.49	2.26	1.92		49.50	43.66	39.77	31.77	27.66		

The total savings rates, which include both employee deferrals and employer matching contributions, increased by 2.48 percentage points to 13.18% on average. This absolute increase equals a relative increase in total savings of 23.14% ($(13.18\%/10.70\%)-1=23.14\%$). This suggests participants who have utilized Expert Guidance tend to have a total savings rate that is approximately 25% higher than before using Expert Guidance, which is a significant improvement in savings.

Portfolio Analysis

The potential benefits of Expert Guidance on investment allocations are explored in this section. The 58,444 participants included in the analysis held 5,560 unique investments, primarily mutual funds and collective trusts. It was possible to identify the exact fund or a relevant proxy² for 98.6% of all participant assets. In order to be included in the portfolio analysis section, 95% or more of the total allocation must have an identifiable ticker, in which the missing assets are assumed to be reweighted among the assets identified.

Rather than basing the investment style on a relatively broad metric like a Morningstar Category or the Morningstar Style Box™, a returns-based style analysis, or RBSA, was performed on each of the investments, which are predominately mutual funds. RBSA was first introduced by William Sharpe³ as a low-cost solution to analyzing mutual funds when compared to holdings-based style analysis (HBSA). The concept behind RBSA is best paraphrased by the folk saying (used by Sharpe in his original research paper), “if it acts like a duck, assume it’s a duck.” RBSA uses constrained optimization to classify an investment by comparing its performance to a number of passive benchmark indexes. RBSA searches for some combination of index returns that best mimics the portfolio performance over the test period, by minimizing the variance of the residuals.

The index proxies used for the RBSA vary based on the broad asset class of each investment, as defined by Morningstar, as noted in Appendices 2 and 3. The RBSA is based on the 36 monthly rolling returns for the year-end before using Expert Guidance. For example, the fund allocations for a participant who received Expert Guidance on March 12, 2011, would be based on the weights as of December 31, 2010 (based on the previous 36-month returns). The Morningstar Category Average value is used as a substitute for those investments that did not have available historical returns for the entire period.

Once the style weights are determined for each fund, some overall metrics are calculated for each participant. The first statistic is the total allocation to equities. This is simply the sum of the weights to all noncash and nonbond asset classes (i.e., the equity weight includes an allocation to commodities). Next, the expected return and standard deviation are based on generalizations of past Ibbotson Associates forecasts over the historical analysis period, while correlations are based on the monthly returns of the respective indexes from to January 2004 to December 2014. The return and standard deviation values used for the expectations estimates are included in Appendix 3, while the correlations can be obtained by contacting the author.

² The proxy is only used when the fund cannot be uniquely identified.

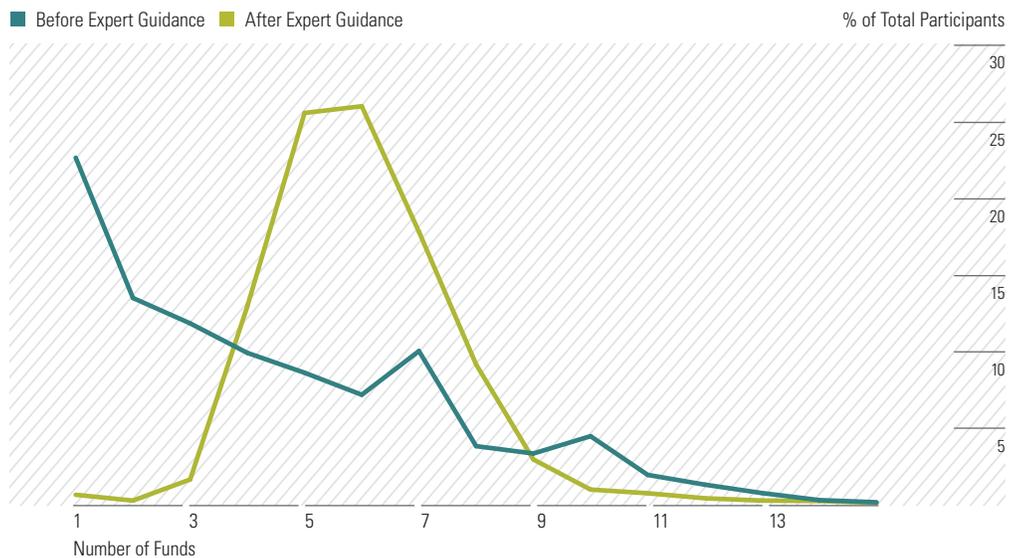
³ Sharpe, William F. 1988. “Determining a Fund’s Effective Asset Mix.” *Investment Management Review*, vol. 2, no. 6 (November/ December): 59-69.

Portfolio Efficiency

The first test is to see how efficient the portfolios are for “do-it-yourself” participants (referred to as DIYs). These DIYs are defined as participants who have an allocation of 20% or less to an investment classified as an “Allocation” fund by Morningstar. Allocation funds include things like target-date funds, which essentially represent some type of “prepackaged” investment solution where holding a single fund can actually result in a diversified portfolio.

While the percentage of participants selecting allocations to the different available investment options has decreased since the introduction of Qualified Default Investment Alternatives as part of the Pension Protection Act of 2006, there are still a significant number of participants who choose to build portfolios on their own. When discussing the potential benefits of Expert Guidance, it makes sense to first explore these participants because they are the ones who may benefit the most from Expert Guidance. The first analysis is simply looking at the number of funds held by each DIY investor, with the results included in Figure 4.

Figure 4: Number of Funds Held by Do-It-Yourself Investors Before and After Expert Guidance

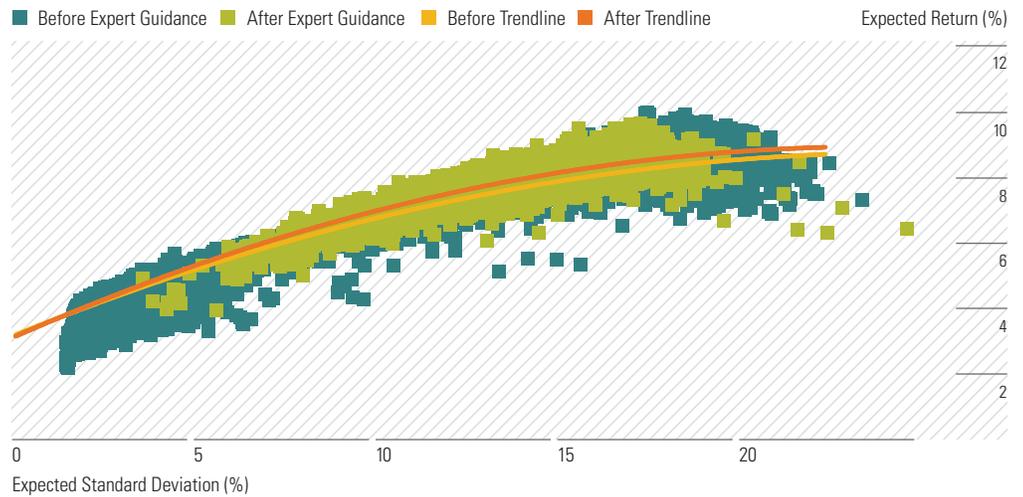


Among DIY participants, 48.07% held three or fewer funds, of which 22.69% held only one fund. This suggests most participants who choose to self-direct their accounts may not have diversified portfolio allocations.

Next, it's possible to compare the relative efficiency for the DIY portfolios against the portfolio implemented after receiving Expert Guidance. This is accomplished by combining the different weights to the asset classes for each investment, as determined by the RBSA, and then applying

those weights to generic expected return and risk values, as noted in Appendix 3. The results of this analysis are depicted in Figure 5, along with polynomial trendlines for each series.

Figure 5: Expected Return and Expected Standard Deviation of Allocations Before and After Expert Guidance for Do-It-Yourself Investors

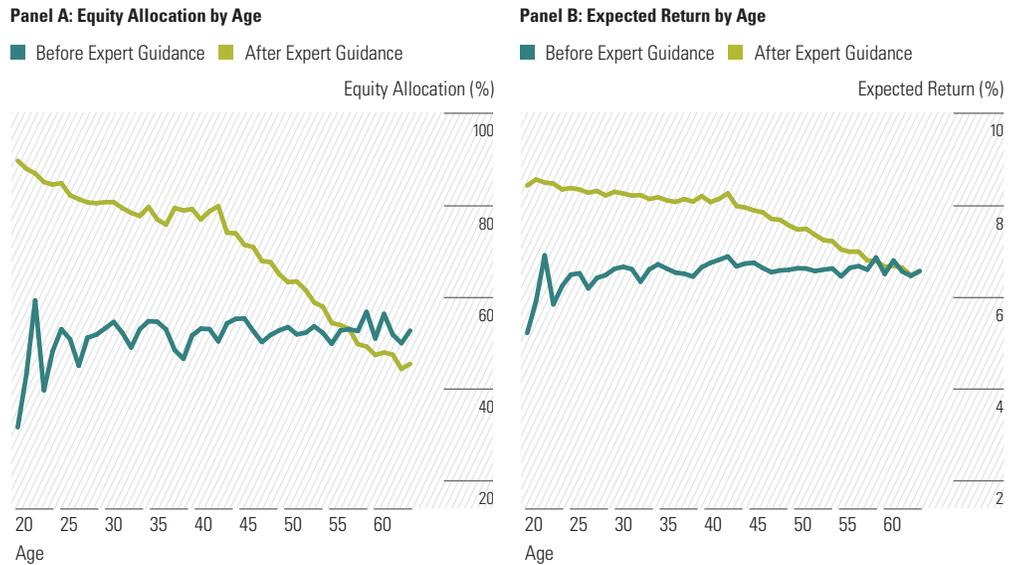


The average portfolio allocation after Expert Guidance has an expected risk-adjusted return that is 0.25 percentage point higher than the average portfolio allocation before Expert Guidance for DIY investors. In other words, DIY investors have less efficient portfolios. These findings are not surprising, though, given the relatively undiversified portfolios noted in Figure 4, where approximately half of DIY participants held three or fewer funds before Expert Guidance. It is important to note that this analysis did not include any potential fees for Expert Guidance. Fees will be addressed in a later section because they vary by investor, funds, and costs associated with implementing the Expert Guidance solution.

Risk and Return by Age

Next, the differences in the total equity allocation and expected returns are estimated for participants before and after Expert Guidance. This analysis, along with each of the remaining studies, includes all participants using Expert Guidance and is not limited to just DIY participants. The equity allocation by age is included in Panel A of Figure 6, while the expected return by age is included in Panel B.

Figure 6: Equity Allocation by Age and Expected Return by Age, Before and After Expert Guidance



While the equity allocation after Expert Guidance forms a glidepath that is common in target-date funds, the equity allocation before Expert Guidance is relatively flat, hovering at approximately 50% equities (versus an average equity allocation of approximately 70% after Expert Guidance). This suggests the before-guidance equity allocations are not well-calibrated to the level of equity risk commonly recommended in target-date funds. For example, if it is assumed that the target equity allocation is 100% minus the participant’s age (e.g., a 50-year-old participant would have an equity allocation of 50%), only 41.99% of the equity allocations before Expert Guidance would fall within 20% on either side of the target allocation, while 72.79% of participant equity allocations would do so after Expert Guidance. This suggests the majority of allocations before Expert Guidance may not be suitable given general target equity allocations.

Panel B of Figure 6 demonstrates that the expected return is higher for participants after using Expert Guidance versus before. The difference in performance is the largest for younger participants, averaging approximately 2.00% higher per year. In contrast, there is no meaningful difference in the expected returns for individuals over the age of 60. This is explained by the fact that as the participant nears retirement, the equity allocation begins to taper until it meets the equity allocation of a DIY participants approximately around age 57. The average annual expected increase in return is 1.23 percentage points. It is important to note that this analysis did not include any potential fees for Expert Guidance. Fees will be addressed in a later section.

Hypothetical Future Returns Analysis

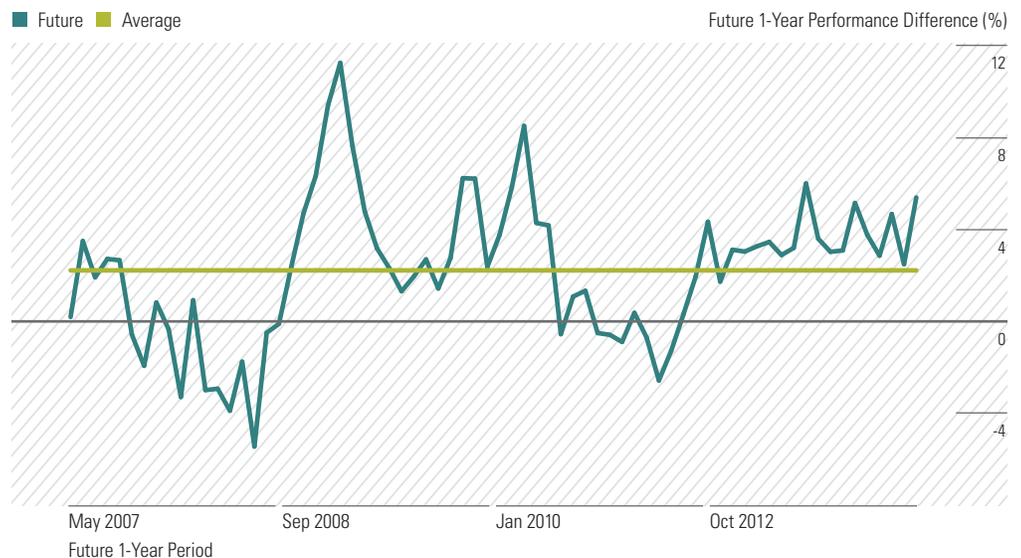
In this section, an analysis is conducted to determine the hypothetical difference in performance a participant might have experienced holding the same portfolio a year following the Expert Guidance

recommendation. It is impossible to know if the participant would have held the same pre-Expert Guidance allocation over the following year, as well as if the actual implemented allocation after receiving Expert Guidance was held for an entire year; therefore, this analysis should be viewed as hypothetical. However, it does provide some perspective as to whether the Expert Guidance recommendations are resulting in higher or lower returns in the short term for users.

For the hypothetical future total returns analysis, the future one-year performance of the actual investments (i.e., mutual funds) held by the participant is estimated based on the fund-specific portfolio allocations both before and after receiving Expert Guidance. Therefore, while the performance is the actual total return performance of the underlying holdings, the analysis is deemed to be “hypothetical” because it is impossible to know whether the individual would have held the same allocation over that future period.

The future one-year period is based on the beginning of the month following the use of Expert Guidance for the next one-year period. For example, if a participant received Expert Guidance on Dec. 17, 2008, the future one-year period would be from Jan. 1, 2009, to Dec. 31, 2009. Performance must be available for all investments held by participants, both before and after receiving Expert Guidance, to be included in the analysis. For each participant the difference in returns is estimated by subtracting the future one-year hypothetical performance for the allocation before receiving Expert Guidance from the allocation implemented after receiving Expert Guidance. A positive number suggests the participant would have had a higher return as a result of changing the allocation while a negative return would imply the opposite. The results are averaged by month and included in Figure 7.

Figure 7: Average Future-Year Hypothetical Performance Difference Over Time

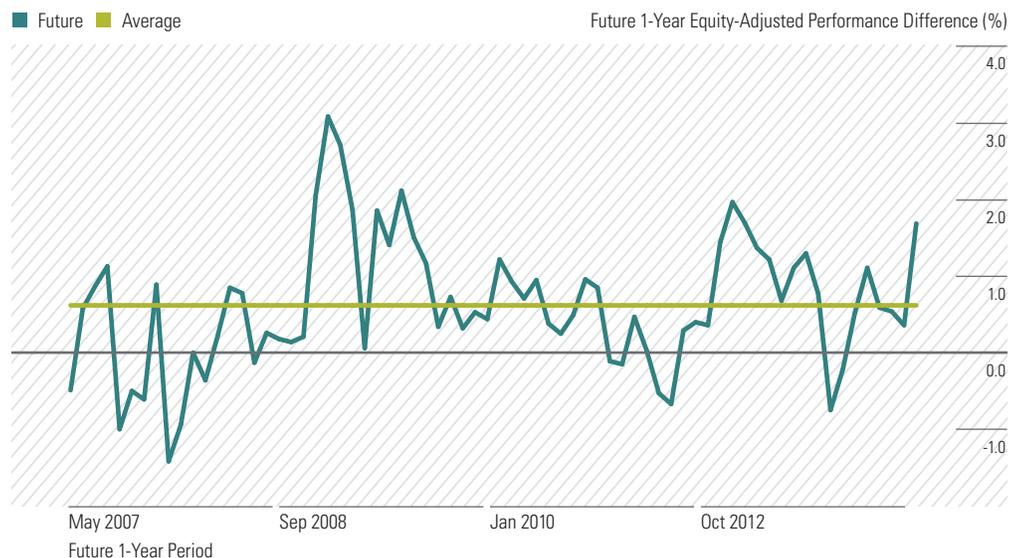


Over the historical period the allocation recommendation from Expert Guidance resulted in a hypothetical future one-year average return that was 2.22 percentage points higher over the following year when compared to the allocation before Expert Guidance. These findings suggest that participants might have realized an increase in performance from using Expert Guidance. It is worth noting that the performance difference for the year before Expert Guidance was relatively similar, where the allocation after Expert Guidance only outperformed the allocation before Expert Guidance by 0.25 percentage point per year (with a t-statistic of 2.03).

Given the higher relative equity allocations for participants after using Expert Guidance (~70% versus ~50%) and the higher return of equities over the period relative to bonds, the fact the returns after using Expert Guidance are higher is not all that surprising. The higher relative outperformance should be expected; therefore, while it is notable, an additional analysis is necessary to determine whether the hypothetical difference in future performance is based entirely on having riskier portfolios or if the portfolios may be more efficient.

The second hypothetical future returns analysis builds off the first analysis but attempts to adjust the performance differences for the different levels of equity risks within the recommendations. For the second analysis, the hypothetical future return of a proxy portfolio is subtracted from the hypothetical future return, based on the respective equity allocation. This would adjust for the fact a more aggressive portfolio may outperform when markets do better in the future, and vice versa. For each allocation the proxy portfolio is based on the future one-year performance for the Russell 3000 for the equity piece, and the future return of the Barclays Aggregate Bond Index for the non-equity piece. The results of the analysis are included in Figure 8.

Figure 8: Average Future 1-Year Hypothetical Risk-Adjusted Future Performance Difference Over Time

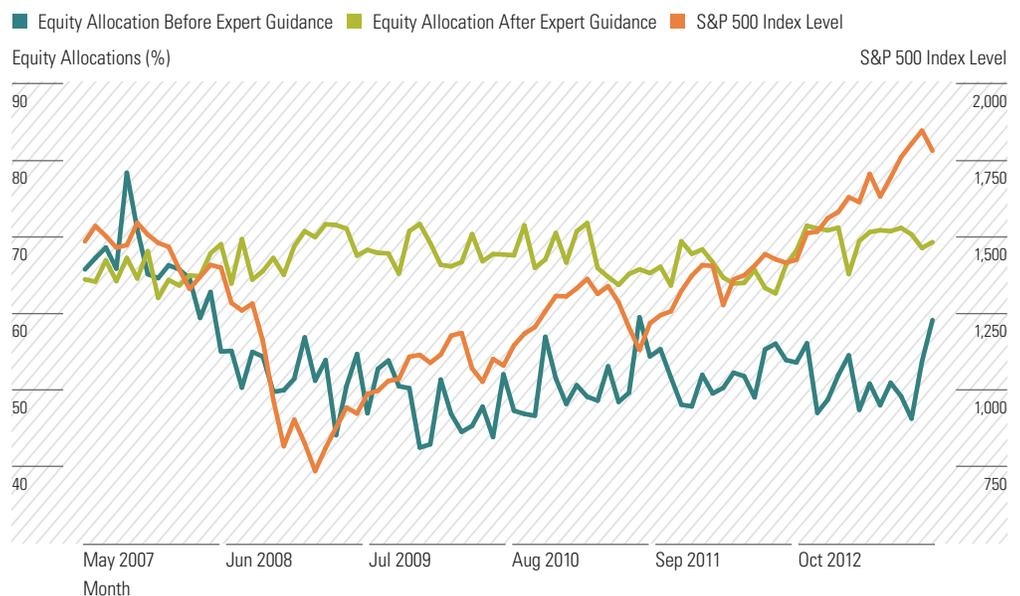


The results in Figure 8 suggest that even after adjusting for risk, the hypothetical future one-year performance of the portfolio allocations after Expert Guidance outperform the allocations before Expert Guidance. The risk-adjusted average annual future one-year outperformance is 0.62 percentage points. Therefore, even after adjusting for the higher risk (i.e., equity) level of the Expert Guidance recommendations, the participant was still better off holding the portfolio following Expert Guidance versus the pre-Expert Guidance portfolio.

Investment Behaviors Over Time

In the previous section the changes in portfolio allocations for users of Expert Guidance were explored. In this section, the investment behaviors of participants over time before Expert Guidance are explored. The objective is to provide some insight as to the decisions investors made over varying market conditions. First, the average equity allocation over time is reviewed and compared to the value of the S&P 500 Index. This analysis is included in Figure 9.

Figure 9: Time-Varying Equity Allocations Before Expert Guidance and the S&P 500 Index Level

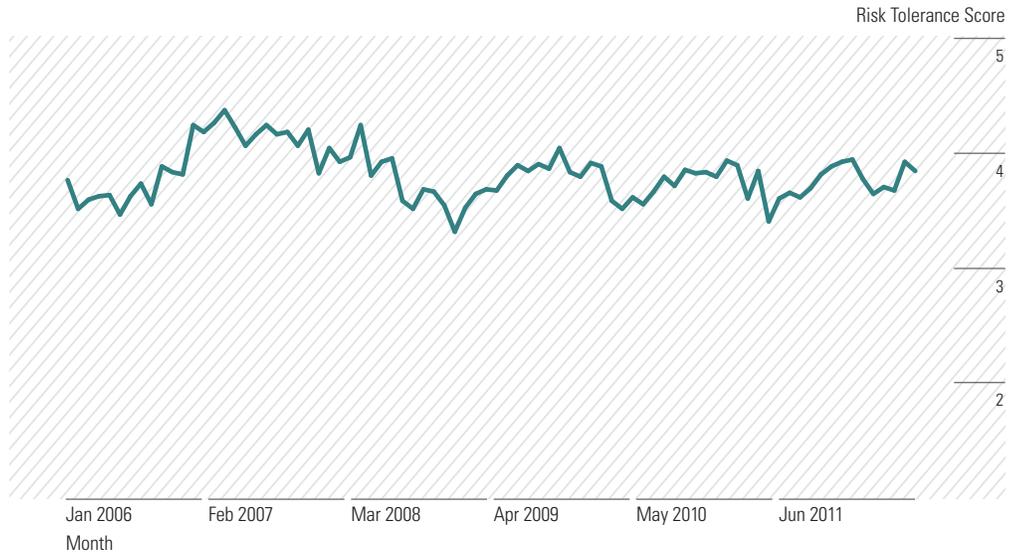


There is a relatively clear pattern in Figure 9, where the equity allocations for participants before Expert Guidance were relatively high before the 2008 global financial crisis. As the stock market declined in value, the equity allocations of participants declined as well. However, as the market recovered, the equity allocations of participants did not rebound with market values. This suggests participants incurred the market losses but did not benefit from market gains. In other words, participants did not do a very good job of changing their allocations or risk tolerance over time. This provides an explanation for the outperformance noted in the previous sections.

An RTQ is also available for participants should they choose to complete it as part of the Expert Guidance provided in this study. The results of the participants who did complete the RTQ were analyzed. This group of participants was slightly different than the primary dataset used for the analysis because only the resulting score of the RTQ is important. There is available data on 60,801 users who took the RTQ from

January 2006 to October 2012. The responses of the RTQ result in scores from 0 to 6, where 0 would be an individual who is not risk-tolerant at all (i.e., highly risk-averse) while a score of 6 would be for an individual who is very risk-tolerant (i.e., highly risk-seeking). The average monthly results of the RTQ scores are included in Figure 10.

Figure 10: Time-Varying Risk Tolerance



In Figure 10, the RTQ scores clearly were not constant over time. This finding is consistent with the growing body of research on time-varying risk aversion and has important implications when building portfolios. For example, if the RTQ is used as a primary method for portfolio assignment, an individual who completed an RTQ in February 2007 may end up with a very different portfolio than if that same individual took the RTQ in February 2009. Therefore, while risk preference, as identified through a tool such as an RTQ, is an important consideration when determining the correct portfolio for a participant, it should likely be a secondary or tertiary overlay and not the primary driver, because participants appear to have risk tolerance that varies over time.

Net Impact of Expert Guidance

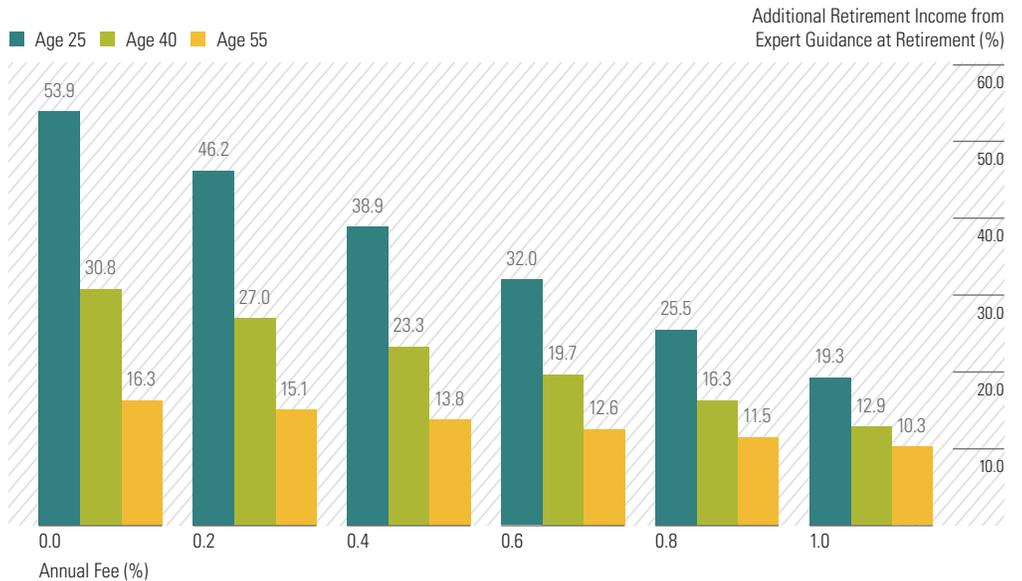
The impact of Expert Guidance on savings and investment outcomes has been explored independently so far in this paper. In this section, the potential net impact of Expert Guidance is determined by combining the noted differences in savings and investing behaviors for individuals who have utilized Expert Guidance based on two different approaches. The first approach estimates the potential benefit of Expert Guidance at the aggregate level, focusing on average differences, while the second approach looks at the impact for individual participants.

Aggregate Impact

For the aggregate analysis, the average differences in savings are determined for each age, which is similar to differences included in Figure 3, and applied to the median income values for each age based on the value for the Moderate Income Group in Appendix 1. The returns are based on the values in Panel B of Figure 6, which is the average return before and after Expert Guidance by age. The individual is assumed to retire at age 65 and the initial account value is \$0. The final account values are then compared at retirement. The analysis is conducted for participant ages of 25, 40, and 55.

As part of the analysis to determine the net impact of Expert Guidance, an annual fee is included, ranging from 0.0% (i.e., no cost) to 1.0% per year, in 0.2% increments. The fee is assumed to be charged to the entire balance of the account each year until retirement.

Figure 11: Potential Change in Retirement Income Resulting from Differing Fee Levels of Expert Guidance



The actual fee a participant will pay for Expert Guidance will vary by provider, but there is generally some type of cost; therefore, it's important to include the cost when attempting to determine the overall potential net impact, or relative benefit, of Expert Guidance. The results of the analysis are included in Figure 11.

Not surprisingly, the potential benefit of Expert Guidance varies by fee and by age; however, the benefit is always positive and can be reasonably significant. For example, the average 25-year-old participant would realize 53.91% more retirement income from an Expert Guidance service with no annual fee and an increase of 19.34% from an Expert Guidance service with a 1.0% annual fee, based on this analysis. If the participant were to withdrawal 4% of the balance during the first year of retirement (i.e., follow the "4% Rule") these improvements would result in an increase in annual retirement income of \$28,921 and \$10,375, respectively.

Individual Impact

The previous analysis focused on the average impact of Expert Guidance, while now the impact at the individual level is analyzed. The impact is determined by the changes resulting from using Expert Guidance, which include estimating the expected balance at retirement for each participant, the savings rates, and assumed portfolio return. The total savings rates, include employee deferrals and employer contributions (i.e., the values aggregated in Panel B of Table 3) and the expected returns are based off the expected returns at the asset class level (i.e., the values in Panel B of Figure 6) and do not reflect any potential improvements from better timing or more efficient mutual fund selection.

For the analysis, the assumed retirement age is 65 for all participants, and all forecasts are in real terms (i.e., converted into today's dollars). The respective total savings rates are applied to the current compensation and the account balance is assumed to grow, along with future contributions, based on the expected returns for the before and after Expert Guidance asset allocation recommendations. The before and after asset allocation returns are based on the asset class expected returns noted in Appendix 3. The differences in before and after Expert Guidance savings rates and returns are assumed to persist at the same level they were upon implementing/receiving Expert Guidance.

Similar to Figure 11, six different assumed annual fee levels for Expert Guidance are assumed, from 0.0% to 1.0% in 0.2% increments. These fees are assessed annually to the total portfolio value. The results are grouped in nine different ages groups, from age 20 to 65, primarily in five year increments. For each group, the average probability of having more wealth at retirement based on the impact of Expert Guidance and the median increase in wealth at retirement as result of Expert Guidance is determined. The results are included in Table 4, as Panels A and B, respectively.

Table 4: Individual Participant Impact of Expert Guidance

Age	Panel A: Probability of More Wealth at Retirement						Panel B: Median Increase in Wealth at Retirement					
	Expert Guidance Fee (%)						Expert Guidance Fee (%)					
	0.0	0.2	0.4	0.6	0.8	1.0	0.0	0.2	0.4	0.6	0.8	1.0
20–25	92.6	90.8	88.8	86.3	82.9	80.3	105.3	105.3	94.2	83.3	72.2	62.6
26–30	89.1	87.0	83.9	81.4	77.9	74.7	84.4	84.4	75.2	66.4	58.1	50.4
31–35	86.4	84.2	81.0	76.8	73.5	69.3	62.0	62.0	54.5	48.2	41.8	35.7
36–40	86.6	84.8	82.5	80.0	77.1	74.4	62.3	62.3	56.1	50.2	44.6	38.7
41–45	86.0	83.6	80.5	78.2	75.3	70.7	42.3	42.3	37.7	33.5	29.2	25.2
46–50	73.9	70.8	68.3	65.5	63.1	61.0	26.2	26.2	23.0	20.0	16.9	14.0
51–55	68.9	65.5	62.9	60.0	57.7	54.2	12.3	12.3	10.3	8.3	6.5	4.5
56–60	62.0	59.0	56.1	54.7	52.6	50.2	5.9	5.9	4.8	3.6	2.5	1.2
61–65	62.4	59.6	57.5	55.4	54.4	53.3	0.3	0.3	0.0	0.0	0.0	0.0

Similar to the results in Figure 6, the potential benefits of Expert Guidance varied by age and fee level. Younger participants and lower fee levels resulted in both a higher probability of having more wealth at retirement as well as higher median increases in wealth. For example, for an individual who is 25 years old, there is an 88.8% chance that he or she would be better off with Expert Guidance, assuming a .4% annual fee, and the median increase in wealth at retirement was 94.2%.

Additional Potential Improvements

While the results noted in this section are noteworthy, approximating the value of Expert Guidance based entirely on changes in savings rates and investment allocations is an incomplete perspective. This is because Expert Guidance tools can provide benefits beyond simple savings and investment recommendations, such as information about when to retire, optimal ways to claim Social Security benefits, and how to invest and draw down assets in a tax-efficient manner. Therefore, while Expert Guidance tends to result in better outcomes based solely on higher expected returns and higher savings rates, there are likely other potential benefits available to users that are not being captured in this analysis.

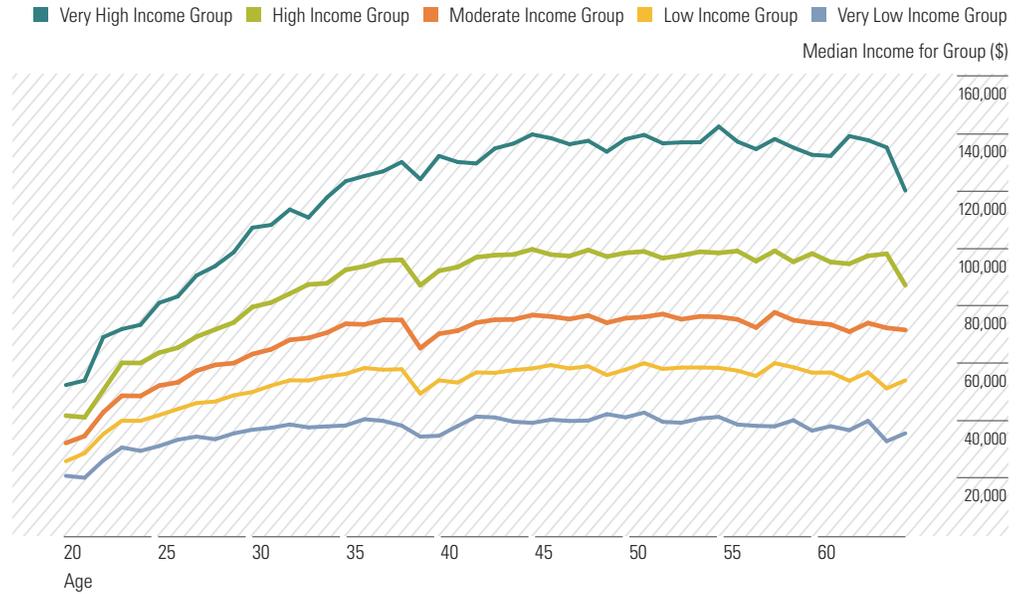
Conclusions

The analysis conducted for this paper suggests that Expert Guidance, which is defined as guidance provided to participants on optimal savings and investing decisions, can help outcomes for defined contribution plan participants. Expert Guidance can take many forms, such as from a financial planner or some type of online advice tool; however, for this analysis Expert Guidance is proxied based on the historical experience of users in Morningstar's Retirement Manager platform. Overall, users of Expert Guidance experience a total savings rate improvement of 2.48 percentage points, a relative increase of approximately 24%.

From an investment perspective, the portfolios after using Expert Guidance tended to be more efficient and had higher expected returns. When combined, a 25-year-old participant has the potential to realize 53.91% more retirement income from an Expert Guidance service with no annual fee and an increase of 19.34% for an Expert Guidance service with a 1.0% annual fee. If the participant were to withdrawal 4% of the balance during the first year of retirement (i.e., follow the "4% Rule") these improvements would result in an increase in annual retirement income of \$28,921 and \$10,375, respectively. Additionally, there is a 92.6% probability of a 25-year-old participant having more wealth at retirement as a result of Expert Guidance assuming no annual fee, and an 80.3% probability of having more wealth with a 1.0% annual fee. The median increase in wealth at retirement for a 25-year-old is 105.3% and 62.6%, respectively, for these two fee levels.

Appendices

Appendix 1: Median Compensation for the Five Income Groups by Age



Appendix 2: Asset Class Benchmarks for Returns-Based Style Analysis (RBSA)

Asset Class	Benchmark	U.S. Equity	Intl Equity	Bond	Alloc	Alt	Comm	Sector Stock	Money Market	Stable Value
Cash	IA SBBI US 30 Day TBill									
Short Bond	Barclays US Govt/Credit 1-3 Yr									
Intm Bond	Barclays US Govt/Credit Interm									
Long Bond	Barclays US Govt/Credit Long									
Agg Bond	Barclays US Agg Bond									
TIPS	Barclays USeasury US TIPS									
High Yield	Barclays US Corporate High Yield									
NonUS Bond	Citi WGBI NonUSD USD									
EM Bond	JPM EMBI Plus									
Stable Value	Galliard Stable Value Composite									
US Market	Russell 3000									
US Large Growth	Russell 1000 Growth									
US Large Value	Russell 1000 Value									
US Mid Growth	Russell Mid Cap Growth									
US Mid Value	Russell Mid Cap Value									
US Small Growth	Russell 2000 Growth									
US Small Value	Russell 2000 Value									
US REITs	FTSE EPRA/NAREIT Dvlp Ex US									
NonUS REITs	FTSE NAREIT All Equity REITs									
NonUS Large	MSCI EAFE									
NonUS Growth	MSCI EAFE Growth									
NonUS Value	MSCI EAFE Value									
NonUS Small Growth	MSCI EAFE Small Growth									
NonUS Small Value	MSCI EAFE Small Value									
EM	MSCI EM									
Commodity	DJ UBS Commodity									

Included in RBSA? Yes No

Appendix 3: Return and Standard Deviation Assumptions by Asset Class

Benchmark	Return (%)	Standard Deviation (%)
Cash	2.2	1.7
Short-term Bond	3.2	3.6
Intermediate-term Bond	3.6	5.4
Long-term Bond	4.9	10.9
Aggregate Bond	4.3	7.1
TIPS	3.7	7.1
High Yield Bond	7.9	11.3
NonUS Bond	3.7	11.2
Emerging Mkts Bond	7.0	14.4
Stable Value	3.7	2.0
US Equity Market	10.6	19.0
US Large Growth	9.6	22.1
US Large Value	11.2	17.5
US Mid Growth	11.2	23.2
US Mid Value	13.2	19.2
US Small Growth	10.7	27.6
US Small Value	14.1	22.5
US REITs	9.7	23.6
NonUS REITs	11.7	24.0
NonUS Large	10.0	20.6
NonUS Growth	8.5	21.2
NonUS Value	11.5	20.0
NonUS Small Growth	9.6	21.7
NonUS Small Value	11.9	21.2
Emerging Markets	14.0	29.7
Commodity	6.0	17.9

Disclosures

Figure 6: Panel B: Expected Return by Age

The graph illustrates the average expected return for participants, by age, before and after receiving Expert Guidance. As illustrated in Panel A, participants tend have higher allocations to equity in their portfolio after receiving Expert Guidance. Panel B illustrates how having higher allocations to equity has the potential to generate higher expected returns. The expected returns are calculated using capital market assumptions shown in Appendix 3.

Figure 7: Average Future-Year Hypothetical Future Performance Difference Over Time

The hypothetical performance presented is calculated by analyzing the difference between a participant's portfolio prior to receiving Expert Guidance ("Before Portfolio") and then comparing it to a participant's portfolio after receiving expert guidance ("After Portfolio"). Actual historical performance of the underlying funds is then applied to the Before and After Portfolios and the resulting difference is the hypothetical future one-year performance. The one-year hypothetical future performance for each participant in the analysis is then averaged to illustrate the average future one-year performance. The future one-year period is based on the beginning of the month following the use of Expert Guidance for the next one-year period. For example, if a participant received Expert Guidance on December 17, 2008, the future one-year period would be from Jan. 1, 2009, to Dec. 31, 2009. Performance must be available for all investments held by the participants, both before and after receiving Expert Guidance in order to be included in the analysis. A positive number suggests the participant would have had a higher return as a result of changing the allocation while a negative return would imply the opposite. The results are averaged by month.

For example, two participants begin using Expert Guidance on Dec. 17, 2009. The future one-year hypothetical time period would be Jan. 1, 2009 through Dec. 31, 2009. The hypothetical one-year Before and After Portfolio performance for Participant A is 6% and 8%, respectively. The hypothetical one-year Before and After Portfolio performance for Participant B is 4% and 3%, respectively. The difference between the Before and After Portfolios performance is 2 percentage points and -1 percentage point, respectively. The average future hypothetical one-year performance would be 0.5%

Figure 8: Average Future One-Year Hypothetical Risk-Adjusted Future Performance Difference Over Time

The hypothetical risk-adjusted performance presented builds off the same methodology shown in Figure 7. In order to calculate the risk-adjusted performance, the Before and After Portfolios are analyzed at the asset class level. The Russell 3000 is the proxy for the equity allocation and the Barclays Aggregate Bond index is the proxy for the fixed-income allocation. The proxies are used to estimate performance for Before and After Portfolios, according to their respective asset allocations.

If proxies representing the After Portfolio outperform the proxies for the Before Portfolio, the difference will be added to the hypothetical Before Portfolio from Figure 7. If the proxies for the After Portfolio underperform the proxies for the Before Portfolio, the difference will be subtracted from the Before Portfolio.

For example, the Before Portfolio provides a proxy return of 6% with an asset class split of 50% equity/50% fixed income. The After Portfolio provides a proxy return of 8% with an asset class split of 70% equity/30% fixed income. The After Portfolio outperformed the Before Portfolio by 2 percentage points. This 2 percentage points outperformance is then added to the hypothetical Before Portfolio as calculated by Participant A in Figure 7. To further the analysis from Figure 7, the Before Portfolio for Participant A would provide 8% and the After Portfolio performance would stay 8%. Figure 8 follows this calculation and averages the difference for each participant in the study.

Figure 9: Time-Varying Equity Allocations Before Expert Guidance

This graph displays the relationship between an average participant's portfolio equity allocation prior to and after receiving expert guidance and compares these allocations to the level of the S&P 500 index.

Figure 10: Time-Varying Risk Tolerance

This graph demonstrates an average participant's risk score, as proxied through a risk tolerance questionnaire, across the period analyzed. Only participants that took an RTQ were included in this analysis.

Figure 11: Potential Changes in Retirement Income Resulting from Differing Fee Levels of Expert Guidance

These graphs are intended to illustrate the effect differing fee levels have on a participant's potential savings balance at retirement after using Expert Guidance. The hypothetical participant portfolio is calculated using the difference in projected retirement income between a participant's portfolio prior to and after receiving Expert Guidance and then averaged among all participants within an age group across the period analyzed. The hypothetical participant portfolio utilizes capital market assumptions to project the potential retirement income value at the retirement age of 65. A fee is then applied to the account during accumulation projected retirement income value at various levels to demonstrate how fees impact retirement income over time.

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David M. Blanchett, CFA, CFP®, is the head of retirement research for Morningstar Investment Management. In this role, he works to enhance the group's consulting and investment services. He conducts research primarily in the areas of financial planning, tax planning, annuities, and retirement plans and he serves as the Chairman of the Advice Methodologies investment subcommittee. Prior to joining Morningstar, he was the Director of Consulting and Investment Research for the Retirement Plan Consulting Group at Unified Trust Company in Lexington, KY.

His research has been published in a variety of academic and industry journals and has been featured in media publications such as *InvestmentNews*, *Kiplinger's*, *Marketwatch*, *Money Magazine*, the *New York Times*, *PLANSPONSOR* magazine, and the *Wall Street Journal*. His research won the *Journal of Financial Planning's* 2007 Financial Frontiers Award, the Retirement Income Industry Association's 2012 Thought Leadership Award, and the *Journal of Financial Planning's* 2014 Montgomery-Warschauer Award. In 2014 *Money Magazine* named him one of the five brightest minds in retirement and *InvestmentNews* included him in their inaugural 40 under 40 list as a "visionary" for the financial planning industry. He is a RetireMentor for MarketWatch and an Expert retirement panelist for the *Wall Street Journal*.

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