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Stop Guessing 2.0 | Extending the Framework

Using Participant Data to Select the Optimal QDIA

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Executive Summary

As the availability of detailed participant data increases, so does the ability for plan sponsors to make data-driven decisions. Our first "Stop Guessing" paper[1] presented a framework for using participant data to help determine which qualified default investment alternative is most appropriate for a defined-contribution plan. This included an approach to determine which glide path best fits the demographics of the plan participants, when a custom glide path makes sense, what the "pivot" age should be for a hybrid QDIA (target-date funds for younger investors and managed accounts for older investors), and when the potentially higher cost of retirement managed accounts makes sense based on the unique demographics of a plan's participants. This baseline framework represented a dramatic leap forward in providing plan decision-makers with plan-specific, data-driven, and repeatable insights to quantify the cost benefit of various default investment options.

This paper extends the original framework, including the ability to incorporate expectations/assumptions around: 1) active management alpha; 2) a more diversified and appropriate detailed asset allocation; 3) some of the possible benefits associated with financial planning "gamma" or "advisor's alpha;" 4) the expected benefit of diversifying out of company stock; and 5) utility losses due to lack of complete information on the participant. While this enhanced framework remains data-driven and individualized, incorporating these additional factors requires an additional level of subjectivity and thus requires decision-makers to have a more thorough understanding of the methodology and assumptions. While intellectually similar in spirit, these extensions are independent of one another, allowing the practitioner to pick and choose which additional factors to include in the analysis.

[1] "Stop Guessing: Using Participant Data to Select the Optimal QDIA" by Thomas Idzorek, David Blanchett, and Daniel Bruns. Morningstar White Paper.

Introduction

Plan sponsors and plan consultants typically want to select the most appropriate or "best" qualified default investment alternative for participants from those available to them. Unfortunately, the scientific rigor of the industry's decision support analytics has been lacking, and as a result, QDIA selection has been relatively subjective. The most clear-cut quantitative number on which all can agree is investment fees. Coupling this with the backdrop of an ERISA fiduciary's obligation to act in the best interest of the plan participants has arguably had the unintended consequence of driving many plans to select the lowest-cost option, regardless of appropriateness and a full consideration of additional features that can be difficult to quantify. In some instances, selecting the lowest-cost option may even be a breach of one's fiduciary duty; yet, to date, going with the lowest-cost option has largely been considered a safe choice. Now, with the ability to measure the trade-off between appropriateness and cost, we would contend that picking the lowest-cost option without incorporating additional analysis into the fiduciary process would be a failure of duty.

To choose the most appropriate and overall "best" QDIA product after accounting for costs, plan sponsors and plan consultants need a robust framework that rigorously quantifies the costs and expected benefits of the potential options. Intuitively, many of us know that the "best value" for our money is typically not the absolute cheapest option, nor is it the most expensive option; it is typically a low-cost option that strikes the right balance between overall benefit and cost. Arguably, the "Stop Guessing" framework introduced by Idzorek, Blanchett, and Bruns (2018) took an important step forward (in this effort to find balance) by simultaneously considering the unique situation of every single plan participant, determining the ideal individual asset allocation, and then quantifying the degree to which the equity asset allocation from a given QDIA fit the ideal equity asset allocation for each individual participant. That framework is data-driven, independent, and repeatable, and it took the additional step of quantifying the cost-versus-fit trade-off, building on Harry Markowitz's portfolio utility theory applied at the individual participant level and then aggregating across the plan, allowing plan decision-makers to choose the best-fit QDIA from a high-level stock-bond or risky versus safe asset-allocation perspective.

The original "Stop Guessing" framework has led to numerous conversations and feedback requesting additional factors be considered within the context of an individualized, data-driven, quantitative, and repeatable framework. A nice feature of the original "Stop Guessing" framework was that it was completely independent and agnostic to the source of the equity allocations of the QDIA in question, leading to an independent answer. Additionally, because the analysis was carried out at the overall stock versus bond level and almost all investment professionals believe that, over long periods of time, stocks are likely to produce higher returns than bonds, the conclusions were not particularly sensitive to a given set of capital market assumptions. For those who wish to consider additional factors, we want to provide such tools and analytics in a completely transparent manner. We want to arm the plan decision-maker with a repeatable, data-driven approach that considers additional factors while clearly identifying the assumptions that were needed to arrive at the analytics.

The additional factors that plan decision-makers want to consider fall into five buckets: 1) the potential benefit of active management alpha; 2) the potential benefit of a more diversified, higher quality, and/or appropriate detailed asset allocation; 3) the potential benefits associated with embedded advice and/or financial planning "gamma" or "alpha;" 4) the potential benefit of diversifying out of company stock; and 5) the potential utility loss due to lack of information/interaction that may occur in a managed accounts setting. The desire to quantify these in a robust manner has been made by both plan sponsors and plan consultants. This article is arranged around these topics, and thus, we present potential methodologies to extend the baseline "Stop Guessing" methodology to provide analytics that attempt to quantify the cost-benefit of these additional factors.

We move forward under the assumption that the reader is familiar with the original article, "Stop Guessing: Using Plan Participant Data to Select the Optimal QDIA," but for those who are not, we provide a brief overview.

"Stop Guessing" 1.0 Overview

For those who want a quick refresher on the base framework, as put forth in Idzorek, Blanchett, and Bruns (2018), the "Stop Guessing" framework uses a retirement managed accounts advice engine, something we think of as a "financial-advisor-in-a-box," to arrive at an equity-level asset allocation for each individual plan participant. In theory, any engine (or calculator) that can determine the appropriate asset allocation for a participant (which should consider things such as age, gender, salary, savings rate, matching contributions, current defined-contribution balance, defined-benefit pensions, Social Security, retirement age, state of residence, and available information on held-away or outside assets) could be used. Then for a given QDIA, such as a target-date fund, one can compare the personalized, equity-level asset-allocation recommendation to the equity-level asset allocation the individual participant would receive from a given QDIA, such as the equity level of three potential target-date funds that the plan sponsor is considering. This enables one to quantify the degree to which an individual would be misallocated relative to the ideal asset allocation. Aggregating across all participants enables one to identify which QDIA minimizes the degree of misallocation and pick the best-fit QDIA from those options. Ignoring costs, plan sponsors should generally select the QDIA with the lowest level of misallocation—that is, the best-fit QDIA.

Turning to costs, the framework then "prices" (in annual basis points) the loss in portfolio utility that each individual is expected to incur because of the misallocation. This enables a more holistic view of a QDIA and highlights that the QDIA comes with two specific costs: 1) the explicit costs or fees of the investment option, and 2) the previously hidden cost of lost utility caused by participants being defaulted into a QDIA that results in a misallocation relative to their ideal asset allocation. Combining these two costs leads to a total cost that reflects both product fees and the degree to which a given QDIA fits the ideal asset allocation of each participant. This enables plan sponsors to have a single cost figure that simultaneously considers actual cost and the goodness of fit.

We now attempt to extend that baseline framework to consider additional factors. As with Idzorek, Blanchett, and Bruns (2018), regardless of the factors that we are comparing, we attempt to express everything in annual basis points so that everything is comparable. When using utility theory, we calculate the amount in annual basis points of alpha (negative or positive) or cost (negative or positive) that would make a given investor indifferent relative to the optimal solution at the individual level. These numbers are then aggregated across plan participants to provide data to help guide decision-making by consultants and plan committees.

Potential Benefit of Active Management Alpha

When evaluating the explicit "cost" of potential QDIAs, the original "Stop Guessing" framework focused on the explicit product/service costs in annual basis points of the competing alternatives. In the case of off-the-shelf target-date funds, this was simply the annual fee. In the case of custom target-date products, this included the underlying fund fees plus a "glide path" management overlay fee. For retirement managed accounts, this included the underlying fund fees plus a "managed accounts" overlay fee. In all scenarios, these fee estimates should be tailored to reflect the *actual* cost a given plan of a given size would have to pay. For example, custom target-date products may be cost-effective for mega plans but are likely not cost-effective for most smaller plans. Many plan sponsors and retirement plan consultants intentionally include what they believe to be best-in-breed active fund managers in a plan lineup based on the assumption that, on average and over time, positive alphas will more than offset higher relative fees.

While the original framework could be modified to accommodate such expectations, we did not specifically identify it as part of the framework. As such, here we explicitly acknowledge that the framework can incorporate alpha expectations (positive or negative) at either the individual fund level or for a product consisting of multiple funds—for example, an alpha for a target-date fund series. The most straightforward manner is for the plan decision-maker to simply specify the explicit afterfee alpha expectations for the plan's investment options as well as any additional options the plan is considering adding to the lineup.

To the degree that a plan decision-maker wants to incorporate an estimate of fund quality into the analysis but isn't quite sure how to estimate the quality of each investment option, one potential approach is to leverage the Morningstar Analyst Rating™, which is the summary expression of Morningstar's forward-looking analysis of a fund. Morningstar's Manager Research group's analysts assign Morningstar Medalist ratings on a five-tier scale with three positive ratings of Gold, Silver, and Bronze, a Neutral rating, and a Negative rating. For those funds that are not rated by an actual analyst yet have the required data points, the Morningstar Analyst Ratings could be augmented with the Morningstar Quantitative Rating™. The Morningstar Quantitative Rating tries to estimate the rating that would have been assigned had the fund been evaluated by an analyst. Then, based on the rating, one can make an explicit pre-fee alpha assumption, such as 50 basis points for Gold funds, 25 basis points for Silver funds, 5 basis points for Bronze funds, zero basis points for Neutral funds, and negative 50

basis points for Negative funds. These assumptions are more conservative than the actual performance differences noted by Ptak, Traulsen, and Li (2017) where the differences vary per estimate but average out to over 160 basis points (Gold outperformance minus Negative underperformance). These assumptions can then be coupled with the fund's annual expense ratio to arrive at afterfee expected alphas. In the case of evaluating a custom target-date product or retirement managed accounts service in which the portfolios are constructed using the investment options on the plan menu, these alpha estimates can be coupled with estimates of the fund-specific portfolios to estimate the afterfee alpha of the different portfolios.

To make this a bit more concrete, in Exhibit 1, we identify a hypothetical plan lineup in which the pre-fee alpha expectations are supplied by either the plan sponsor or plan consultant. The framework remains agnostic to the source of alpha expectations. In the absence of explicit alpha expectations, we typically set alphas to zero minus fees for this type of analysis.

Exhibit 1 Plan Sponsor Lineup With Plan Sponsor-Specified Alpha Expectations

	Fund / Manager	Active / Passive	Fee in Basis Points	Pre-Fee Alpha	AfterFee Alpha
Fund 1	US Large Cap Fund A	Passive	4	0	-4
Fund 2	US Large Cap Fund B	Active	55	100	45
Fund 3	US Mid Cap Fund A	Passive	8	0	-8
Fund 4	US Small Cap Fund A	Passive	14	0	-14
Fund 5	US Small Cap Fund B	Active	75	125	50
Fund 6	Non-US Dev. Fund A	Passive	12	0	-12
Fund 7	Emerging Market Fund A	Active	95	150	55
Fund 8	Long/Short Fund A	Active	100	200	100
Fund 9	US Bond Fund A	Passive	12	0	-12
Fund 10	US Bond Fund B	Active	37	55	18
Fund 11	Non-US Bond Fund	Active	45	60	15
Fund 12	Emerging Mkt Bond Fund	Active	61	100	39

To carry this example out a bit more, Exhibit 2 identifies the hypothetical fund-specific weights that a plan consultant seeking to serve as a 3(38) investment manager has proposed to use for a custom target-date product. For space considerations, we are only displaying 10-year increments. The most important item in this case is the final row—the afterfee weighted average alpha of each target-date vintage.

Exhibit 2 Hypothetical Fund-Specific Allocations With Weighted-Average Alpha Expectations

	Fund / Manager	2060	2050	2040	2030	2020	201
Fund 1	US Large Cap Fund A	20.0%	20.0%	20.0%	10.0%	8.0%	8.0%
Fund 2	US Large Cap Fund B	15.0%	15.0%	15.0%	12.0%	9.0%	8.0%
Fund 3	US Mid Cap Fund A	10.0%	9.0%	9.0%	6.0%	4.0%	3.5%
Fund 4	US Small Cap Fund A	2.0%	2.0%	2.0%	1.0%	1.0%	1.0%
Fund 5	US Small Cap Fund B	4.0%	4.0%	3.0%	3.0%	3.0%	3.0%
Fund 6	Non-US Dev. Fund A	27.0%	25.0%	24.0%	14.0%	13.0%	12.0%
Fund 7	Emerging Market Fund A	9.0%	9.0%	8.0%	5.0%	4.0%	3.5%
Fund 8	Long/Short Fund A	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Fund 9	US Bond Fund A	4.0%	5.0%	5.0%	23.0%	29.0%	33.0%
Fund 10	US Bond Fund B	2.0%	3.0%	3.0%	11.0%	13.0%	15.0%
Fund 11	Non-US Bond Fund	3.0%	3.0%	5.0%	8.0%	9.0%	7.0%
Fund 12	Emerging Mkt Bond Fund	1.0%	2.0%	3.0%	4.0%	4.0%	3.0%
	Equity	90.0%	87.0%	84.0%	54.0%	45.0%	42.0%
	Fixed Income	10.0%	13.0%	16.0%	46.0%	55.0%	58.0%
	Pre-Fee Weighted Average Alpha	43.4	45.0	44.4	44.1	41.3	38.
	Weighted Average Fund Fee	31.1	31.9	31.6	32.2	31.1	29.
	Glide Path Overlay Fee	5.0	5.0	5.0	5.0	5.0	5.
	Afterfee Weighted Average Alpha	**7.3**	**8.1**	**7.8**	**6.9**	**5.2**	**3.**

Presumably, the plan sponsor and/or plan consultant would want to use their explicit alpha forecasts when evaluating the fund-specific portfolios from managed accounts. Armed with this type of information, a plan sponsor would be in a good position to compare the plan consultant's proposed custom product to that of another plan consultant or to multiple off-the-shelf products while incorporating their explicit alpha forecasts.

In Exhibit 3, we illustrate what such a comparison might look like. The top rows correspond to the type of information/analysis produced from the original "Stop Guessing" framework, focusing strictly on investment costs and the utility loss caused by a high-level asset-allocation misallocation at the aggregate participant level. The concept of utility loss was introduced in the original "Stop Guessing" paper; it leverages Markowitz's framing of portfolio utility in which utility comes from portfolio return minus an investor-specific penalty for risk. In our framework, the utility loss is the amount of additional return in annual basis points that would make investors indifferent to competing choices.

In this hypothetical example, for Managed Accounts, we have assumed that the weighted average investment manager fee is 30 basis points and the Managed Accounts service fee is 45 basis points for an all-in fee of 75 basis points. Similarly, for the custom target-date products, we have assumed that the weighted average investment manager fee continues to be 30 basis points and the glide-path management fee is 7 basis points for an all-in fee of 37 basis points. Of course, when conducting such an analysis, one wouldn't use these numbers and would use the actual fees that a given plan sponsor would pay. Thus, QDIA Option C, a low-cost target-date fund, seems to be the winner (prior to incorporating utility loss and alpha expectations). As demonstrated in the bottom rows, after including the utility loss and plan sponsor's explicit alpha forecasts into the analysis, QDIA Option B and the

Custom target-date fund (QDIA Option D) are equally compelling if one incorporates expected alphas into the analysis.

Exhibit 3 All-In Cost Comparison Including Alpha Expectations

	Managed Accounts	QDIA Option A	QDIA Option B	QDIA Option C	QDIA Option D (Custom)
Investment Fees	75	35	25	8	37
Risk Level Utility Loss	0	42	40	72	35
All-In Cost / Utility Loss	75	77	65	80	72
Expected Alpha	7	10	0	0	7
All-In Cost / Utility Loss (w/ Alpha)	68	67	65	80	65

Source: Author Calculations.
Notes: Investment Fees for Managed Accounts assumes 30 basis points for weighted average fund fees and 45 basis points for Managed Accounts service fee. QDIA Option D (Custom) assumes 30 basis points for weighted average fund fees and 7 basis points for custom glide-path fee.

Potential Benefit of More Diversified, More Appropriate Detailed Asset Allocations

The original "Stop Guessing" framework focused on the amount of utility loss an individual would experience from being mapped into a QDIA with an age-based equity level that did not match the ideal equity level as determined by Morningstar Investment Management's managed accounts engine and then aggregating the results for the entire plan. The actual utility loss calculations require estimates of expected returns, standard deviation, and correlations for two asset classes: stocks and bonds. When we apply the framework, our default is to use our own capital market assumptions; however, the framework is agnostic as to the source.[2] Attempting to quantify the benefits and costs of more-detailed asset allocations requires a more detailed set of capital market assumptions. This introduces substantial subjectivity, as a product or service may appear to be the best-fit QDIA based on one set of capital assumptions and far less attractive when evaluated using a different set of capital assumptions.

In addition, while there is some degree of commonality with which different providers of potential QDIAs express detailed asset allocations, one needs to attempt to map or express each provider's detailed asset allocation in a consistent and comparable manner. This requires some form of a multifactor model in which exposures of a given investment option are analyzed and mapped into a set of common asset classes or factors. If one chooses to specify an asset allocation in factor space rather than asset-class space, further assumptions around the returns and risks of the factors will be needed. Blanchett and Kaplan (2018) puts forth one approach for identifying common factor exposures across target-date funds allowing for cross fund family comparisons.

[2] In our experience, expectations on these two broad asset classes are relatively similar across industry professionals. Having experimented with different assumptions at the stock and bond levels, we have found that, in general, reasonable but different assumptions still tend to lead to similar overall conclusions.

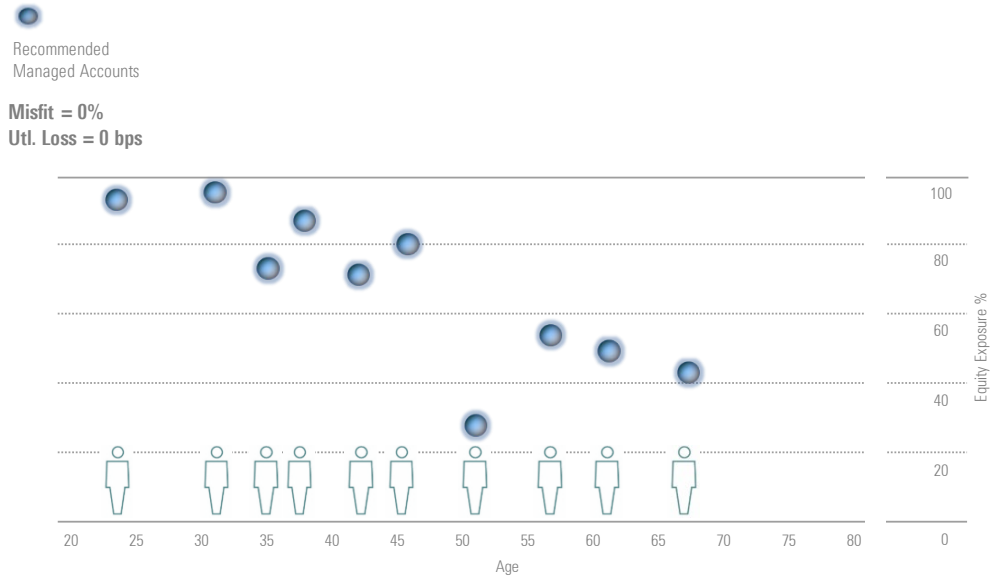
For this type of analysis, our preferred approach is to use returns-based style analysis as put forth in Sharpe (1992), in which we use a relatively large set of explanatory asset class factors or variables. Returns-based style analysis is similar to constrained multiple regression in which the exposures are forced to sum to one or 100% and no negative weights are allowed. The explanatory or independent risk factors are typically mutually exclusive asset classes representing the scope or breadth of investment opportunity sets. Using a high level of granularity across numerous asset classes helps us to capture many of the nuanced differences that exist among the 60-plus open-end target-date fund families and the plethora of non-open-end funds.

As with the original version of the "Stop Guessing" framework, operating under the assumption that the "financial-advisor-in-a-box" arrives at the right or optimum risk level for a given investor, we expand that assumption beyond the correct stock/bond split to now represent the right or optimum detailed asset allocation for each investor. As before, this enables us to algebraically solve for each individual's risk-aversion coefficient. Additionally, using the reverse optimization procedure from another of William Sharpe's articles, Sharpe (1974), we can infer the unique set of asset class returns that would correspond to a given presumed efficient asset allocation. To avoid having one particular set of expected returns drive the results, we simply use the implied asset class betas that dynamically come from the reverse optimization process and then use a basic capital asset pricing model approach to estimate the expected returns of the asset classes (typically with a risk-free rate assumption of 2.5% and a market premium of 5.5%). This is relatively noncontroversial as we know that different practitioners will have different expected return forecasts for many of the asset class but will more often feel comfortable using a historical based covariance matrix.

Thus, for each individual in a plan, we can once again start with the expected utility of the ideal state, in which the utility follows Markowitz's specification: Expected Portfolio Return minus an Individualized Penalty for Risk. Then, as before, we can estimate the utility that a given investor would derive from any potential competing portfolio. Finally, by comparing the difference in utility from the detailed approach with the difference from the utility from the original stock/bond approach, we can attempt to decompose/attribute utility losses into two components: the part that comes from not getting the overall equity level correct and the part that comes from less than ideal detailed asset allocations.

To illustrate this, we pick up the simplified 10-participant example from the first half of the original "Stop Guessing" paper. In Exhibit 4, the managed accounts engine has been used to arrive at an individualized asset-allocation recommendation—at the equity level—for a plan with 10 participants in which the ideal equity level for each participant is represented by a blue bubble. These bubbles have nothing to do with the participant's current asset allocation; rather, these are what the "financial advisor-in-a-box" recommends based on all the known information about each participant. If these participants were enrolled in managed accounts, each of them would receive as close as possible to the ideal asset allocation for them; thus, the asset-allocation "misfit" is near to or at zero, and there is no (or very little) corresponding loss in utility.

Exhibit 4 Ideal Equity Level Asset Allocations for 10-Participant Plan



Source: Author Calculations.

Exhibit 5 displays what we think are the ideal detailed asset allocations for each of the 10 participants based on what is known about them. We reiterate that the specification of the detailed asset allocations is an assumption. We have our preferred methodology for arriving at what we think is the most appropriate detailed asset allocation based on an individual's unique circumstances but recognize that others will certainly have views on this. The framework is agnostic to the source of these detailed asset allocations, and different adopters of the framework can estimate them as they see fit.

Moving from left to right in Exhibit 5, we continue to order the participants based on age. As a general observation, the level of equity is decreasing with age but not all the participants fit the pattern well. For example, Participant 7's recommended asset allocation of 73% in fixed income is quite a bit more conservative than the three older participants and driven by Participant 7's unique circumstances. Next, notice that even though Participant 10's overall allocation to fixed income is quite a bit lower than Participant 7's fixed-income allocation, Participant 10 has a significantly higher allocation to inflation-linked bonds than Participant 7. From a total wealth perspective, Participant 10 needs more inflation protection than Participant 7. This is just one example of the numerous detailed asset-allocation nuances that have been tailored to each participant based on their unique circumstances.

Exhibit 5 Ideal Detailed Asset Allocations for 10-Participant Plan

Participant:	P 1	P 2	P 3	P 4	P 5	P 6	P 7	P 8	P 9	P 10
Age:	23	32	35	37	43	45	51	57	61	67
Equity Target %:	90	93	75	86	72	80	27	55	49	43
Asset Classes										
US Large Growth TR USD	13.6%	14.3%	11.6%	13.7%	11.9%	13.5%	4.2%	9.8%	8.9%	8.0%
US Large Val TR USD	13.8%	14.6%	11.9%	14.0%	12.1%	13.8%	4.2%	10.0%	9.1%	8.2%
US Mid Growth TR USD	5.8%	6.1%	5.0%	5.9%	5.1%	5.8%	1.8%	4.2%	3.8%	3.4%
US Mid Val TR USD	5.9%	6.2%	5.1%	6.0%	5.2%	5.9%	1.8%	4.3%	3.9%	3.5%
US Small Growth TR USD	5.1%	5.2%	4.0%	4.6%	3.6%	4.0%	1.1%	2.4%	2.0%	1.6%
US Small Val TR USD	5.2%	5.3%	4.1%	4.7%	3.7%	4.0%	1.1%	2.4%	2.0%	1.6%
US REIT TR USD	2.8%	2.8%	2.8%	2.7%	2.6%	2.6%	2.5%	2.4%	2.3%	2.2%
DM xUS GR USD	24.4%	25.1%	19.6%	22.6%	18.2%	20.2%	5.7%	12.7%	11.0%	9.3%
EM GR USD	10.5%	10.6%	8.1%	9.2%	7.1%	7.7%	2.1%	4.4%	3.6%	2.8%
US Shrt Core Bd TR USD	0.0%	0.0%	0.3%	0.3%	1.0%	0.8%	4.3%	3.4%	4.4%	5.9%
US Inter Core Bd TR USD	1.9%	1.3%	4.7%	2.7%	5.4%	3.9%	14.2%	8.8%	10.1%	11.4%
US Lng Core Bd TR USD	6.0%	4.0%	13.5%	7.2%	12.5%	8.4%	25.7%	12.6%	11.9%	9.3%
High Yield Corporate TR USD	0.7%	0.5%	1.8%	1.0%	2.2%	1.6%	6.0%	3.9%	4.6%	5.3%
Gbl xUS Gov Bd TR USD	1.4%	1.0%	3.4%	1.9%	3.5%	2.4%	8.3%	4.7%	5.0%	5.1%
EM Sovereign Bd PR USD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Lng-Only Cmdty TR USD	2.8%	2.8%	2.8%	2.7%	2.6%	2.6%	2.5%	2.4%	2.3%	2.2%
US Shrt TIPS TR USD	0.0%	0.1%	0.5%	0.4%	1.5%	1.3%	6.8%	5.2%	6.7%	9.1%
US Lng TIPS TR USD	0.0%	0.0%	0.4%	0.3%	1.3%	1.1%	5.2%	4.3%	5.6%	7.4%
Cash TR USD	0.0%	0.0%	0.2%	0.2%	0.6%	0.5%	2.6%	2.0%	2.6%	3.5%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Equities	90.00%	93.00%	75.00%	86.00%	72.00%	80.00%	27.00%	55.00%	49.00%	43.00%
Fixed Income	10.00%	7.00%	25.00%	14.00%	28.00%	20.00%	73.00%	45.00%	51.00%	57.00%

Using the methodology from Idzorek, Blanchet, and Bruns (2018), we can evaluate any number of potential QDIAs, searching for the one that fits this particular group of participants best.

Let's assume that the plan sponsor in question has narrowed the selection of the QDIA down to three open-end target-date funds, all of which are available on the retirement recordkeeper's platform (we have masked the identity of the fund families in question), plus a custom target-date product proposed by the plan consultant. To go beyond the original framework and attempt to evaluate the appropriateness of the detailed asset allocations that each participant would receive from being defaulted into one of the four options under consideration, we need to analyze the detailed asset allocations of each target-date vintage and restate the exposures using a common model that allows us to compare the detailed asset allocation from the various potential providers on a common footing. Again, there are different ways to do this, most of which involve a subjective mapping exercise or a risk factor model of some sort. In this example, we use returns-based style analysis in which we rescale the factor exposures based on the fund's currently observable stock/bond split. This rescaling helps adjust for any "gliding" effects or outright changes to the glide path over the RBSA measurement period.

The four panels of Exhibit 6 report the estimated asset allocations of the age-based vintages associated with the three fund families; as well as the R-squared values of the corresponding RBSA. The RBSA estimated exposures result in an asset allocation, sometimes referred to as a *custom style benchmark*, that best mimics the behavior of the fund or portfolio in question and does not necessarily represent explicit holdings.

Exhibit 6 Estimated Detailed Asset-Allocation Exposures for Three Potential QDIAs

Asset Classes	2055	2050	2045	2040	2035	2030	2025	2020	2015	2010
Panel A: QDIA Fund Family A										
US Large Growth	19.2%	19.3%	19.6%	18.5%	17.2%	15.7%	13.9%	12.5%	9.0%	8.2%
US Large Val	22.2%	22.3%	21.9%	21.7%	19.2%	17.2%	16.0%	13.3%	10.8%	6.6%
US Mid Growth	3.4%	3.7%	4.1%	3.0%	2.3%	1.8%	1.7%	0.5%	0.9%	0.2%
US Mid Val	0.0%	0.0%	0.0%	0.0%	1.6%	1.9%	1.6%	2.7%	2.6%	0.0%
US Small Growth	5.4%	5.3%	4.8%	6.3%	6.1%	5.7%	5.3%	5.2%	4.7%	0.7%
US Small Val	4.9%	4.7%	5.2%	4.4%	3.5%	2.9%	2.6%	1.7%	0.6%	2.3%
US REIT	0.8%	0.8%	0.6%	0.9%	1.3%	1.2%	0.8%	1.3%	1.7%	0.8%
Developed Equity xUS	22.0%	22.0%	22.1%	22.1%	20.1%	17.9%	15.9%	14.1%	11.5%	6.3%
Emerging Market Equity	7.7%	7.6%	7.3%	7.3%	6.1%	5.7%	4.9%	4.4%	3.5%	2.7%
US Shrt Inv Grade Bd	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11.5%
US Inter Inv Grade Bd	6.9%	6.6%	6.5%	7.7%	13.4%	20.8%	26.3%	32.6%	40.6%	18.8%
US Lng Inv Grade Bd	0.0%	0.0%	0.0%	0.0%	0.0%	1.2%	3.4%	3.4%	1.4%	14.1%
High Yield	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%
Global Bonds xUS	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
EM Sovereign Bd	7.4%	7.6%	7.8%	8.2%	9.2%	8.0%	7.5%	7.0%	6.8%	3.3%
Lng-Only Cmdty	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
US Shrt TIPS	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	12.1%
US Lng TIPS	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.7%	0.0%
Cash	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%	3.7%	12.5%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.7%	96.3%	87.5%
R-square	99.5%	99.4%	99.5%	99.4%	99.4%	99.5%	99.4%	99.4%	99.2%	99.2%
Panel B: QDIA Fund Family B										
US Large Growth	18.3%	17.8%	17.9%	16.8%	15.3%	14.0%	11.1%	9.0%	8.8%	8.8%
US Large Val	21.1%	20.4%	20.4%	20.3%	18.2%	16.2%	13.5%	11.4%	9.1%	9.1%
US Mid Growth	5.3%	6.6%	6.2%	5.4%	4.5%	3.9%	2.9%	1.1%	0.0%	0.0%
US Mid Val	1.4%	0.8%	2.9%	1.8%	2.0%	1.5%	2.0%	0.6%	0.0%	0.0%
US Small Growth	2.5%	2.4%	2.5%	2.7%	3.3%	3.5%	4.7%	5.6%	4.4%	4.4%
US Small Val	3.2%	3.7%	2.2%	2.6%	2.3%	2.3%	1.8%	1.9%	3.9%	3.9%
US REIT	11.5%	10.6%	10.1%	9.5%	8.1%	6.5%	4.8%	3.2%	0.0%	0.0%
Developed Equity xUS	23.8%	24.4%	23.6%	22.4%	20.2%	16.7%	14.4%	11.9%	8.4%	8.4%
Emerging Market Equity	7.7%	6.9%	6.7%	6.6%	5.8%	6.0%	4.8%	4.4%	3.3%	3.3%
US Shrt Inv Grade Bd	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	7.0%
US Inter Inv Grade Bd	0.0%	0.0%	0.1%	5.4%	13.0%	21.3%	30.6%	39.1%	34.6%	34.6%
US Lng Inv Grade Bd	0.0%	0.1%	0.5%	0.0%	1.1%	2.3%	2.9%	3.9%	11.3%	11.3%
High Yield	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%
Global Bonds xUS	0.5%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
EM Sovereign Bd	4.8%	5.8%	6.8%	6.3%	6.2%	5.7%	5.4%	4.7%	2.7%	2.7%
Lng-Only Cmdty	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
US Shrt TIPS	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.4%	2.4%
US Lng TIPS	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	1.2%	3.1%	4.0%	4.0%
Cash	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
R-square	99.6%	99.5%	99.6%	99.6%	99.7%	99.7%	99.7%	99.7%	99.8%	99.8%
Panel C: QDIA Fund Family C										
US Large Growth	21.8%	22.5%	22.1%	21.5%	21.7%	18.9%	15.5%	14.3%	12.9%	10.4%
US Large Val	12.0%	12.9%	13.1%	12.9%	12.1%	9.6%	8.2%	5.2%	4.6%	2.5%
US Mid Growth	0.7%	0.4%	0.9%	1.9%	0.0%	0.3%	0.3%	0.0%	0.0%	0.0%
US Mid Val	8.5%	7.0%	8.2%	8.2%	8.6%	8.6%	7.0%	8.2%	6.2%	5.4%
US Small Growth	12.1%	11.7%	11.8%	11.5%	12.4%	12.0%	10.3%	9.2%	7.8%	6.6%
US Small Val	1.0%	1.4%	0.5%	0.7%	1.2%	0.3%	0.3%	0.3%	1.4%	1.3%
US REIT	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.8%
Developed Equity xUS	26.0%	26.4%	25.6%	26.3%	26.1%	24.8%	20.1%	17.3%	15.8%	13.5%
Emerging Market Equity	6.9%	6.5%	7.4%	6.7%	7.0%	5.9%	5.6%	6.2%	5.5%	5.6%
US Shrt Inv Grade Bd	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
US Inter Inv Grade Bd	0.0%	0.4%	0.0%	0.8%	0.0%	10.8%	21.1%	27.8%	30.7%	33.9%
US Lng Inv Grade Bd	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
High Yield	0.0%	1.1%	0.0%	0.1%	0.4%	1.6%	3.1%	3.5%	4.6%	6.1%
Global Bonds xUS	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
EM Sovereign Bd	5.6%	5.5%	4.8%	4.6%	4.8%	5.8%	6.0%	5.4%	6.0%	5.1%
Lng-Only Cmdty	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
US Shrt TIPS	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
US Lng TIPS	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Cash	5.4%	4.2%	5.6%	4.8%	5.7%	1.4%	2.5%	2.6%	4.5%	8.7%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
R-square	99.1%	99.1%	99.1%	99.0%	99.1%	99.0%	99.0%	99.1%	99.1%	99.0%
Panel D: QDIA Fund Family D (Custom)										
US Large Growth	19.0%	19.0%	19.0%	17.4%	15.8%	13.5%	11.3%	10.5%	9.8%	9.5%
US Large Val	19.0%	19.0%	19.0%	17.4%	15.8%	13.5%	11.3%	10.5%	9.8%	9.5%
US Mid Growth	4.8%	4.6%	4.5%	4.1%	3.8%	3.1%	2.5%	2.2%	1.9%	1.8%
US Mid Val	4.8%	4.6%	4.5%	4.1%	3.8%	3.1%	2.5%	2.2%	1.9%	1.8%
US Small Growth	3.0%	2.9%	2.8%	2.5%	2.3%	2.1%	2.0%	2.0%	2.0%	2.0%
US Small Val	3.0%	2.9%	2.8%	2.5%	2.3%	2.1%	2.0%	2.0%	2.0%	2.0%
US REIT	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Developed Equity xUS	26.0%	25.3%	24.5%	21.8%	19.0%	16.3%	13.5%	13.0%	12.5%	12.0%
Emerging Market Equity	9.0%	8.8%	8.5%	7.5%	6.5%	5.5%	4.5%	4.1%	3.8%	3.5%
US Shrt Inv Grade Bd	2.1%	2.3%	2.4%	4.4%	6.3%	8.9%	11.4%	12.5%	13.5%	14.4%
US Inter Inv Grade Bd	3.5%	3.8%	4.0%	7.3%	10.5%	14.8%	19.0%	20.8%	22.5%	24.0%
US Lng Inv Grade Bd	1.4%	1.5%	1.6%	2.9%	4.2%	5.9%	7.6%	8.3%	9.0%	9.6%
High Yield	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Global Bonds xUS	3.0%	3.5%	4.0%	5.3%	6.5%	7.5%	8.5%	8.3%	8.0%	7.0%
EM Sovereign Bd	1.5%	2.0%	2.5%	3.0%	3.5%	3.8%	4.0%	3.8%	3.5%	3.0%
Lng-Only Cmdty	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
US Shrt TIPS	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
US Lng TIPS	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Cash	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Author Calculations.

In Exhibit 7, the top panel identifies the detailed asset allocations Participant 5 would receive from retirement Managed Accounts, QDIA Option A - 2040, QDIA Option B - 2040, QDIA Option C - 2040, and QDIA Option D (Custom Target-Date Product) - 2040. The bottom panel contains information on the utility that Participant 5 would receive from the competing investment options. Notice that the ideal detailed asset allocation (Managed Accounts column) for Participant 5 is more conservative than the asset allocation for the four potential QDIAs, although of the four options under consideration, QDIA Option D (Custom) is the closest to the ideal asset allocation and results in the lowest loss of utility.

Exhibit 7 Comparing Detailed Asset Allocations for Participant 5

Panel A: Detailed Asset Allocations

Asset Classes	Managed Accounts	QDIA Option A	QDIA Option B	QDIA Option C	QDIA Option D (Custom)
US Large Growth TR USD	11.9%	18.5%	16.8%	21.5%	17.4%
US Large Val TR USD	12.1%	21.7%	20.3%	12.9%	17.4%
US Mid Growth TR USD	5.1%	3.0%	5.4%	1.9%	4.1%
US Mid Val TR USD	5.2%	0.0%	1.8%	8.2%	4.1%
US Small Growth TR USD	3.6%	6.3%	2.7%	11.5%	2.5%
US Small Val TR USD	3.7%	4.4%	2.6%	0.7%	2.5%
US REIT TR USD	2.6%	0.9%	9.5%	0.0%	0.0%
DM xUS GR USD	18.2%	22.1%	22.4%	26.3%	21.8%
EM GR USD	7.1%	7.3%	6.6%	6.7%	7.5%
US Shrt Core Bd TR USD	1.0%	0.0%	0.0%	0.0%	4.4%
US Inter Core Bd TR USD	5.4%	7.7%	5.4%	0.8%	7.3%
US Lng Core Bd TR USD	12.5%	0.0%	0.0%	0.0%	2.9%
High Yield Corporate TR USD	2.2%	0.0%	0.0%	0.1%	0.0%
Gbl xUS Gov Bd TR USD	3.5%	0.0%	0.0%	0.0%	5.3%
EM Sovereign Bd PR USD	0.0%	8.2%	6.3%	4.6%	3.0%
Lng-Only Cmdty TR USD	2.6%	0.0%	0.0%	0.0%	0.0%
US Shrt TIPS TR USD	1.5%	0.0%	0.0%	0.0%	0.0%
US Lng TIPS TR USD	1.3%	0.0%	0.0%	0.0%	0.0%
Cash TR USD	0.6%	0.0%	0.0%	4.8%	0.0%
	100.0%	100.0%	100.0%	100.0%	100.0%
Equities	72.00%	84.16%	88.31%	89.66%	77.25%
Fixed Income	28.00%	15.84%	11.69%	10.34%	22.75%
Expected Return	8.00%	8.90%	9.06%	9.31%	8.35%
Expected Variance	0.0142	0.0199	0.0209	0.0230	0.0163
Standard Deviation	11.90%	14.12%	14.45%	15.17%	12.78%

Panel B: Utility Comparisons

Total Utility	5.25%	5.03%	5.00%	4.84%	5.18%
Total Decrease in Utility vs. Ideal	--	0.22%	0.25%	0.41%	0.07%
Utility Loss Due to Equity Level Misfit	--	0.15%	0.21%	0.32%	0.03%
Utility Loss Due to Detailed Asset Allocation	--	0.07%	0.04%	0.09%	0.04%

Source: Author Calculations.

Focusing on the bottom panel of Exhibit 7, the first row identifies the total utility of each of the possible detailed asset allocations for Participant 5. In all cases, the total utility of the competing investment options will be lower than the ideal participant-specific asset allocation. The second row displays the estimated utility loss relative to the ideal asset allocation. The final two rows decompose the total utility loss into two components: 1) the loss in utility due to an equity level that does match the appropriate level for the participant, and 2) after accounting for the equity level utility loss, this is the additional utility loss due to a less than ideal detailed asset allocation. For the most part, the utility loss for Participant 5 is attributable to the wrong equity level, which dominates the total utility loss (3 to 32 basis points), while the utility losses attributable to a less than ideal detailed asset allocation are lower (4 to 9 basis points). This example has focused only on Participant 5, but the same exercise needs to be carried out for every plan participant, and then participant-level figures can be aggregated and averaged to help inform plan decision-making.

Exhibit 8 follows the same format as the bottom panel of Exhibit 5, but rather than display values for an individual participant, it displays the averages for the 10 participants in this hypothetical plan.

Exhibit 8 Average Utility Comparison for 10-Participant Plan

	Managed Accounts	QDIA Option A	QDIA Option B	QDIA Option C	QDIA Option D (Custom)
Total Utility	5.25%	4.79%	4.83%	4.47%	5.0143%
Total Decrease in Utility vs. Ideal	--	0.46%	0.42%	0.78%	0.24%
Utility Loss Due to Equity Level Misfit	--	0.42%	0.40%	0.72%	0.21%
Utility Loss Due to Detailed Asset Allocation	--	0.04%	0.03%	0.06%	0.02%

Source: Author Calculations.

In Exhibit 8, total utility is desirable, and any loss in utility is undesirable. In the absence of cost, the investment option with the highest utility provided the most potential benefit; thus, in this example, one would select Managed Accounts, followed by Option D, Option B, Option A, and finally Option C. Let's temporarily assume that Managed Accounts, Option D, and Option C aren't viable for this plan and focus on Option A and Option B—they produce overall utility that differs by only 4 basis points. As long as Option B doesn't cost more than 4 basis points more than Option A, the plan decision-maker should choose Option B. If the expense of Option B is more than 4 basis points higher than Option A, from this lens, the plan decision-maker should choose Option A. The beauty of this framework is the ability to simultaneously consider cost and potential benefits using a common language.

Exhibit 9 builds upon Exhibit 3 by adding an additional couple of rows to highlight the loss in utility coming from detailed asset allocations after having already accounted for the utility loss associated with the overall stock versus bond split. At this point, QDIA Option D is the most compelling, followed by Managed Accounts and QDIA Option B.

Exhibit 9 All-In Cost Comparison Including Alpha Expectations and Loss in Utility From Detailed Asset Allocation

	Managed Accounts	QDIA Option A	QDIA Option B	QDIA Option C	QDIA Option D (Custom)
Investment Fees	75	35	25	8	37
Risk Level Utility Loss	0	42	40	72	35
All-in Cost / Utility Loss	75	77	65	80	72
Expected Alpha	7	10	0	0	7
All-in Cost / Utility Loss (w/ Alpha)	68	67	65	80	65
Detailed Asset Allocation Utility Loss	0	4	3	6	2
All-in Cost (w/ Alpha & AA Utility Loss)	68	71	68	86	67

Source: Author Calculations.
Notes: Investment Fees for Managed Accounts assumes 30 basis points for weighted average fund fees and 45 basis points for Managed Accounts service fee. QDIA Option D (Custom) assumes 30 basis points for weighted average fund fees and 7 basis points for custom glide-path fee.

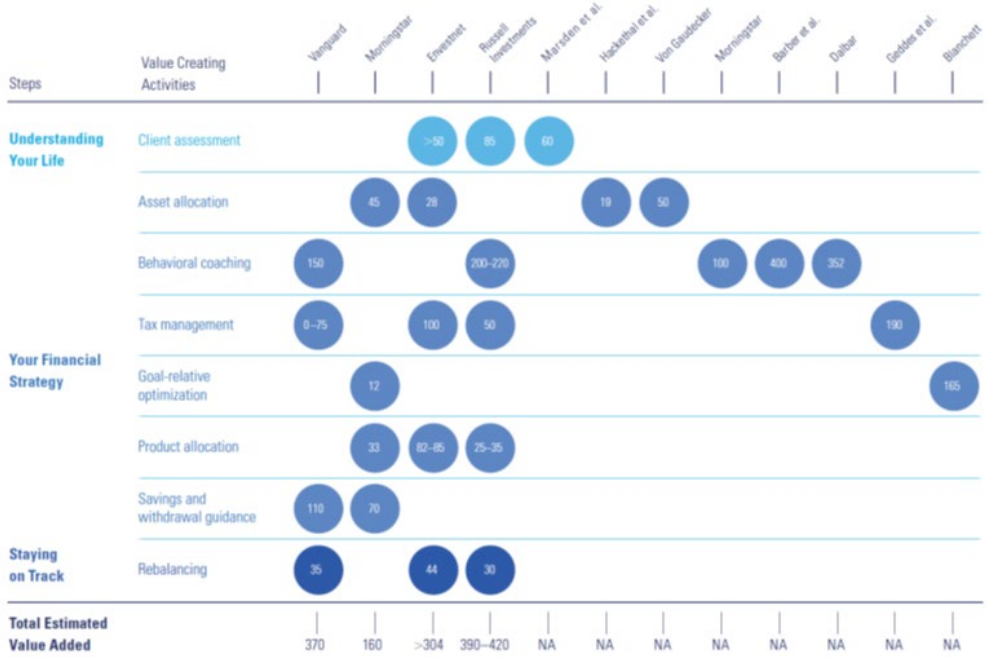
Again, while we have demonstrated the framework using a 10-participant plan, the framework is just as applicable to plans with more than 1 million participants and anywhere in between.

Potential Benefit of Financial Planning "Gamma" or "Alpha"

One of the most glaring shortcomings of the original "Stop Guessing" framework was its inability to capture the majority of the ways in which retirement managed accounts can be designed to help benefit a participant. The appeal of managed accounts was reduced to simply getting the equity level recommendation for a given participant correct.

A number of relatively recent papers have attempted to tackle the topic of the potential value of financial planning and financial-planning decisions. These papers include Blanchett and Kaplan (2013, 2017), Kinniry et al. (2014), and Envestnet (2015). The literature on quantifying the value of financial planning typically attaches a value ranging from about 20 basis points to about 50 basis points for "asset-allocation-only" advice, while the value of comprehensive financial planning has been estimated at around 300 basis points per year. A study by Merrill Lynch summarizes the results from a variety of research papers that explored the value of various financial-planning activities. An exhibit from its original research is included here as Exhibit 10.

Exhibit 10 Estimated Value of Different Financial-Planning Activities (Annual Basis Points)



Source: Merrill Lynch, "The Value of Personal Financial Advice."

Leveraging these various studies and their various estimates, a Morningstar, Inc. product/service called the Best Interest Scorecard attempts to quantify the value that the various services of a financial advisor could add versus an uninformed or naïve approach. On some level, retirement managed accounts is an attempt to replicate a subset of the possible services/activities conducted by a financial advisor. For this reason, we sometime describe the "advice engine" as a "financial-advisor-in-a-box." Outside of the core asset-allocation recommendation, fund evaluation, and portfolio-construction activities (most of which we have already discussed), Exhibit 11 is a list of financial advisor activities and the assumed value added by each service. These are the values used in Morningstar's Best Interest Scorecard system, and the values are considerably more conservative than the values summarized in Exhibit 10.

Unfortunately, within a typical managed accounts use case, not all the services that a true financial advisor could perform are available or effective. Some of these services can be performed by the managed accounts service, yet limitations will likely decrease the amount of expected benefits relative to that which could be offered by a real-world financial advisor. Here, we have used different shades of gray to indicate which financial advisor services will not be fully realized, in which the darkest shade indicates no expected benefit associated with managed accounts and lighter gray indicates that managed accounts could provide some benefit but likely somewhat lower than that provided by an actual advisor. Unshaded rows indicate that managed accounts should be able to provide the full benefit to the participant and should provide that participant with the full benefit of the service.

Exhibit 11 Estimated Annual Value of Financial-Planning Activities by Lifecyle Stage

Service	Early Accumulation	Mid Accumulation	Transition	Early Retiree	Late Reti
Savings Guidance	0.75%	0.50%	0.25%	0.00%	0.00
Insurance Planning	0.30%	0.25%	0.20%	0.15%	0.10
Estate Planning	0.15%	0.15%	0.15%	0.15%	0.15
Tax-Efficient Investing	0.20%	0.30%	0.40%	0.40%	0.25
Retirement Withdrawal Planning	0.00%	0.20%	0.40%	0.60%	0.30
Pension Optimization	0.00%	0.15%	0.30%	0.30%	0.20
Annuity Planning	0.00%	0.25%	0.50%	0.40%	0.30
Retirement Age Guidance	0.20%	0.30%	0.40%	0.30%	0.00
Total Wealth Asset Allocation	0.25%	0.25%	0.25%	0.25%	0.25
Behavioral Coaching	0.50%	0.50%	0.50%	0.50%	0.50
Rebalancing	0.10%	0.10%	0.10%	0.10%	0.10

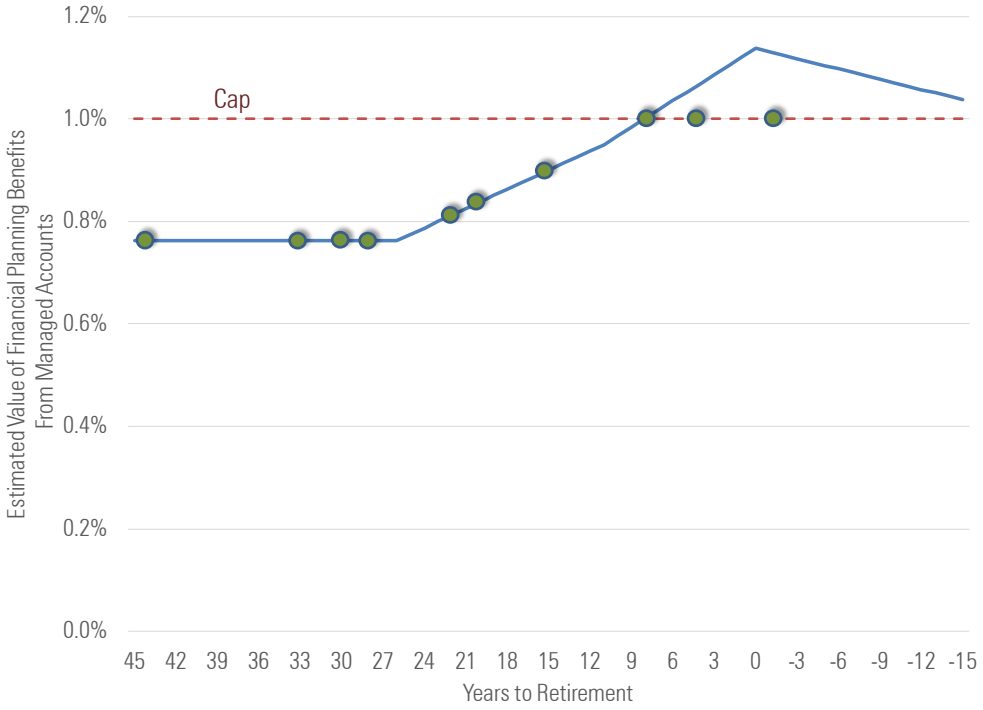
Given that a common fee charged by real world financial advisors is 100 basis points, in this example, when calculating the potential utility increase from financial advice, we impose a cap of 100 basis points. The application of a cap is ultimately up to the plan sponsor or plan consultant. Of course, many participants have relatively low balances and are likely underserved by financial advisors, so managed accounts may be a good way for them to receive financial-planning advice.

Using a fully operationalized version of this schedule for each participant in a plan, based on their age and expected years to retirement, we can estimate the value of financial-planning services a participant would receive from managed accounts. While Exhibit 11 is indicative of the approximate values that we think are justified and supported by the literature, the framework is flexible enough to receive assumptions from a plan sponsor or retirement plan consultant.

To move forward with our example, using the values in Exhibit 11 coupled with a years-to-retirement framework, we assume that within a retirement managed account setting there will be a reduction in value. For the dark-gray rows, we assume 0% of the estimated value will be realized; for the light-gray rows, 25% of the estimated value will be realized; and for the unshaded rows, 50% of the estimated value will be realized. This leads to the schedule depicted in Exhibit 12.

The value of financial-planning activities within a managed accounts setting should typically increase and peak as the participant moves toward retirement. From earlier, Exhibit 10 supports the notion that the value added from a financial advisor far exceeds the standard 100 basis points that is typically charged. Similarly and excluding the potential benefit from the equity level allocation, detailed asset allocation, and fund alpha from picking better funds, Exhibit 12 suggests that the value added from the financial-planning activities from managed accounts exceeds the typical managed account fee.

Exhibit 12 Operationalized Estimates of Annual Value of Financial-Planning Activities (Years to Retirement)



Source: Author calculations.

In Exhibit 12, we have used green dots to plot the estimated value that each of the 10 participants in our hypothetical plan should derive from Managed Accounts. The average utility benefit for these 10 participants is 86 basis points. A powerful implication based on these conservative numbers is that, in all cases, Managed Accounts is likely to be the best overall option for any participant, based solely on the value provided from its embedded financial advice (excluding equity level recommendation, detailed asset allocation, and alpha from manager selection). To demonstrate this, Exhibit 13 builds upon Exhibit 9 and Exhibit 3 by adding an additional set of rows at the bottom to highlight the impact on utility.

In Exhibit 13, the utility gain from financial planning for the 10 plan participants is estimated at 86 basis points, which we show in green to indicate that it is positive. The red numbers indicate a loss in utility. In general, fiduciaries should select the QDIA with the highest positive utility or, for many options, the lowest all-in cost/utility loss. So, if one accepts the value of financial planning in Exhibit 13, Managed Accounts is the best choice, followed by Option D, and then Option B. Ironically, Option C, which is the lowest investment fee option, is actually the worst option given that its all-in cost/utility loss is the highest. This highlights the danger of simply picking the lowest-cost option without considering the other attributes of the options.

Exhibit 13 All-In Cost Comparison Including Alpha Expectations, Loss in Utility From Detailed Asset Allocation, and Utility Gain From Financial Planning

	Managed Accounts	QDIA Option A	QDIA Option B	QDIA Option C	QDIA Option D (Custom)
Investment Fees	75	35	25	8	37
Risk Level Utility Loss	0	42	40	72	35
All-in Cost / Utility Loss	75	77	65	80	72
Expected Alpha	7	10	0	0	7
All-in Cost / Utility Loss (w/ Alpha)	68	67	65	80	65
Detailed Asset Allocation Utility Loss	0	4	3	6	2
All-in Cost (w/ Alpha & AA Utility Loss)	68	71	68	86	67
Utility Gain from Financial Planning	86	0	0	0	0
Relative Gain (Green Positive / Red Negative)	18	71	68	86	67

Source: Author Calculations.
Notes: Investment Fees for Managed Accounts assumes 30 basis points for weighted average fund fees and 45 basis points for Managed Accounts service fee. QDIA Option D (Custom) assumes 30 basis points for weighted average fund fees and 7 basis points for custom glide path fee.

Again, while we have demonstrated the framework using a 10-participant plan, the framework is just as applicable to plans with 1 million participants and anywhere in between.

Potential Benefit From Selling Company Stock

In the previous section on the value of financial advice in a managed accounts setting, we purposely did not address the potential value of diversifying away from company stock for four reasons: 1) most of the literature on the value of financial advice does not quantify this aspect of advice; 2) plan sponsors often have and exercise discretion to limit retirement managed accounts from selling company stock, making this a plan-by-plan assessment; 3) the degree to which holding company stock is a negative depends on the participant's unique circumstances; and 4) our utility-based framework is well-suited to calculate the potential benefit at the individual participant level; thus, the generalization used in the previous section is not needed.

From a good financial-planning perspective, it is widely recognized that employees should diversify their total wealth, not only within their financial capital but also among financial capital and human capital. Because an individual's human capital is highly dependent upon a specific company, from a holistic financial-planning perspective, it does not make sense to create greater risk exposure to the same specific company. Holding company stock exposes participants to unnecessary risk that can easily be diversified away. The classic example is Enron, in which the fate of Enron turned relatively quickly, wiping out previous large amounts of financial capital (company stock) at the same moment many participants lost their jobs, experiencing a dramatic interruption to human capital.

While holding company stock is often less than ideal, there can be tax reasons to temporarily delay the sale, and depending upon a participant's individual circumstances, the degree of potential harm or unnecessary loss in utility from holding company stock can vary widely.

There are three questions one might be interested in answering.

1. How detrimental is it to hold company stock?
2. To what degree can the detriment (utility loss) of holding company stock be reduced by adjusting one's asset allocation to account for company stock?
3. Continuing from number two, how different should the asset allocation be in the presence of company stock?

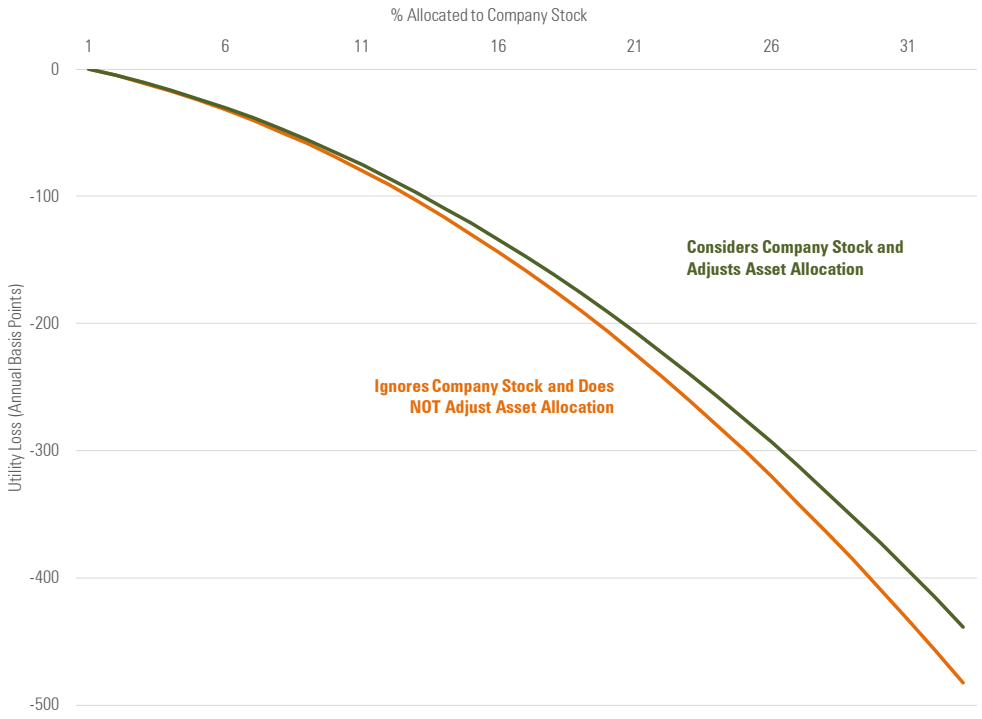
We delay answering number three, which we will address in our final section.

To apply our utility-based framework to the company stock problem, one must expand the estimated capital market assumptions to now include an expected return, standard deviation, and correlation estimates with the other asset classes for the company stock in question. As a general heuristic, we find that the standard deviation of an individual stock is often about twice that of the asset class. For example, if the standard deviation of U.S. large cap is estimated at 18%, a reasonable estimate for an individual stock might be 36%. From an expected return perspective, we tend to set the expected return of the company stock equal to that of the asset class in question. For example, if the company stock is a U.S. large-value company and the expected return for the asset class is 9%, we would typically use that as the estimated expected return. While this is Morningstar Investment Management's perspective, practitioners should adjust their assumptions as they see fit.

In Exhibit 14, we start by illustrating the loss in utility of holding company stock. More specifically, we start with an ideal 60% equity/40% bond mix and then assume that the 60/40 mix is held in conjunction with an increasing allocation to company stock (green line in Exhibit 14). While the utility loss of a small allocation to company stock is low, as the allocations grow, they quickly result in a substantial loss in annual utility. For example, if the ideal asset allocation is 60/40 and a participant holds a 60/40 portfolio plus company stock representing 20% of their total financial wealth, the loss in utility is well over 200 annual basis points!

We can also analyze the impact of accounting for the value of company stock held by a participant and then adjusting the asset allocation of the noncompany stock assets to maintain or achieve the desired overall financial capital stock/bond split in the presence of company stock (orange line in Exhibit 14). While the utility loss is marginally lower, this highlights that it simply doesn't make sense to hold company stock. We know this is a message that many plan sponsors won't like, but we also believe that most are aware that employees should not hold significant amounts of company stock.

Exhibit 14 Utility Loss From Diverging From a 60/40 Ideal Asset Allocation Into Company Stock



Source: Author Calculations.

Participants Don't Always Provide Complete Information

Back in Exhibit 1, in our 10-participant example, we demonstrated that, based on the known information for each participant, they were mapped to their ideal asset allocations, and as such, there was no equity allocation misfit and no utility loss. While this may be the ideal asset allocation based on what we know about a participant, in many cases our information will be incomplete. For calculating this aspect of the value added by managed accounts, is it fair to assume zero misfit and no loss in utility? We think the answer is "no."

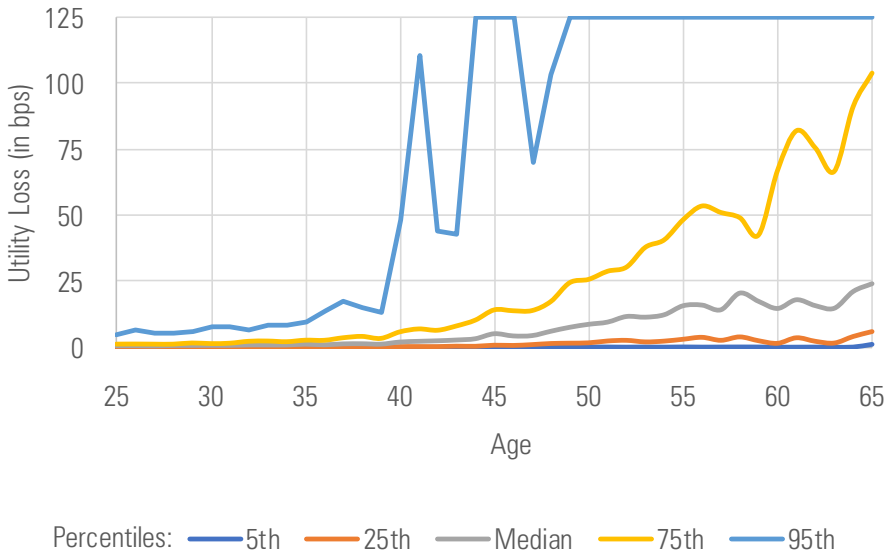
Stepping back a bit, this situation is directly analogous to when individuals meet with real-world financial advisors and do not divulge all of their financial assets—the financial advisors will do their best with the known information. In our context of thinking about the best QDIA for a group of participants, we have an advantage over the financial advisor working with a specific individual.

While not perfect, we have a wide variety of current managed account users, some of whom were defaulted into managed accounts and provided relatively limited data. Other managed accounts participants have had consultations with call center representatives who work at the plan recordkeeper. We do not know if the additional information provided during the consultations is complete, but it does

enable us to compare the equity allocations the participant would get if he or she were defaulted into managed accounts using the current base participant information (age, gender, savings rate, balance, income, and so on) that comes directly from the recordkeeper versus the current equity allocation (after the consultation).

For this analysis, we have data on 15,425 allocations. For each participant, we have an actual equity allocation as of Dec. 31, 2019, and use the respective default participant data to estimate what the equity allocation would be if we defaulted the participant into managed accounts. We then use the utility model to estimate the utility loss associated with the default investment allocation for each of the 15,425 participants. We increase the maximum potential utility loss to 125 basis points to illustrate that the assumption around caps is up to the plan sponsor or consultant. This distribution of the utility loss values at each age cohort is included in Exhibit 15.

Exhibit 15 Utility Loss Distribution by Age for 15,425 Managed Account Participants
Limited Default-Based Data Points vs. Assumed Complete Data Points



Source: Author Calculations.

The average utility loss across all participants is 13 basis points, and the median is 4. The differences increase for older participants. This is not a surprise because the distribution of equity allocations also tends to increase for older participants.

Overall, the "loss" associated with having incomplete participant information is relatively low, which suggests the managed account does a good job accounting for incomplete information (and is designed as such).

Conclusions

This paper extends the original "Stop Guessing" framework for using participant data to help plan sponsors and retirement plan consultants make more-informed, repeatable, and data-driven decisions around QDIA selection.

First, for those with specific afterfee alpha expectations for different funds and different solutions, we demonstrated how to include those into our utility-based framework. Next, we extended the framework to calculate the utility loss of a given detailed asset allocation relative to an assumed efficient detailed asset allocation. We then broadened the framework to capture the potential benefits associated with financial-planning "gamma" or "advisor's alpha" that one might receive from managed accounts. We then applied our utility-based framework to quantify the utility loss associated with holding company stock and, thus, the expected benefit of diversifying out of company stock. Finally, for 15,425 managed account participants, we calculated the utility differential from an equity level recommendation based on limited data points versus an expanded set of data points following an interactive advice session with a recordkeeper call-center representative.

By incorporating these various extensions into a utility-based framework, plan sponsors can and should move beyond basing QDIA decisions simply on investment fees. This extended framework enables a plan sponsor to compare the potential benefits and costs of competing products or services and choose the QDIA that is positioned to provide the highest aftercost benefit potential to their participants.

References

Blanchett, D.M., & Kaplan, P. 2013. "Alpha, Beta, and Now… Gamma." *The Journal of Retirement*, Vol. 1, No. 2, P. 29.

Blanchett, D.M., & Kaplan, P. 2018a. "The Value of a Gamma-Efficient Portfolio." *Journal of Retirement*, Winter 2018, P. 32.

Blanchett, D.M., & Kaplan, P. 2018b. "Beyond the Glide Path: The Drivers of Risks in Target-Date Funds." *Journal of Retirement,* Spring 2018, P. 25.

Blanchett, D.M., & Straehl, P.U. 2015. "No Portfolio Is an Island." *Financial Analysts Journal,* Vol. 71, No. 3, P. 15.

Blanchett, DM., & Idzorek, T.M. 2015. "The Retirement Plan Effectiveness Score | A Target Balance-Based Measurement and Monitoring System." Morningstar Investment Management Working Research Paper.

Envestnet. 2015. "Capital Sigma: The Return on Advice." Envestnet White Paper.

Idzorek, T., Stempien, J., & Voris, N. 2011. "Selecting a Target Date Benchmark". Morningstar Investment Management Research Paper. http://corporate.morningstar.com/ib/documents/TargetMaturity/SelectTargetDateBenchmark.pdf

Sharpe, W.F. 1974. "Imputing Expected Security Returns from Portfolio Composition." *Journal of Financial and Quantitative Analysis,* June, P. 463.

Kinniry, F.M., Jaconetti, C.M., DiJoseph, M.A., et al. 2014. "Putting a value on your value: Quantifying Vanguard Advisor's Alpha." Vanguard White Paper. https://www.vanguard.com/pdf/ISGQVAA.pdf

Ptak, J., Traulsen, C. & Li, J. 2017. "The Morningstar Analyst Rating for Funds: Analyzing the Performance of the Analyst Rating Globally." Morningstar White Paper.

Appendixes

Appendix 1: Decomposing Total Utility Loss

When decomposing total utility loss into the part attributable to a) a high-level equity misallocation, and b) that which is caused by a suboptimal detailed asset allocation (after account for the equity level), there is no definitive best practices. We are exploring new ground.

Arguably, by comparing the total utility loss of the ideal detailed asset allocation to that of the less than ideal detailed asset allocation, we arrive at a reasonable estimate of *total* utility loss. Decomposing that total utility loss into two major components involves some choices and is a bit problematic.

We can approach the problem from either direction (and we choose both).

Estimating Utility Loss From High-Level Stock Mismatch: We can restate the detailed asset allocations (from managed accounts and the QDIA in question) in terms of a simple stock versus bond mix. Comparing the utilities from these simplistic stock/bond mixes gives us an estimate of the utility loss that a participant would experience due to having an asset allocation with the wrong overall risk level. Under this approach, the utility loss associated with a less than ideal detailed asset allocation could be estimated as the leftover part.

Estimating Utility Loss From Detailed Asset Allocation (After Accounting for Equity-Level Mismatch: Approaching the problem from the opposite direction, based on the overall equity level of the QDIA in question, based on the investor's age, we can determine what the equivalent detailed asset allocation from managed accounts would be. We can then compare the total utility from an equity-level adjusted detailed managed account asset allocation to the detailed asset allocation of the QDIA in question. This provides us with an estimate of the utility loss due to a less than ideal detailed asset allocation (having eliminated or controlled for an overall equity level mismatch). Under this approach, the utility loss associated with a less than ideal overall equity level is the leftover part or residual.

Adding these two estimates together represents an alternative method for estimating total utility loss that is often slightly different from the originally estimated total utility loss. As such, we use the ratio of these two individually estimated components of utility loss as the basis for decompose the original overall estimate.

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