



Mixed Benefits: Identifying a Single Glide Path for All

Closed and frozen defined benefit plans shape glide path design.



May 2021

KEY INSIGHTS

- Plan sponsors increasingly maintain mixed benefit structures because of changing defined benefit (DB) plan offerings and merger and acquisition activity.
- Differences in DB plan coverage should be considered when selecting a glide path for all participants in a defined contribution plan's target date offering.
- We believe it is possible to identify a glide path appropriate for all participants by closely considering those without DB plan access within the workforce.

Many employers have made changes to their defined benefit plans in recent years. While some sponsors have closed plans to new hires and/or frozen benefit accruals for current employees, others have brought together plans with differing status and/or levels of employee coverage as a result of merger and acquisition activity. These actions can result in a workforce that has varying degrees of access to different sources of retirement income, typically based on tenure with the company.

When a sponsor decides to close a DB plan to new participants, most of the workforce continues to accrue DB benefits in the first few years after closure. However, the plan's characteristics will slowly shift as more participants terminate or retire and are replaced by employees not eligible for plan coverage. These new hires typically

are only enrolled in the sponsor's defined contribution (DC) plan.

Sponsors may face a potentially difficult administrative challenge when both employee cohorts—DB plan participants and nonparticipants—are covered by the same DC plan, typically with a single target date offering as the qualified default investment alternative (QDIA).

Sponsors often ask us how DB plan benefit structures should be reflected in their glide path evaluation process. The previous installment in our *Making the Benefit Connection* series¹ argued that, under a set of preferences we believe applicable to a broad participant population, it may be appropriate to reduce equity exposure in the glide path when DB plan coverage is available because participants may not need to absorb additional market volatility when their defined benefits provide a base



Justin Harvey, ASA, CFA
*Head of Analysis,
Multi-Asset Solutions*



Adam Langer, CFA
Quantitative Investment Analyst



Lorie Latham, CFA
*Senior Defined
Contribution Strategist*

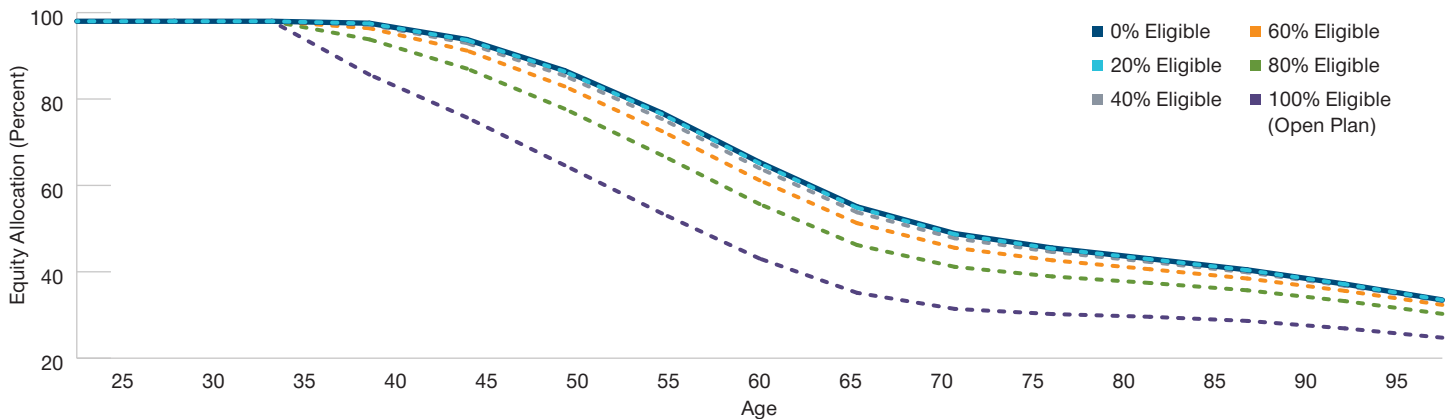


Joe Martel, CAIA, CFA
Portfolio Specialist

¹ Adam Langer, Joe Martel, Aaron Stonacek, and James Tzitzouris. How Do You Evaluate a Glide Path? Glide Path Evaluation Is Not an Easy Task, T. Rowe Price Insights on Retirement (2021).

The Optimal Equity Allocation Declines as Defined Benefit Eligibility Increases

(Fig. 1) Hypothetical glide paths based on percent of participants eligible for a DB plan



For illustrative purposes only. Not representative of an actual investment or T. Rowe Price product. This analysis contains information derived from a Monte Carlo simulation. See Appendix for important information.
Source: T. Rowe Price.

level of retirement income.² However, we believe the answer is more nuanced for most plan sponsors—particularly if their DB plan is either closed to new entrants or frozen for all participants.

In fact, our analysis shows that if any participants in the DC plan do not have access to the DB plan (i.e., if the DB plan was closed before a portion of the current workforce joined the company), then the glide path that potentially provides the highest overall utility for the entire DC plan population in our simulations often has a similar level of equity exposure as one suitable for a sponsor who offers no DB plan at all.

Optimal Glide Paths Based on DB Plan Eligibility

T. Rowe Price's glide path assessment framework focuses on outcomes. Our primary objective is to seek to maximize investor utility derived from consumption and wealth, rather than focusing on conventional investment metrics—such as risk-adjusted rates of return—that are more typically used in the target date industry. Using our

framework, we can investigate how the existence of a closed or frozen DB plan potentially can impact the optimal shape of a target date glide path.

Figure 1 shows a range of glide paths for a hypothetical QDIA offering when differing percentages of the DC plan population also are eligible for defined benefits.³

If 100% of the employees in our hypothetical example were DB plan eligible (i.e., if the plan was still open), then the lowest equity glide path shown in Figure 1 (the bottom line) potentially would produce the best aggregate retirement outcomes across the entire sample population, given our utility preference settings.

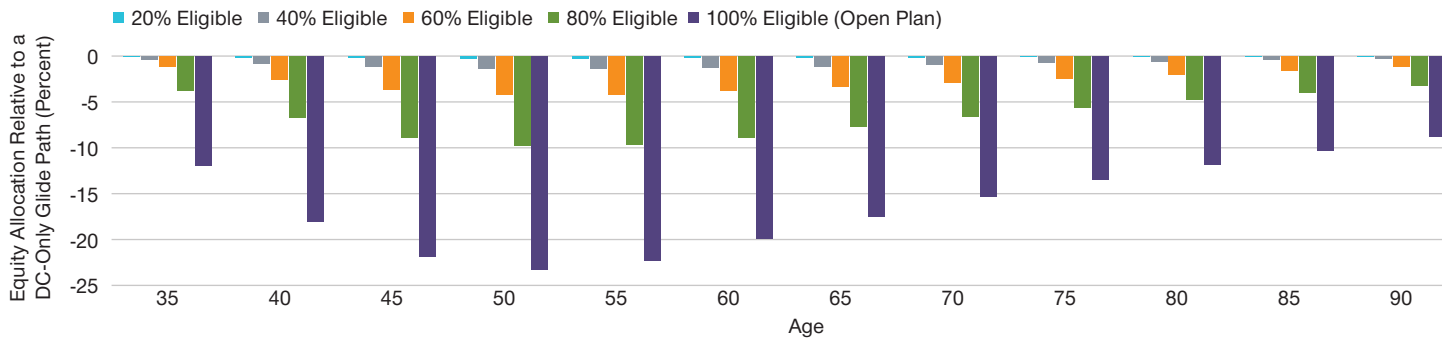
Alternatively, if 0% of all employees were DB eligible (i.e., if the employer had no DB plan at all), then the glide path with the highest equity allocation (the top line in Figure 1) potentially would be the utility-maximizing solution. Between these two extremes are glide paths optimized for sponsors that have closed DB plans with varying proportions of eligible participants.

² This is the set of assumed preferences we used to design the glide path for T. Rowe Price's suite of Retirement Solutions. The broad population we used in this modeling is reflective of our recordkeeping universe.

³ For details on the modeling assumptions used in our analysis, please see the Appendix.

Changes in Optimal Equity Exposure Are Minimal When Defined Benefit Eligibility Is Reduced

(Fig. 2) Differences in hypothetical equity allocations at various ages based on DB plan eligibility



For illustrative purposes only. Not representative of an actual investment or T. Rowe Price product. This analysis contains information derived from a Monte Carlo simulation. See Appendix for important information.
Source: T. Rowe Price.

“Our analysis of closed plans shows that unless there is a DB plan open to all participants, sponsors should consider solving for the “lowest common denominator,” which is to assume that there is no DB plan at all.

Note that the different glide paths are not evenly spaced, indicating that the proportion of employees who are eligible for the DB plan can have a nonlinear effect on glide path suitability. Figure 2 shows this more explicitly:

- The allocation shifts were negligible until 80%+ of the employee base was covered by the DB plan.
- If 60% or less of the employees had access to the DB plan, the change in the optimal equity allocation was less than five percentage points at each age level.
- Even if 80% of employees were DB eligible, the change in the optimal equity allocation was less than 10 percentage points at all ages. However, the shift was much more significant if 100% of the employee population were DB eligible.

Thus, we believe that sponsors who decide to close their DB plan to new participants would do well to also reassess their QDIA glide paths, because those without DB benefit coverage likely will have a material impact on overall glide path suitability.

Figure 3 highlights the changes in equity allocation based on the DB eligibility of the participant population at age 65—the

most frequent retirement age. Here again we see that the indicated drop off in equity exposure is largest when a significant portion of all employees are eligible for the DB plan.

While DB benefit eligibility is often binary, particularly for closed plans, the reality can be a little more complex for frozen DB plans because the financial situation of each employee with access to the plan will differ based on the length and trajectory of their career prior to the plan freeze. However, at any given freeze date there are likely to be DB participants with minimal accrued benefits, while everyone subsequently hired will not have access to the plan at all.

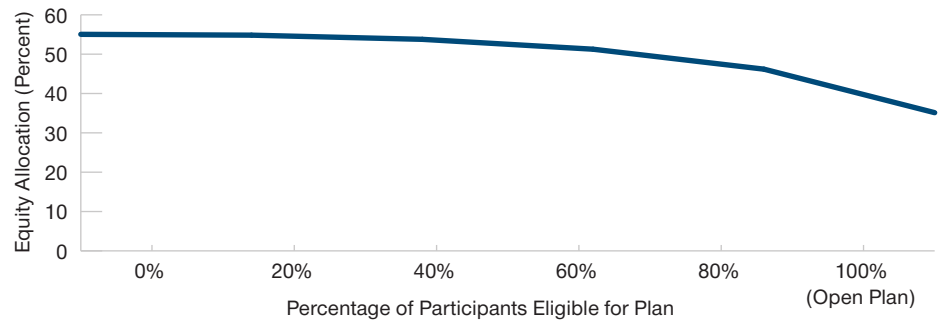
Considerations for Plan Sponsors

So, should sponsors simply pick the glide path that reflects the percentage of their workforce eligible for their DB plan? No, not necessarily.

- Basing the glide path directly on DB eligibility could prove challenging administratively, given that the share of the total workforce eligible for DB plan benefits would continue to drop as employees with defined benefits left the company and were replaced by employees who did not have access to the plan.

The Optimal Equity Allocation at Retirement Remained Relatively High Unless DB Plan Eligibility Was Above 80%

(Fig. 3) Hypothetical equity allocations at age 65 based on DB plan eligibility



For illustrative purposes only. Not representative of an actual investment or T. Rowe Price product. This analysis contains information derived from a Monte Carlo simulation. See Appendix for important information.

Source: T. Rowe Price.

- In our view, seeking to maximize utility for participants who do not have access to the DB plan should be the goal that drives glide path selection. Why? Because the retirement income profile of participants with DB benefits is relatively more secure. Therefore, the glide path that potentially provides the greatest utility for the entire participant base should closely resemble the utility-maximizing glide path in cases where there is no DB plan at all.

denominator,” which is to assume that there is no DB plan at all. As time progresses, those without DB benefits will become the dominant population within the workforce (if they are not already), and there will be no need to switch glide paths at that point. Our analysis for frozen plans follows the same logic, meaning that the frozen DB benefit should have minimal impact on a utility-maximized glide path across the overall employee population.

Our analysis of closed plans shows that unless there is a DB plan open to all participants, sponsors should consider solving for the “lowest common

The logical next question, though, is: To what extent could participants with DB benefits be disadvantaged by a glide path that doesn’t reflect their own

We Define Glide Path Risk and Reward in Terms of Specific Retirement Outcomes

(Fig. 4) Metrics conveying utility under assumed preferences

	Consumption	Wealth
Reward	<p>Consumption Replacement</p> <p>Annual consumption that can be supported, on average, postretirement, by in-plan assets and projected sources of secure income, such as Social Security benefits or pension annuities from DB plans.</p>	<p>Wealth at Retirement</p> <p>Average wealth at retirement expressed as a multiple of final preretirement consumption in real terms.</p>
Risk	<p>Expected Shortfall</p> <p>Measure of consumption risk, combining the probability of lower spending with the magnitude of the spending cut.</p>	<p>Maximum Drawdown</p> <p>Measures average simulated maximum drawdown on a monthly basis during the years leading up to retirement or shortly after retirement.</p>

Source: T. Rowe Price.

level of retirement preparedness? The answer is: minimally.

Figure 4 defines the key retirement outcome metrics in our glide path utility model. Figure 5 shows potential outcomes for those same metrics for two hypothetical DC plan participants, Participant One and Participant Two. Participant One has access to a DB plan in addition to the DC plan, while Participant Two has DC plan coverage only. Using Monte Carlo simulation, we compared potential outcomes for each participant from two assumed glide

paths: one designed to reflect their own specific situation, and the other one optimized based on the DB status of the other participant.

Our analysis suggests that while a DC-only glide path may give participants who have DB benefits higher equity exposure than they need, there are offsetting potential benefits. In our example, the DC-only glide path produced a somewhat larger maximum drawdown and a lower utility score for Participant One (the employee with DB coverage), but they were compensated with improved outcomes on

Outcomes for Participants Who Are Not Defined Benefit Eligible Should Drive Glide Path Selection

(Fig. 5) Hypothetical outcomes for participants based on DB plan status and assumed glide path

Participant One (Has Access to DB Plan)

Assumed Glide Path	Hypothetical Outcomes				Overall Utility Score
	Consumption Replacement	Expected Shortfall	Multiple of Preretirement Consumption Saved at Retirement	Maximum Drawdown	
Optimal Glide Path for Participant One	113.9%	6.1%	11.0	34.9%	0.72
Optimal Glide Path for Participant Two	127.2	5.4	12.6	37.1	0.71
Impact on Participant One of Following the Optimal Glide Path for Participant Two	Consumption Increased by 11.7%	Shortfall Risk Decreased by 11.5%	14.5% More Wealth at Retirement	Maximum Drawdown Increased by 6.3%	

Participant Two (Does Not Have Access to DB Plan)

Assumed Glide Path	Hypothetical Outcomes				Overall Utility Score
	Consumption Replacement	Expected Shortfall	Multiple of Preretirement Consumption Saved at Retirement	Maximum Drawdown	
Optimal Glide Path for Participant Two	95.8%	19.3%	12.2	37.1%	0.71
Optimal Glide Path for Participant One	83.1%	22.2%	10.5	34.9%	0.65
Impact on Participant Two of Following the Optimal Glide Path for Participant One	Consumption Decreased by 13.3%	Shortfall Risk Increased by 15.0%	13.9% Less Wealth at Retirement	Maximum Drawdown Reduced by 5.9%	

Results shown are hypothetical and for illustrative purposes only. This does not represent the results of an actual investment or T. Rowe Price product. This analysis contains information derived from a Monte Carlo simulation. See Appendix for important information.

Source: T. Rowe Price.

several other fronts: higher consumption replacement, a lower expected shortfall, and a higher balance at retirement.

The opposite is true for Participant Two (the DC-only participant). Following a glide path designed for participants that also have access to the DB plan increases Participant Two's expected shortfall risk by 15.0%, a substantial rise. In addition, moving from 95.8% to only 83.1% of preretirement consumption replacement likely would require Participant Two to make some very challenging spending decisions.

For Participant One, the nearly 12% increase in preretirement consumption replacement provided by the DC-only glide path no doubt would be an easier adjustment to make. However, that increase does come with more risk—and, thus, given the preferences we used, would not maximize overall utility.

Conclusions

All else being equal, participants who have legacy DB benefits should be better prepared for retirement than participants who do not. This means that a glide path not specifically calibrated for the presence of DB

benefits should have less overall impact on key retirement metrics for employees with DB plan coverage than a glide path design that *does* account for DB plan benefits would have for employees who will need to rely more heavily on their DC plans for retirement income.

We believe sponsors should carefully consider the needs of participants who do not have access to the DB plan when evaluating glide paths for their QDIAs or other target date offerings. These are the employees who will rely most on their DC plans to meet retirement goals, and, most likely, are also the ones who will have a significant portion of their total wealth invested in their DC plan account.

The fourth installment of our *Making the Benefit Connection* series will further explore the wealth and substitution effects—i.e., does the additional wealth and better retirement preparedness made possible by DB plan benefits typically imply the appropriateness of a lower-equity glide path for the QDIA in a companion DC plan? What if we control retirement programs for wealth and consider the possibility that freezing a DB plan might create the opportunity to offer a more generous DC plan?

Appendix

Key Modeling Plan Design Parameters

DB Plan: A final average pay plan that pays a single life annuity with the following benefit formula:

Normal retirement benefit at normal retirement date = 1% x average of final five years of pay x years of service.

For the purposes of this paper, we don't assume any subsidized early retirement benefits or cost-of-living adjustments. These topics will be addressed in future installments of this series.

DC Plan: Safe harbor plan design with employer matching up to 100% of the first 3% of employee deferrals and 50% of the next 2%. We assume all contributions are pretax and that contributions increase over time according to our proprietary deferral rate growth model.

Key Assumptions About the Demographic Analysis

Assumptions: Participant income grows using a proprietary salary growth model calibrated on the T. Rowe Price recordkeeping platform. The participants retire at age 67 and begin withdrawing income to support steady inflation-adjusted spending over retirement.

The projections or other information generated regarding the likelihood of certain outcomes are not guarantees of future results. This analysis is based on assumptions, and there can be no assurance that the projected results will be achieved or sustained.

Actual results will vary, and such results may be better or worse than the assumed scenarios.

Additional Disclosure

Monte Carlo simulations model future uncertainty. In contrast to tools generating average outcomes, Monte Carlo analyses produce outcome ranges based on probability --thus incorporating future uncertainty.

Material Assumptions include:

- Underlying economic and behavioral inputs, including savings rates and cash flows, are generated from a structural model built up from factors relating to both financial markets and the broad economy as well as data calibrated based on T. Rowe Price's recordkeeping platform's participant population.
- The mortality weighting is sourced from the Society of Actuaries. Retirement age is assumed to be 67 years old.

Material Limitations include:

- The analysis relies on assumptions, combined with a return model that generates a wide range of possible return scenarios from these assumptions. Despite our best efforts, there is no certainty that the assumptions and the model will accurately predict asset class return ranges going forward. As a consequence, the results of the analysis should be viewed as approximations, and users should allow a margin for error and not place too much reliance on the apparent precision of the results.

Users should also keep in mind that seemingly small changes in input parameters, including the initial values for the underlying factors, may have a significant impact on results, and this (as well as mere passage of time) may lead to considerable variation in results for repeat users.

- Extreme market movements may occur more often than in the model.
- Market crises can cause asset classes to perform similarly, lowering the accuracy of our projected return assumptions, and diminishing the benefits of diversification (that is, of using many different asset classes) in ways not captured by the analysis. As a result, returns actually experienced by the investor may be more volatile than projected in our analysis.
- Asset class dynamics, including but not limited to risk, return and the duration of "bull" and "bear" markets, can differ than those in the modeled scenarios.
- The analysis does not use all asset classes. Other asset classes may be similar or superior to those used.
- Fees and transaction costs are not taken into account.
- The analysis models asset classes, not investment products. As a result, the actual experience of an investor in a given investment product may differ from the range of projections generated by the simulation, even if the broad asset allocation of the investment product is similar to the one being modeled. Possible reasons for divergence include, but are not limited to, active management by the manager of the investment product. Active management for any particular investment product—the selection of a portfolio of individual securities that differs from the broad asset classes modeled in this analysis—can lead to the investment product having higher or lower returns than the range of projections in this analysis.

Modeling Assumptions:

- The primary asset classes used for this analysis are stocks and bonds. An effectively diversified portfolio theoretically involves all investable asset classes including stocks, bonds, real estate, foreign investments, commodities, precious metals, currencies, and others. Since it is unlikely that investors will own all of these assets, we selected the ones we believed to be the most appropriate for long-term investors.
- The analysis includes 10,000 scenarios. Withdrawals are made annually at the beginning of each year.
- **IMPORTANT:** The projections or other information generated by T. Rowe Price regarding the likelihood of various investment outcomes are hypothetical in nature, do not reflect actual investment results and are not guarantees of future results. The simulations are based on assumptions. There can be no assurance that the projected or simulated results will be achieved or sustained. The charts present only a range of possible outcomes. Actual results will vary with each use and over time, and such results may be better or worse than the simulated scenarios. Clients should be aware that the potential for loss (or gain) may be greater than demonstrated in the simulations.
- The results are not predictions, but they should be viewed as reasonable estimates.

INVEST WITH CONFIDENCESM

T. Rowe Price focuses on delivering investment management excellence that investors can rely on—now and over the long term.

T.RowePrice[®]

Important Information

This material is being furnished for general informational and/or marketing purposes only. The material does not constitute or undertake to give advice of any nature, including fiduciary investment advice, nor is it intended to serve as the primary basis for an investment decision. Prospective investors are recommended to seek independent legal, financial and tax advice before making any investment decision. T. Rowe Price group of companies including T. Rowe Price Associates, Inc. and/or its affiliates receive revenue from T. Rowe Price investment products and services. **Past performance is not a reliable indicator of future performance.** The value of an investment and any income from it can go down as well as up. Investors may get back less than the amount invested.

The material does not constitute a distribution, an offer, an invitation, a personal or general recommendation or solicitation to sell or buy any securities in any jurisdiction or to conduct any particular investment activity. The material has not been reviewed by any regulatory authority in any jurisdiction.

Information and opinions presented have been obtained or derived from sources believed to be reliable and current; however, we cannot guarantee the sources' accuracy or completeness. There is no guarantee that any forecasts made will come to pass. The views contained herein are as of the date written and are subject to change without notice; these views may differ from those of other T. Rowe Price group companies and/or associates. Under no circumstances should the material, in whole or in part, be copied or redistributed without consent from T. Rowe Price.

The material is not intended for use by persons in jurisdictions which prohibit or restrict the distribution of the material and in certain countries the material is provided upon specific request. It is not intended for distribution to retail investors in any jurisdiction.

Canada—Issued in Canada by T. Rowe Price (Canada), Inc. T. Rowe Price (Canada), Inc.'s investment management services are only available to Accredited Investors as defined under National Instrument 45-106. T. Rowe Price (Canada), Inc. enters into written delegation agreements with affiliates to provide investment management services.

USA—Issued in the USA by T. Rowe Price Associates, Inc., 100 East Pratt Street, Baltimore, MD, 21202, which is regulated by the U.S. Securities and Exchange Commission. For Institutional Investors only.

© 2021 T. Rowe Price. All Rights Reserved. T. ROWE PRICE, INVEST WITH CONFIDENCE, and the Bighorn Sheep design are, collectively and/ or apart, trademarks of T. Rowe Price Group, Inc.