

## The Dual Portfolio Framework

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One of the most important decisions facing investors is how best to balance their risk and return objectives. Stated another way, investors must find the optimal trade-off between the goal of maximizing their long-term returns while addressing concerns such as spending, liquidity, or solvency requirements. One approach to meeting this balance is by using a dual portfolio framework.

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A dual portfolio framework recasts the investment portfolio into two broad categories, risk-mitigating and return-seeking, to allow us to separately identify key risks at the total Plan level. This approach is especially useful within an asset-liability framework. First, it allows an investor to customize a portfolio based on their unique plan profile. Second, specific fixed income securities and strategies can be avoided to better meet investor needs. Finally, the amount of credit risk in both equities and bonds is more transparent such that investors are less prone to taking on an undesired amount of credit risk

### Introduction

A dual portfolio framework recasts the investment portfolio into two broad categories:

- Risk Mitigating Portfolio (RMP),<sup>1</sup> and
- Return-Seeking Portfolio (RSP).

<sup>1</sup> Sometimes referred to as the Hedge Portfolio or the Minimum Risk Portfolio. We will use RMP throughout this report.

### The Risk-Mitigating Portfolio defined

A very broad definition of the RMP is a portfolio that will invest in strategies that primarily provide protection against equity market downturns and the widening of credit spreads. This could encompass long-duration fixed income, alternative risk premia (ARP), managed futures, and tail risk hedging strategies, including a litany of equity and credit risk mitigation strategies. The introductory case study (Section II) takes a more narrow definition, where long duration bonds are added to the RMP to improve the match of assets to liabilities.<sup>2</sup>

<sup>2</sup> The RSP comprises the excess assets invested to generate higher returns; the details are beyond the scope of this report.

## Section I: Advantages of the dual portfolio framework

For most investors, a broad-based allocation to fixed income—such as a portfolio that resembles the Bloomberg Barclays US Aggregate Bond Index (BBAG)—is appropriate. However, for an increasing number of institutional investors, a Dual Portfolio Framework affords at least three key advantages:<sup>3</sup>

<sup>3</sup> Some investors amend their Investment Policy Statement (IPS) to explicitly recognize this framework.

- 1. Customization by plan profile** The specific needs and profile of the plan and/or sponsoring entity can be custom tailored when constructing the RMP.
- 2. Addition by subtraction** Specific fixed income securities and strategies can be avoided in the RMP construction to better meet investor needs; and
- 3. Understanding credit risk** The amount of credit risk in both equities & bonds is more transparent, thus reducing the likelihood of investors taking on an unnecessary or undesired amount of credit risk.

We explore each of these three advantages in more detail.

### Customization by plan profile

Statutory and regulatory considerations, in addition to risk and return preferences, can result in very different asset allocations across the various types of investors (e.g., public pension plan versus a corporate pension plan). In fact, we observe that the asset allocation for two plans in the same sector (e.g., two Property & Casualty Insurers) can differ dramatically in the construction of the RMP.

Examples of customization include:

- As part of a Corporation's firm-wide ERM framework, they consider their pension plan as a Special Purpose Entity (SPE). Thus, their RMP has a significant allocation to fixed-income securities that closely resemble the payout profile;
- An endowment considers fixed income assets as an "anchor to windward";
- A foundation's primary goal is to meet its spending policy of a minimum of 5% per annum, plus inflation;
- A public pension plan considers long Treasuries as a left-tail or crisis hedge;
- A multi-employer plan, with relatively high negative cash flow, positions their RMP in a manner that better balances their near-term payments and longer term objectives;
- A Nuclear Decommissioning Trust (NDT) is primarily concerned with the risk of inflation; and
- A Property & Casualty insurer views the RMP as a hedge against their (run off) liabilities, and their surplus assets as a return-seeking portfolio.<sup>4</sup>

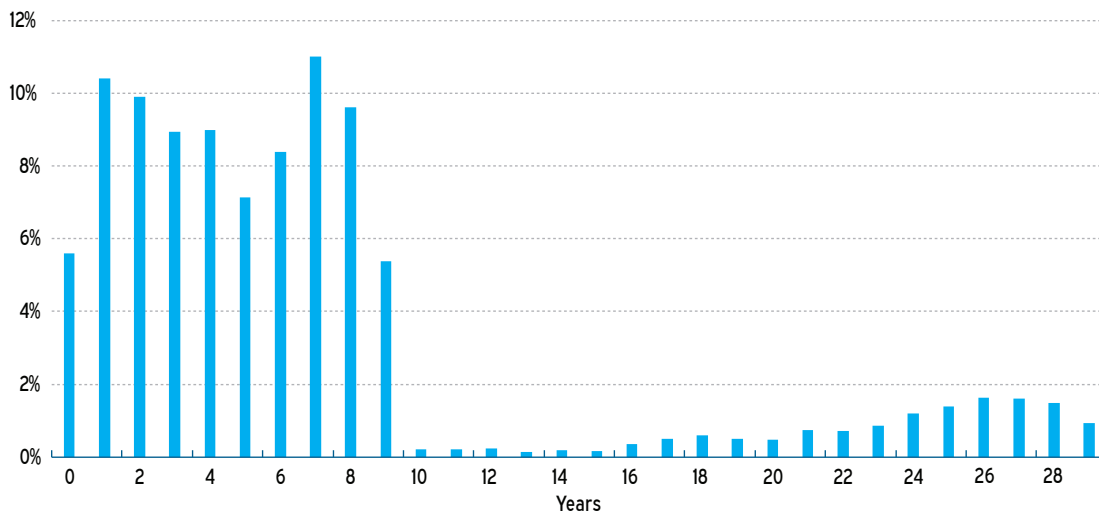
<sup>4</sup> Please see our 2012 paper "Dynamic Asset Allocation" for an analogous example.

The RMP can be customized depending on the type of plan and its specific objectives, as opposed to relying on an off-the-shelf product. The duration<sup>5</sup> of the BBAG is roughly six years, which does not necessarily meet the investor's objectives in constructing the RMP. For example, the duration of the BBAG:

- Is much shorter than the duration of a typical pension liability, and/or
- Could be significantly longer than the requirements of a typical property insurer.

### Addition by subtraction

The vast majority of fixed income investors benchmark or invest directly in the BBAG Index. This "core" index has just under 10,000 fixed income securities and the following duration profile:<sup>6</sup>



**FIGURE 1**  
**BBAG: Distribution by Duration**  
Source: Bloomberg

The Dual Portfolio addresses two specific issues with the BBAG benchmark.

### Negative convexity<sup>7</sup>

There is an inverse relationship between bond prices and interest rates. In a declining (increasing) interest rate environment, the price of these bonds increase (decrease). Treasury securities have a property called positive convexity, in which the more rates decline, the faster their prices increase—and conversely, the more rates increase, the slower their prices decrease. This win-win is illustrated by the blue curve between points A and B below (see Figure 2). Thus, Treasuries provide the necessary protection when most needed.

Unlike Treasuries, other bonds that have callable features exhibit negative convexity (see Figure 2). This means the bonds are likely to be called (i.e., prepaid) right when their protection is most needed. Here, the more interest rates decline (increase), the slower their price will increase (faster their price will decrease). This is illustrated by the red curve between points C and D below. In the BBAG, over 50% of the securities

<sup>5</sup> Using approximate bond math, a 1% or 100 bps increase in interest rates with respect to a fixed income portfolio with a duration of six years, equates to a 6% capital loss in the portfolio.

<sup>6</sup> For additional details on the BBAG, please see our 2018 paper "The Changing Nature of Core Bonds."

<sup>7</sup> For additional details on the BBAG and examples of negative convexity, please see our 2018 paper "The Changing Nature of Core Bonds."

<sup>8</sup> Fixed income investors demand a higher yield to compensate for this optionality."

exhibit negative convexity (see Figure 3); this significantly weakens the protection from such a fixed income basket compared to a portfolio of Treasuries.<sup>8</sup>

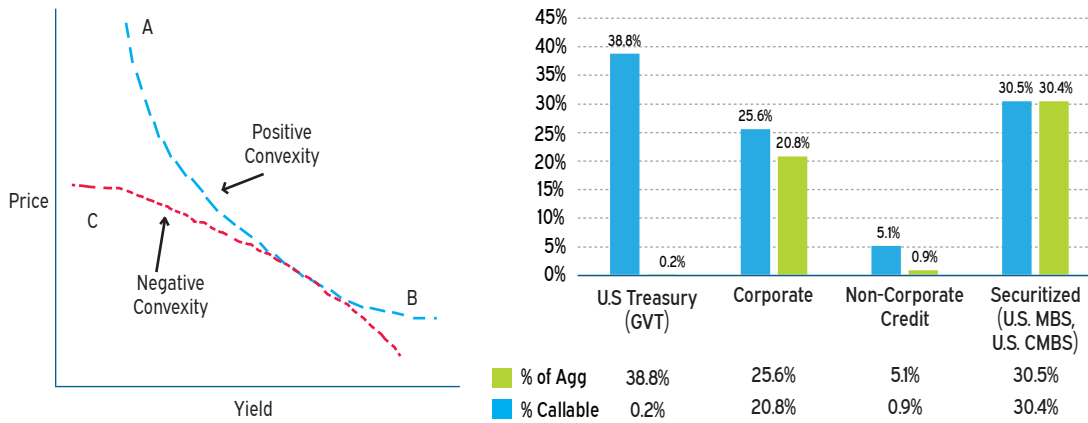


FIGURE 2

**Bond Convexity (left)**

Source: Bloomberg

FIGURE 3

**BBAG: Callable vs. Non-Callable (right)**

One of the primary concerns with the BBAG is that it is a reflection of where in the term structure corporations and sovereign issuers prefer to issue debt. Issuers rightfully want to issue in the cheapest part of the curve and minimize costs (risk), whereas investors want to maximize return (spread). Thus, by purchasing the index, investors are by default, in this “no man’s land” of being exposed to the belly (i.e., the five to six year part) of the curve.

The RMP can be constructed to avoid both of these risks by avoiding specific fixed income securities. For example, this can be done by avoiding or owning fewer callable bonds, or structuring the portfolio with a different duration profile.

**Understanding credit risk**

We find a high correlation between equity returns and fixed income spreads. For example, over a 14-year period, the correlation of investment grade (IG) spreads to equity returns was 73% and the correlation of high yield spreads to equity returns was 83%.

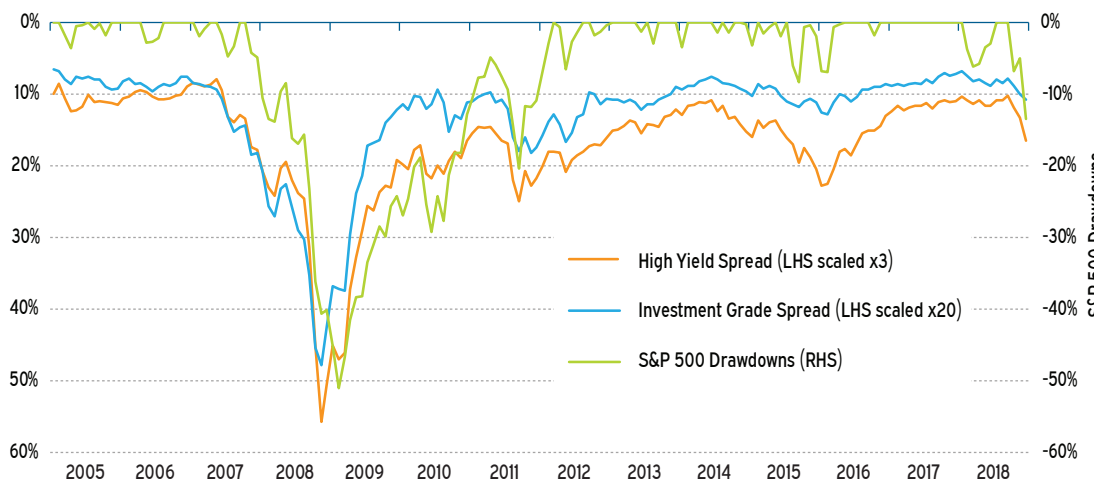


FIGURE 4

**Equity Volatility, Credit Spreads, and Equity Drawdowns**

**January 2005–December 2018**

Source: Meketa Investment Group, Bloomberg

Why does this matter? In the quest for superior fixed income returns, investors typically overweight credit to pick up additional yield, even as this weakens the bonds' hedging characteristics. Thus, the equity and bond portfolios are simultaneously exposed to correlated equity and credit risks. To avoid or mitigate this “doubling-down” on similar risks, the Dual Portfolio Framework allows for a more deliberate approach to the credit decision. More specifically, this action separates the decision to take on interest rate exposure from the credit risk embedded in both equities and bonds.

## Section II: Corporate pension plan case study

In this section, we provide an example of the framework in practice.

### Background

A corporate pension plan would like to better understand the relationship between their assets and their future obligations (i.e., their liabilities) with a goal of decreasing their asset-liability mismatch risk. The decision to introduce a long-duration fixed income portfolio—to better align assets and liabilities—has been delayed for almost a decade as the Investment Committee (IC):

- Was unwilling to reduce their expected long-term return target, which would be a result of shifting assets from equities to fixed income;
- Was unwilling to accept the risk of an increase in interest rates resulting in a larger loss for their investment portfolio;<sup>9</sup> and
- Believed that Liability Driven Investing (LDI) implied owning only long bonds.

<sup>9</sup> A long-duration portfolio, with a duration of 15 years, would suffer a 15% loss if interest rates increased by 100 bps (versus a 6% loss for a six-year duration shown earlier). Conversely, liabilities would decrease by a larger margin, thus improving the funded status.

The pension plan was 80% funded with the following asset allocation:

Traditional IPS	Target Weight (%)
Fixed Income	35
U.S. Equity	25
Non-U.S. Equity	20
Private Equity	10
Hedge Funds	5
Real Estate	5
<b>Total Assets</b>	<b>100</b>

By introducing a Dual Portfolio Framework, the Investment Committee was better positioned to:

- Separate the tactical and strategic decisions needed to alter their asset allocation;
- Clearly articulate their risk and return objectives; and
- Introduce a long-duration fixed income portfolio.

To prepare a detailed liability analysis, two key items had to be requested and resolved:<sup>10</sup>

<sup>10</sup> Several other data items and reports are also needed. The typical asset information - Investment Policy Statement (IPS), Trust statements, etc. Although not an exhaustive list, core liability data items included valuation reports, accounting letters, statutory filings, Summary Plan Descriptions, etc.

### The schedule of benefit payments

In order to do any asset-liability analysis, a schedule of benefit payments is needed from the actuary to develop an understanding of what the plan would pay out over the next several decades. A sample benefit profile is shown below:

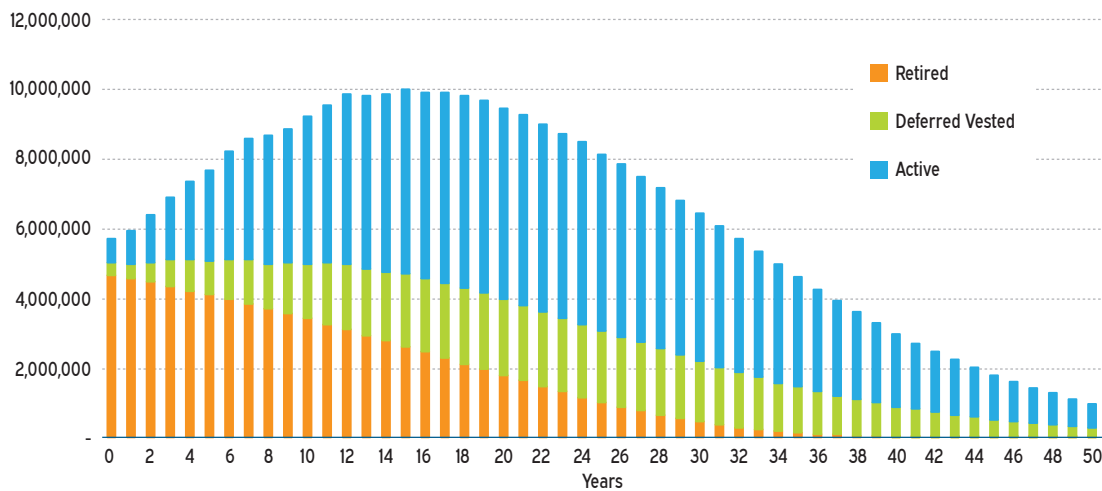


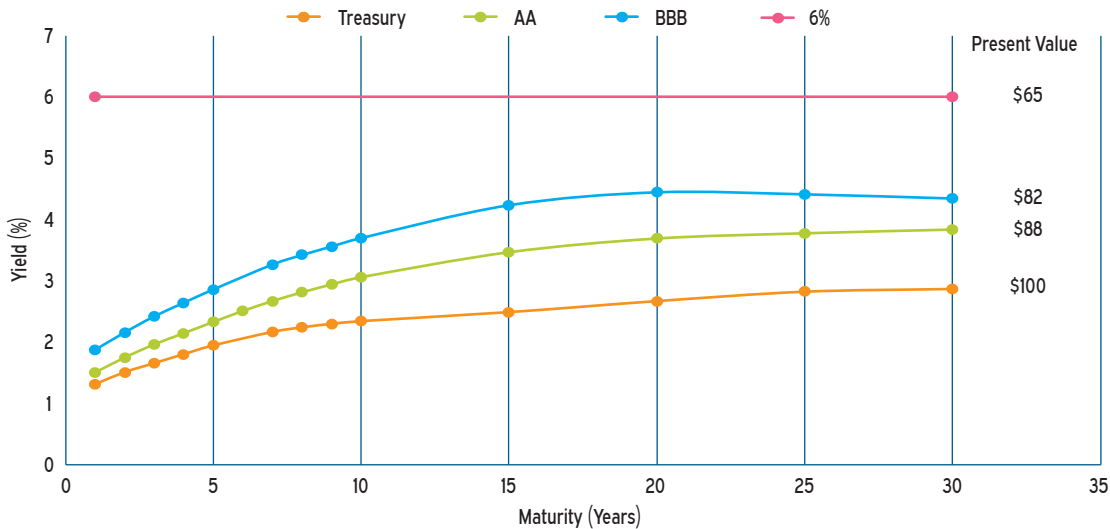
FIGURE 5

Benefit Payout Profile

### One liability valuation: What applicable discount rate or yield curve to use?

The pension plan had an expected long-term return assumption (EROA) of 6.0%. However, in the normal course of operating a pension plan, there are significant additional liability measures that serve to complicate matters.<sup>11</sup> So, how should we discount the benefit profile provided above? As Figure 6 below illustrates, the choice of yield curve (and 6.0%) leads to significant differences in liability values (i.e., present values).

<sup>11</sup> Examples include PPA Spot curve, PPA three-tiered curve, PBGC rates, Accounting, and other custom yield curves.



**FIGURE 6**  
**U.S. Treasury and Corporate Yield Curves**  
**December 31, 2018**

Source: Bloomberg

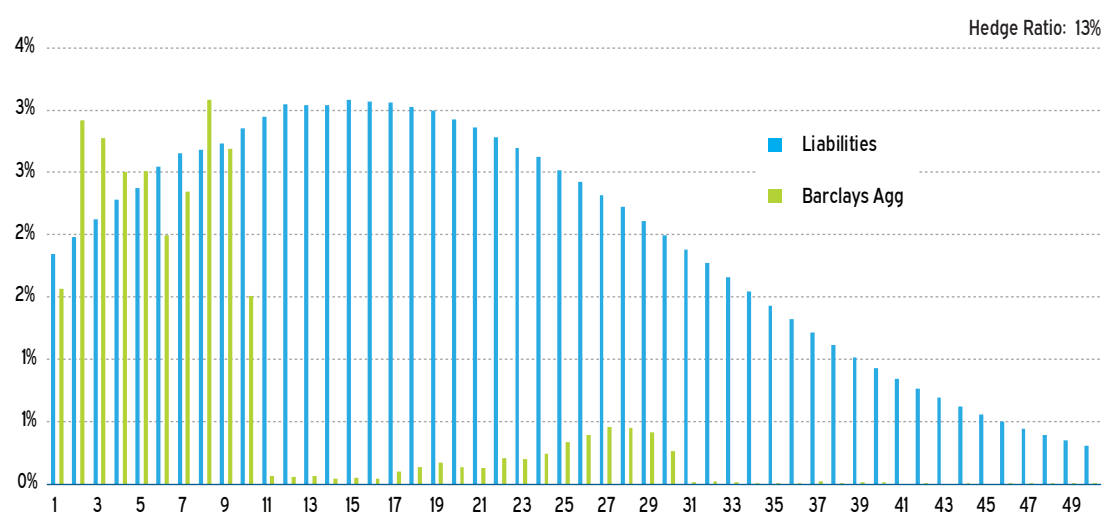
In this case, an accounting based yield curve was used to discount the benefit profile.<sup>12</sup> Accounting considerations were the primary driver of this choice.

<sup>12</sup> The IPS was amended to use an accounting norm of the AA-rated yield curve.

**A first look at the current portfolio**

With two critical pieces of information in place—the benefit profile and the applicable yield curve—we were able to calculate a number of key statistics, such as the hedge ratio.<sup>13</sup> As shown in Figure 7 below, the BBAG does an adequate job (vis-à-vis hedging the benefit profile) in the first ten years. However, this benchmark is significantly “short” duration (relative to the benefit profile), thus resulting in a hedge ratio of only 13%.

<sup>13</sup> In general terms, the hedge ratio (HR) equals the funded ratio multiplied by the duration of assets divided by the duration of liabilities. Simply stated, a HR of 100% suggests the assets and liabilities “move” perfectly together. An HR of 0% suggests the assets move independently from the liabilities. For this analysis, the duration of non fixed income assets were assumed to be zero.



**FIGURE 7**  
**Comparison of Benefit Profile to BBAG**

Source: Meketa Sample Benefit Profile, Bloomberg

Now armed with the three primary advantages of the Dual Portfolio Framework as well as a customized “picture” of their assets and liabilities, the Investment Committee outlined the following additional goals:

- Construct a bond portfolio that specifically covers the first five years of cash flows,
- Take a small de-risking step by allocating to long-duration bonds, with the aim of increasing the hedge ratio by roughly 10%, and
- Focus on simplicity for now, with the goal of building a more sophisticated portfolio later as funded status and allocation to long-duration assets increase. Thus, a decision was made to use broad-based market benchmarks for the near term.

## Implementation

After some back-and-forth, the initial objectives of the Investment Committee were met. The profile of the RMP is a barbell approach with the following key attributes and results:

- A 10% allocation to short-duration fixed income, benchmarked to the Bloomberg Barclays Government/Credit 1-5 Year index;
- A 25% allocation to long-duration fixed income, benchmarked to the Bloomberg Barclays Government/Credit Long index;
- The hedge ratio increased to 23% (from 13%); and
- Adds some credit risk in the asset allocation.

Dual Portfolio IPS	Target Weight (%)	Benchmark
<b>Risk Mitigating Portfolio</b>	<b>35</b>	
Short Duration Fixed Income	10	Gov't/Credit 1-5
Long Duration Fixed Income	25	Long Gov't/Credit
<b>Return Seeking Assets</b>	<b>60</b>	
U.S. Equity	20	TBD
Non-U.S. Equity	20	TBD
Private Equity	10	TBD
Credit Opportunities	5	TBD
Real Estate	5	TBD
<b>Hedge Funds (Return Seeking)</b>	<b>5</b>	<b>TBD</b>
<b>Total Assets</b>	<b>100</b>	

Although this simple first step results in a “lumpy” or barbell-shaped hedging profile (see Figure 8), the primary goals of adopting a dual portfolio approach—increasing duration and a better appreciation of how their assets and liabilities correlate—were achieved.



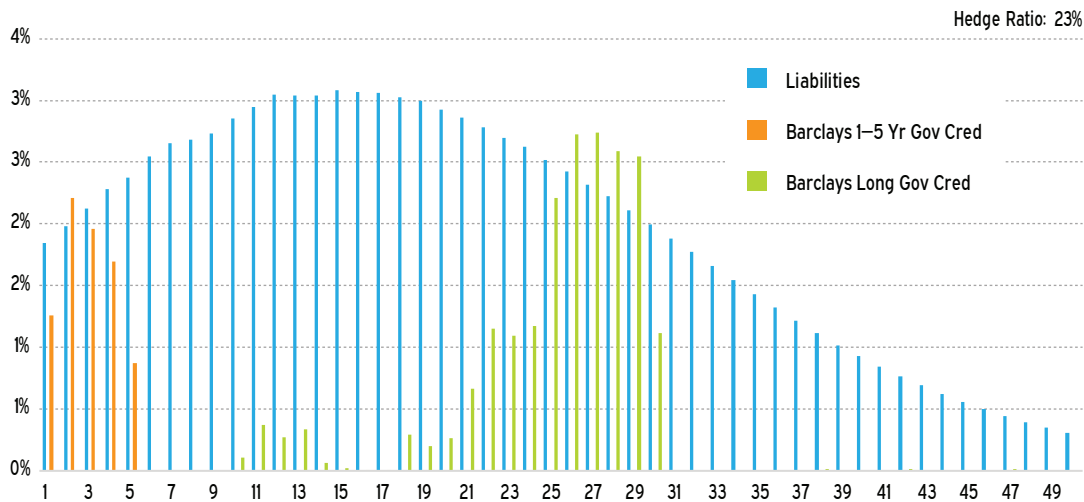


FIGURE 8

**Comparison of Benefit Profile to Asset Allocation**

Source: Meketa Sample  
Benefit Profile, Bloomberg

**Future considerations**

The case study in this analysis sought to demonstrate some basic concepts. That is, it reflected a step along a path, not the full journey. Future considerations for this plan include:

- Using derivative/overlay strategies to increase the hedge ratio while maintaining their long-term (6.0%) return objective;
- Using a systematic glide path strategy to increase the allocation to long duration fixed income with a conscious understanding that the portfolio’s long-term expected return will likely decrease;
- Exploring dynamic hedging; and
- Exploring the use of custom fixed income portfolios (i.e., customized benchmarks).

**Closing thoughts**

A dual portfolio framework recasts the investment portfolio into two broad categories, risk mitigating and return-seeking, to allow us to separately identify key risks at the total Plan level. First, it allows an investor to customize a portfolio based on their unique plan profile. Second, specific fixed income securities and strategies can be avoided to better meet investor needs. Finally, the amount of credit risk in both equities and bonds is more transparent such that investors are less prone to taking on an undesired amount of credit risk.

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