Executive summary. As corporations try to find the optimal trade-off between risk and return in their pension portfolios, many are evaluating the strategy known as “derisking.” This involves moving assets, as funded status improves, from riskier, return-generating holdings into longer-term fixed income holdings that better align with the pension liability.

For some plan sponsors, however, derisking presents a challenge because, as the fixed income allocation grows, the long-term expected rate of return on assets (EROA) decreases. This reduced EROA assumption results in a larger pension expense on the company’s profit-and-loss statement.

On the other hand, derisking occurs as the plan’s funded status is improving, and pension expense will generally decrease as funded status improves. This improvement in funded status can offset the decline in EROA. This paper describes the offsetting effect, which—when combined with the advantages of derisking—may encourage sponsors to go ahead with a derisking strategy.
As corporations around the country look to improve their pension plans’ funded status and reduce volatility, many companies face challenging decisions on how to accomplish these goals. An approach being considered by many plans involves “derisking” the portfolio as funded status improves. Under this approach, assets are moved from riskier, return-generating holdings (generally equities) into longer-term fixed income instruments that better align with the pension liability.

One hurdle for those considering this approach is that as the equity allocation shrinks and the bond component rises, the expected return of the portfolio declines. This occurs because fixed income investments are generally expected to have lower returns than equities.

The decline in long-term expected return on assets is troublesome for many plan sponsors because it directly affects the company’s pension expense. When expected return drops, the company must reduce the EROA assumption for its expense calculation under Accounting Standards Codification (ASC) Topic 715. This reduction increases the pension expense a company must charge to its profit-and-loss statement.

However, in a properly designed derisking strategy, the pension assets move from equities to fixed income only when the funded status of the plan is improving. The increase in the portfolio’s asset base thus offsets the decrease in EROA, reducing the impact on the current pension expense amount. From a management perspective, this offsetting effect can make the derisking process easier to deal with, as decreases in the EROA don’t occur until there is a corresponding increase in the asset base.

Here we examine the derisking process, how it affects a particular plan’s pension expense, and other expense considerations involved in derisking.

### Pension plan derisking

The rationale for derisking a pension portfolio as the funded status improves is based on the change in the risk-return tradeoff. At lower levels of funding, seeking higher returns with riskier assets has the potential to pay off with lower costs over time. However, at higher levels of funding, higher returns may result in excess assets, which are not needed to pay the benefits promised by the plan, and in unnecessary risk-taking; a lower-risk, lower-expected-return approach then makes more sense. Once the plan is well funded, the objective is to maintain the funded status rather than improve it, because improving it may not have substantial value.

---

**Figure 1.** How expected return can change as a portfolio shifts toward fixed income

These EROA figures represent sample long-term expectations at various asset allocations. Figures for actual plans will vary according to the assets held and the sponsor’s assumptions, but could be expected to decline in a similar progression as the bond allocation rises.

<table>
<thead>
<tr>
<th>Example of funded status</th>
<th>Equity allocation</th>
<th>Fixed income allocation</th>
<th>EROA</th>
</tr>
</thead>
<tbody>
<tr>
<td>80%</td>
<td>60%</td>
<td>40%</td>
<td>7.50%</td>
</tr>
<tr>
<td>90%</td>
<td>40%</td>
<td>60%</td>
<td>6.50%</td>
</tr>
<tr>
<td>100%</td>
<td>20%</td>
<td>80%</td>
<td>5.50%</td>
</tr>
<tr>
<td>110%</td>
<td>0%</td>
<td>100%</td>
<td>4.50%</td>
</tr>
</tbody>
</table>

Note: The expected returns shown are hypothetical and are not based on any existing plan or set of assets. To determine actual EROA assumptions for a plan, the sponsor needs to conduct modeling of the specific asset holdings. The EROA is generally expected to reflect a long-term expected return on assets (30-plus years).

Source: Vanguard.

---

Note: All investing is subject to risks.

---

1. For a discussion of derisking and dynamic investment policy statements, see Bosse (2010).
2. Formerly known as Statement of Financial Accounting Standards 87 (FAS 87).
3. It should be noted that, despite the attention given to EROA and pension expense, this calculated expense is not considered a good indicator of the true economic cost of the pension plan. The reason is, in part, that EROA reflects an equity risk premium that has not been realized.
As discussed earlier, however, this derisking process decreases the EROA for the pension expense calculation. Figure 1 shows how the EROA might change as the asset allocation shifts from equities toward fixed income.

However, when derisking takes place as funded status improves, the impact of the decline in EROA is offset by a larger asset base. To examine this impact, let’s look at a hypothetical pension plan for Company XYZ, with the following characteristics:

- Projected benefit obligation (PBO): $100 million at a 5.50% discount rate.
- Market value of assets: $70 million.
- Expected benefit payments: $5 million.
- Service cost: $2 million.
- Gain/loss amortization payment: $4 million.
- Expected return on assets (EROA): 7.50%.
- Funded status: 70%.
- Current asset allocation: 60% equity, 40% fixed income.

Based on this data, the pension expense for Company XYZ is a little more than $6 million under ASC Topic 715 accounting rules (see the Appendix for details of the calculation). Now, let’s assume Company XYZ decides to make a large cash contribution to improve the funded status and wants to lock in the improved status to the extent possible with a larger fixed income allocation. Management may worry that the consequent reduction in EROA will increase the pension expense. It will; however, Figure 2 shows that, with the other variables held constant (service cost, gain/loss amortization payment, PBO, etc.), if the EROA decrease occurs when the asset base is increasing, the net effect on the pension expense may be minimal.

In this example, Company XYZ starts with a pension expense of $6.3 million (in bold). If the company makes contributions to improve funded status but continues to hold riskier assets, then its pension expense will move within the yellow-shaded area of Figure 2. On the other hand, if the fixed income allocation is increased before funding levels improve, the pension expense will be in the yellow shading, which shows how a growing asset base during derisking can counter the EROA decline resulting from a higher bond allocation.

This table shows how pension expense can change in tandem with a plan’s funded status and asset allocation. The yellow shading shows expense falling as assets grow because the stock allocation remains high, supporting a higher EROA—but risking greater volatility in funded status. The green shading shows how a growing asset base during derisking can counter the EROA decline resulting from a higher bond allocation.

<table>
<thead>
<tr>
<th>Starting asset base: $70 million</th>
<th>Starting liability: $100 million</th>
<th>Starting funded status: 70%</th>
</tr>
</thead>
<tbody>
<tr>
<td>EROA at various allocations and expected return levels</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60% stocks/40% bonds</td>
<td>60% stocks/40% bonds</td>
<td>60% stocks/40% bonds</td>
</tr>
<tr>
<td>Funded status</td>
<td>7.50%</td>
<td>6.50%</td>
</tr>
<tr>
<td>70%</td>
<td>$6.3M</td>
<td>$7.0M</td>
</tr>
<tr>
<td>80</td>
<td>5.6M</td>
<td>6.3M</td>
</tr>
<tr>
<td>90</td>
<td>4.8M</td>
<td>5.7M</td>
</tr>
<tr>
<td>100</td>
<td>4.1M</td>
<td>5.0M</td>
</tr>
<tr>
<td>110</td>
<td>3.3M</td>
<td>4.4M</td>
</tr>
<tr>
<td>120</td>
<td>2.6M</td>
<td>3.7M</td>
</tr>
</tbody>
</table>

Note: Both the expected returns and the pension expenses shown are hypothetical and are not based on any existing plan or set of assets.

Source: Vanguard.

As discussed earlier, however, this derisking process decreases the EROA for the pension expense calculation. Figure 1 shows how the EROA might change as the asset allocation shifts from equities toward fixed income.

However, when derisking takes place as funded status improves, the impact of the decline in EROA is offset by a larger asset base. To examine this impact, let’s look at a hypothetical pension plan for Company XYZ, with the following characteristics:

- Projected benefit obligation (PBO): $100 million at a 5.50% discount rate.
- Market value of assets: $70 million.
- Expected benefit payments: $5 million.
- Service cost: $2 million.
- Gain/loss amortization payment: $4 million.
- Expected return on assets (EROA): 7.50%.
- Funded status: 70%.
- Current asset allocation: 60% equity, 40% fixed income.

Based on this data, the pension expense for Company XYZ is a little more than $6 million under ASC Topic 715 accounting rules (see the Appendix for details of the calculation). Now, let’s assume Company XYZ decides to make a large cash contribution to improve the funded status and wants to lock in the improved status to the extent possible with a larger fixed income allocation. Management may worry that the consequent reduction in EROA will increase the pension expense. It will; however, Figure 2 shows that, with the other variables held constant (service cost, gain/loss amortization payment, PBO, etc.), if the EROA decrease occurs when the asset base is increasing, the net effect on the pension expense may be minimal.

In this example, Company XYZ starts with a pension expense of $6.3 million (in bold). If the company makes contributions to improve funded status but continues to hold riskier assets, then its pension expense will move within the yellow-shaded area of Figure 2. On the other hand, if the fixed income allocation is increased before funding levels improve, the pension expense will be in the yellow shading, which shows how a growing asset base during derisking can counter the EROA decline resulting from a higher bond allocation.

This table shows how pension expense can change in tandem with a plan’s funded status and asset allocation. The yellow shading shows expense falling as assets grow because the stock allocation remains high, supporting a higher EROA—but risking greater volatility in funded status. The green shading shows how a growing asset base during derisking can counter the EROA decline resulting from a higher bond allocation.
blue-shaded area. (Note that our calculation excludes potential financial impacts outside the pension plan; for example, additional cost of debt or reduced investment income related to transferring the contribution amount into the pension fund.)

Using a derisking approach, however, the decreases in EROA will occur as funded status improves. Then the impacts offset one another, and the pension expense is in the green-shaded area.

By using a dynamic derisking approach for plan asset allocations, companies can choose at what thresholds to move assets from equities to fixed income. Figure 2 shows that if they make these changes when asset levels improve, the EROA impact on pension expense is counteracted by an increase in the asset base.

**Other considerations for pension expense during derisking**

It is true that Figure 2’s yellow path, in which Company XYZ combines a riskier investment portfolio with a higher funded status, presents a substantially lower pension expense. Many plan sponsors may view this as the ultimate deciding factor. However, sponsors should weigh the benefit of reducing pension expense against the risks that can come with a higher equity allocation, including:

- **Increased volatility in funded status.** By maintaining a riskier portfolio, a company is exposed to higher volatility in funded status. Declines in funded status hurt a company’s balance sheet, and unexpected losses reduce a company’s equity under ASC Topic 715.

- **Shareholder concern.** Shareholders and analysts are increasingly aware of the potential risks pensions can pose to corporations, and they may frown on unnecessary risk-taking with pension assets. Additionally, analysts often evaluate pension expense in terms of the actual return on assets rather than the EROA assumption. From that standpoint, a higher EROA is irrelevant.

- **Potential changes to accounting rules.** Recently the International Accounting Standards Board (IASB) changed its rules regarding pension accounting. One major change was the removal of the EROA assumption from the pension expense calculation. This shift reduces the upside of risk-taking with pension assets, and it appears likely that U.S. accounting standards will follow suit in the coming years.

**Conclusion**

The process of obtaining and then maintaining a fully funded pension plan is challenging, with many hurdles to be faced along the way. One hurdle, though, the reduction in EROA, might not be as high as many sponsors have thought. This is because, as we have shown, the decline in EROA occurs when asset levels have risen, mitigating the impact on pension expense.

If the EROA reduction becomes less of an obstacle, the advantages of derisking—such as lower volatility in funded status and the balance sheet—become all the more compelling.

**References**


---

4 For a discussion of recent changes to the International Accounting Standards for pension plans, see Inglis (2011).
Appendix

Pension expense calculation for the hypothetical Company XYZ:

- Interest cost = PBO * discount rate – expected benefit payments * (discount rate / 2) = $100 million * 5.50% – $5 million * (5.50% / 2) = $5,362,500

- Expected return = market value of assets\(^5\) * EROA\(^6\) – expected benefit payments * (EROA / 2) = $70 million * 7.50% – $5 million * (7.50% / 2) = $5,062,500

- Service cost = $2,000,000

- Gain/loss amortizations = $4,000,000

- **Total pension expense** = Interest cost + service cost + gain/loss amortizations – expected return = $5,362,500 + $2,000,000 + $4,000,000 – $5,062,500 = $6,300,000

---

\(^5\) In Figure 2, on page 3, the market value of assets changes with the change in funded status. For example, the plan begins at 70\% funded status, corresponding to a $70 million asset level, and when the funded status is at 90\%, the market value of assets is assumed to be $90 million.

\(^6\) In Figure 2, the EROA changes are assumed to correspond with changes in asset allocation. Changes in the EROA are then reflected in the pension expense calculation.
Connect with Vanguard® > vanguard.com

Vanguard research >
Vanguard Center for Retirement Research
Vanguard Investment Counseling & Research
Vanguard Investment Strategy Group

E-mail > research@vanguard.com

CFA® is a trademark owned by CFA Institute.