

Managing and mitigating a pension plan's impact on financial statements

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- The growth in pension liabilities within the United States, along with expanded disclosure requirements and the use of market-based accounting standards for financial statements, has led sponsors to consider corporate finance implications as they manage their pension plan.
- The three main areas where the finances of a defined benefit pension plan can affect an organization's corporate financial statements are: the balance sheet, where the funded position is recognized; the income statement, where the pension expense is recognized; and the corporate cash flow statement, which reflects annual contributions to fund the plan.
- More and more over the last decade, sponsors have used a combination of plan design changes, asset allocation changes, and liability transfers to offset the impact of pension volatility on their corporate financial statements.

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Introduction

Decisions made in the management of a pension plan can directly affect a plan sponsor's current and future financial health. Over the past two decades, pension liabilities have more than doubled in size as a result of years of benefit accruals, declining interest rates, and an aging workforce.¹ Along with expanded disclosure requirements and the adoption of market-based accounting standards, this growth has led sponsors to consider the corporate finance implications of how they manage their pension plan.² Increasingly, decisions regarding plan design, asset allocation, and liability transfers are being made based on their expected impact on corporate financial statements.

The term *corporate finance* refers to the framework by which companies make long- and short-term decisions to maximize shareholder value. One key tenet of corporate finance is that organizations should take risk in their primary areas of expertise, where they believe they will be rewarded because they have a business advantage. Another is that organizations should reduce or hedge risks from ancillary operations, including areas like the management of pension investments or foreign exchange rates. In this spirit, many pension sponsors have adopted a "first do no harm" approach, whereby they manage the pension plan to minimize any potential negative impact on corporate financial statements.

From a corporate finance perspective, a pension plan's financial results must be viewed in the context of the plan sponsor's overall financial position. Key measures that a sponsor should consider include the size of the plan relative to the size of the company (liability as a percentage of market capitalization), the pension plan's impact on the balance sheet (annual change in the plan's surplus or deficit), income statement (pension expense as a percentage of net income), and cash flow statement (required contributions as a percentage of free cash flow). In addition, unfunded pension liability is considered a debt of the sponsor and is often added to other forms of debt when calculating corporate debt ratios.

Major trends that have affected U.S. pension plans over the past decade include the closing/freezing of plans, the adoption of liability-driven investing (including asset allocation glide paths), and the transfer of liability to individual participants or insurance companies. The common thread across these three trends is that they all reflect plan sponsors' efforts to reduce or offset the risk placed on their finances by the pension plan.

In the next three sections, we will take an in-depth look at how pension risk can affect a company's balance sheet, income statement, and cash flow statement. Finally, we will analyze how the trends in U.S. pension plans described earlier have affected corporate financial statements.

Balance sheet risk

Under both U.S. and international accounting standards, a plan sponsor must disclose the pension plan's funded position, on a marked-to-market basis, as part of the company's overall corporate balance sheet.³ (The amount disclosed is considered an asset of the company if the plan is overfunded; it is considered a liability of the company if the plan is underfunded.) Because the plan's funded position flows directly to the corporate balance sheet, any unexpected change in funded position will cause balance sheet volatility. Sponsors frequently consider using one—or both—of two levers to limit the influence of the pension plan on the balance sheet: asset allocation, and directly reducing the size of the pension plan (typically via a plan freeze or liability transfer).

¹ The total pension liability for corporations in the S&P 500 has increased from \$1.0 billion in 2002 to nearly \$2.5 billion at the end of 2020, according to a FactSet compilation of annual Form 10-K financial filings with the SEC by U.S. corporations.

² International and U.S. accounting standards mandate that companies report both the current market value of pension assets and the value of pension liability on their annual financial statements.

³ Note that this paper is written from the perspective of a plan sponsor with a pension plan that is governed by U.S. private-sector accounting standards and minimum funding regulations. We address these regulations at a high level, rather than explain them in detail, as our focus is on the relationship between the pension plan and the financial statements of its sponsor.

Reducing balance sheet risk through asset allocation

The impact of the pension plan's funded position on the corporate balance sheet is an asset-liability risk; that is, it is a risk directly related to how the plan's assets and liabilities respond to changes in financial markets. Because pension obligations are payable over a long period of time and are valued using current market yields on corporate bonds, pension liability values are considered to have the investment qualities of a long-duration corporate bond. In other words, the pension liability can be thought of as a negative investment, or a short position, in long-duration corporate bonds. All else being equal, if corporate bond yields rise, liability values will fall, improving the company's balance sheet position. Conversely, if yields fall, liability values will rise, hurting the balance sheet position. In effect, then, the pension is a bet that corporate bond yields will rise.

A sponsor can seek to mitigate balance sheet risk through asset allocation by investing in a bond portfolio with interest-rate and credit-spread sensitivity designed to offset their liability risk. This is frequently called a liability-driven investment strategy.

Figure 1 presents the potential risk management benefits of implementing a partial or full liability-driven investment strategy on a hypothetical 80 percent funded plan of typical size, with a 1:10 liability/market-capitalization ratio.

Figure 1. Estimated impact of a down market on a corporation's balance sheet under different allocation approaches

\$ in millions

	Prior to down market	After down market, by allocation approach		
		Total return	Partial liability- driven	Full liability- driven
Pension assets	\$800	\$ 771	\$ 826	\$ 904
Pension liabilities	1,000	1,120	1,120	1,120
Unfunded liability	200	349	294	216
Balance sheet impact	—	149	94	16
Market capitalization	10,000	9,000	9,000	9,000
Unfunded liability as a percentage of market capitalization	2.0%	3.9%	3.3%	2.4%
Balance sheet impact as a percentage of market capitalization	—	1.7%	1.0%	0.2%

Notes: Calculations in this table are based on hypothetical plan assumptions for a plan that is \$1 billion in size and funded at 80%. The down market scenario is a 10% decline in the equity market and a 1% decrease in interest rates. The total return approach is a portfolio with 60% global equities and 40% core fixed income. The partial liability-driven approach is a portfolio with 60% in global equities and 40% long-duration fixed income, with duration equal to the duration of the pension liabilities. The full liability-driven approach is a portfolio with 20% global equities and 80% long-duration fixed income, such that the plan is 100% hedged to interest rate risk.

Source: Vanguard.

Reducing balance sheet risk by reducing the size of the pension plan

A smaller plan will have less impact on a sponsor’s financial statements than a larger plan will. A sponsor has two primary ways to immediately reduce the size of the pension plan: a plan freeze or a liability transfer. Sponsors can use one method, or both. In many cases, freezing the plan immediately reduces the liability, as future salary increases will no longer increase the benefit paid out to any participant.⁴ Under U.S. accounting standards, the plan’s liability is reduced from the projected benefit obligation to the accumulated benefit obligation.

Liability transfers can also have an immediate (and sometimes dramatic) effect on the size of a pension plan, as shown in **Figure 2**. In a liability transfer, a sponsor reduces the plan’s size by paying lump-sum benefits to terminated vested participants or purchasing annuities for retired participants through an insurance company. Figure 2 shows a plan that does both, which is commonly the case.

To sum up: The larger the size of the plan relative to that of the corporation, the more the sponsor will be motivated to take action to limit the plan’s impact on corporate financial statements.

Key balance sheet risk measures and factors that are frequently considered from a corporate finance perspective include:

- Liability relative to size of the company (liability/market capitalization).
- Unfunded liability relative to size of the company (unfunded liability/market capitalization).
- Value at Risk (VaR) of the funded position relative to the size of the company (VaR/market capitalization).⁵
- The impact of corporate debt ratios on company finances when an unfunded pension plan is considered debt.

Figure 2. A liability transfer can reduce a pension plan’s size relative to the corporation

\$ in millions

	Before liability transfer	Amount of liability transferred	After liability transfer
Active liability	\$350	\$0	\$350
Terminated vested liability	150	75	75
Retiree liability	500	425	75
Total plan liability	1,000	500	500
Company’s market capitalization	10,000	—	10,000
Liability as a percentage of market capitalization	10%	—	5%

Notes: Calculations in this table are based on hypothetical plan assumptions for a plan that is \$1 billion in size and funded at 80%. The down market scenario is a 10% decline in the equity market and a 1% decrease in interest rates.

Source: Vanguard.

⁴ Both a plan freeze, which eliminates annual benefit accruals, and a plan closure, which reduces annual benefit accruals, will cause a plan to be smaller in the future than if it had remained open to new participants. Freezing or closing a plan will decrease the future size of the plan and therefore reduce its impact on the corporate financial statements. These changes, however, can accumulate slowly and therefore may take time to be realized.

⁵ VaR can be thought of as the 95th-percentile impact on funded status based on a set of capital market assumptions that stress tests the value of both assets and liabilities.

Income statement risk

A crucial part of pension accounting is the calculation of pension expense, a measure of the annual financial “cost” of operating a pension plan.⁶ A company’s annual pension expense directly offsets a corporation’s income from other sources, including its primary business. If pension expense is a meaningful percentage of overall income, then annual changes in pension expense could be a meaningful contributor to earnings volatility. In the U.S., the calculation of pension expense does allow for some “smoothing” or delayed recognition of various plan experience, and this smoothing dampens much of the volatility that would otherwise be present.⁷

The ability to smooth components of pension expense may seem like a good thing for a corporation looking to present stable earnings results—but smoothing often masks the risks a company is taking with respect to their pension plan, and it may even cause them to take more risk than they realize. For this reason, many financial analysts are trained to adjust pension expense to remove this smoothing and therefore represent the expense in a more “economic” or market-based form.⁸ The main ways they do this is by removing expected return on assets and replacing it with actual return on assets and

recognizing demographic and other economic gains and losses as they occur.⁹ There is no official name for this version of pension expense, so we will refer to it as analyst-adjusted pension expense. We suggest that sponsors follow this lead and analyze pension expense using both the standard calculation as well as the common analyst adjustments.

In Figure 3, we look at differences in how standard pension expense and three types of analyst-adjusted pension expense affect a company’s income statement in a down market scenario. In each case, we compare the pension expense, on a percentage basis, with a company’s income prior to the reflection of its pension expense, to find what percentage of income is used to “pay for” the annual pension expense. As the figure shows, the analyst-adjusted pension expense is much higher than the standard pension expense. This is because the impact of the market downturn is recognized in the year it occurs, rather than over a period of years. However, the impact on analyst-adjusted pension expense from a market downturn could be limited through asset allocation, specifically a liability-driven investing approach. As discussed earlier in the section on balance sheet risk, a liability-driven investment strategy will offset increases in the liability linked to falling interest rates by increasing asset values.

Figure 3. Estimated impact of a down market on a corporation’s income statement under different allocation approaches

\$ in millions

	Standard accounting	Analyst-adjusted accounting method		
		Total return allocation	Partial liability-driven allocation	Full liability-driven allocation
Service cost	\$24	\$28	\$28	\$28
Interest cost	30	22	22	22
Return on plan assets	(48)	29	(26)	(104)
Losses recognized during the year	15	120	120	120
Total pension expense	21	199	145	66
Corporate income	750	750	750	750
Corporate income (less pension expense)	771	949	895	816
Pension expense as a percentage of net income	3%	21%	16%	8%

Notes: Calculations in this table are based on hypothetical plan assumptions for a plan that is \$1 billion in size and funded at 80%. The down market scenario is a 10% decline in the equity market and a 1% decrease in interest rates. The total return approach is a portfolio with 60% global equities and 40% core fixed income. The partial liability-driven investing approach is a portfolio with 60% in global equities and 40% long-duration fixed income, with duration equal to the duration of the pension liabilities. The full liability-driven investing approach is a portfolio with 20% global equities and 80% long-duration fixed income, such that the plan is 100% hedged to interest rate risk.

Source: Vanguard.

⁶ The typical formula for pension expense is: service cost (value annual benefit accruals) + interest cost (financing cost of plan liabilities) – *expected* return on plan assets +/- delayed recognition of annual gains and losses.

⁷ Two common allowances for the smoothing of pension expense calculations in the U.S. are the use of expected, rather than actual, return on plan assets and the delayed recognition of annual assumption gains and losses.

⁸ See Moody’s Investor Service (2016).

⁹ This analyst-adjusted or “economic” version of pension expense would be equal to the annual changes in the plan’s funded position, not including plan contributions.

As with balance sheet risk, managing the pension plan's risk with an eye to the income statement would require having the sponsor compare the pension expense to a corporate measure such as annual corporate income. If the results show that the pension expense has the largest impact on the company's income statement, the sponsor may want to limit that impact through asset allocation that is liability-driven.

Whether allowing for smoothing or using the analyst-adjusted approach when calculating pension expense, a corporate finance approach to pension plan management attempts to limit:

- The size of pension expense relative to the remainder of the corporation's annual income;
- The annual volatility of pension expense to avoid earnings surprises; and
- The correlation of pension expense to other items within the corporate earnings statement.

Cash flow risk

Plan sponsors commit to fund the benefits that they promise to participants of the pension plan; in fact, U.S. employee benefits law requires pension benefits to be "pre-funded" (i.e., benefits are primarily funded as they are earned and held in trust until payable). Overall funding comes from a combination of cash contributions and investment earnings on those contributions. In the U.S., annual minimum required contributions are based on benefits earned during the year plus an amortization of any unfunded liability, with the goal of becoming fully funded over a period determined by regulators. U.S. funding regulations have become quite lenient, and they have the benefit of reducing contributions to nearly zero in the short term. Corporations can thus retain cash within the organization to use for their main operating business or to invest in the future in the form of research and development.¹⁰ However, the reduced funding requirement also leaves the plan with a lower asset value, making the plan less well funded and subject to higher annual PBGC (Pension Benefit Guaranty Corporation) premiums.¹¹ Annual asset growth is also reduced as investment returns are being applied to a lower asset base.

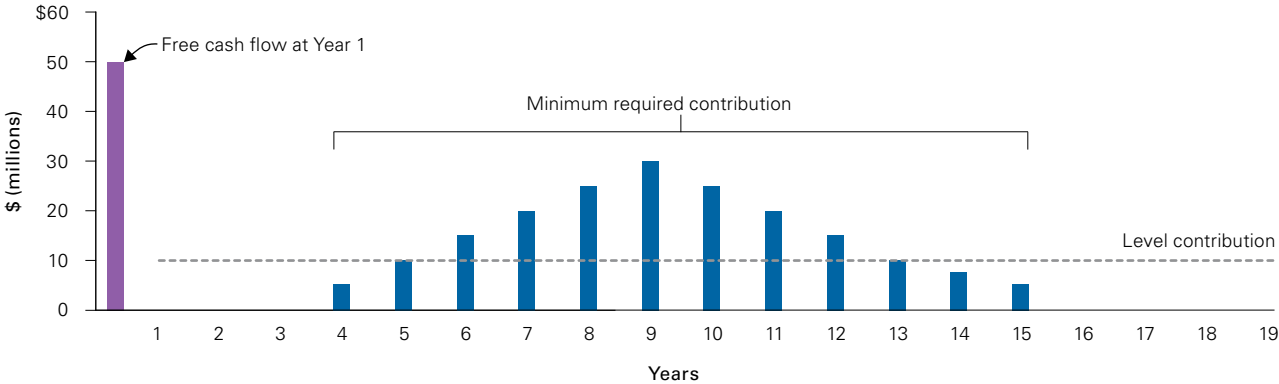
¹⁰ A series of amendments to the minimum required funding regulations, passed between 2012 and 2021, allow for qualified U.S. pension plans to calculate their unfunded liability using discount rates much higher than current market rates, leading to a smaller unfunded liability, and to amortize that unfunded liability over a period of 15 years.

¹¹ The Pension Benefit Guaranty Corporation is a quasi-governmental organization that insures U.S. pension plans through the collection of annual premiums. Premium rates are based on both number of plan participants (the flat-rate premium) and the amount of unfunded vested benefits (the variable-rate premium), with the value of unfunded vested benefits calculated at interest rates closer to current market levels. The result is a higher liability than that used in the minimum required funding calculation.

Figure 4 shows the differences in the yearly contribution amounts for a backloaded (required minimum contribution) policy versus a level contribution policy across time. The blue bars show contributions that are backloaded in a similar way as what is allowable in the U.S. as a minimum required contribution. Because liabilities can be smoothed and shortfalls amortized over many years, the contributions tend to start low (near zero in this case), hit a peak midway through the period, and then wind down as the plan approaches full funding. In the figure, the leftmost bar shows the free cash flow for the sponsor in Year 1. (Free cash flow is a measure of a corporation’s annual operating profits and represents the cash a company generates after removing costs.)

A sponsor who follows a minimum required contribution policy should be aware that contributions would start off at 0% of the corporation’s free cash flow but then accelerate to nearly 60% of free cash flow. Sponsors may find it advisable to create a level contribution policy (shown as a dotted line in the figure). Because these contributions are level relative to corporate cash flow, they fit better into a corporation’s budgeting process and will lead to fewer surprises or draws of cash diverted from other projects.

Figure 4. Required minimum contributions versus level contributions—year by year



Notes: Figure is for illustrative purposes and shows yearly pension contributions under a hypothetical minimum required contribution policy, and a hypothetical level contribution policy. Note that the level policy is designed to result in the same asset value at the end of the period as that produced by the minimum required distribution policy.
 Source: Vanguard.

How have corporate finance considerations influenced the management of U.S. pension plans?

Changes in plan design

The biggest long-term trend in employee benefits has been the shift from providing participants with a defined benefit pension plan to providing a defined contribution plan. This means that more pension plans have either closed to new participants or frozen to all future benefit accruals.¹² These plan sponsor decisions are generally viewed as being largely driven by corporate finance considerations:

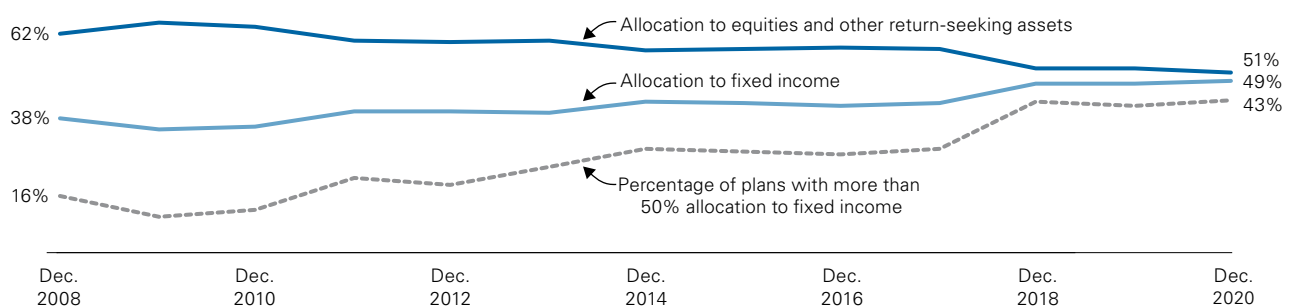
- **Balance sheet.** The freezing of a pension plan immediately reduces the plan liability, as the impact of salary projections is no longer included in the calculation of the liability. Moreover, eliminating or reducing annual service cost limits the growth rate of a pension liability. Limiting the growth of a pension liability means that liability in the future will be smaller than it would be otherwise—and therefore will have less of an impact on corporate financial statements.
- **Income statement.** Closing or freezing the pension plan reduces annual service cost toward zero, either gradually (in the case of a closed pension plan) or immediately (in the case of a frozen pension plan). As service cost is a component of pension expense, closing or freezing a pension plan will reduce annual pension expense and reduce its impact on corporate earnings.
- **Cash flow.** As well as being part of the pension expense calculation, service cost is also a component of the annual required contribution.¹³ Thus, because closing or freezing a pension plan reduces service cost, the sponsor’s annual required contributions are also reduced—along with their impact on the company’s cash flow.

Changes in asset allocation

Many plan sponsors have managed the risks of their pension plan on their financial statements by utilizing a liability-driven investment approach. This approach typically reduces the allocation to equities, to reduce market risk, and increases the allocation to and the duration of the fixed income portfolio, to reduce interest rate and credit spread risk. The shift from equities to fixed income has frequently been accomplished through the adoption of a glide-path investment strategy—a systematic approach to asset allocation that reduces the equity allocation and increases the fixed income allocation as funded status improves.

Figure 5 illustrates the change in asset allocation from 2008 to the end of 2020 for pension plans managed by companies in the S&P 500. The average allocation of plan portfolios to equities and other return-seeking assets has decreased from 62% to 51%, while the average allocation to fixed income has increased from 38% to 49%. Further, 43% of pension plans have allocated more than half their assets to fixed income, an increase from 16% of plans at the end of 2008. These changes have resulted in reduced asset-liability risk for the pension plan, which in turn reduces both the volatility of funded status and the risk on the corporate balance sheet and income statement.

Figure 5. Corporate pension asset allocation changes



Note: Calculations are for all S&P 500 companies that have pension plans.

Sources: Vanguard calculations, using data from FactSet.

¹² A recent survey by Vanguard (2019) shows that nearly two-thirds of qualified U.S. pension plans are either closed to new participants or frozen to all future benefit accruals—up from only 35% in 2010.

¹³ U.S. minimum contribution requirements use the term *normal cost* for the value of annual benefit accruals, but the concept is analogous to the term *service cost*, which is used in the calculation of pension expense in U.S. accounting standards.

Changes in liability management

Over the last decade, pension plan sponsors have taken two approaches to directly reduce the size of the plan and therefore its impact on the corporate financial statements. The first method is the voluntary lump-sum program, whereby terminated vested participants are offered a one-time “lump sum” in lieu of a future annuity.¹⁴ The second is the purchasing of annuities from an insurance company, typically for retired participants.¹⁵

Figure 6 shows the 10 largest annuity purchases since 2012. At a combined value of nearly \$69 billion, these purchases represent one-third of the total annuity purchase market during that time. The table shows two key points: first, that these sponsors were able to significantly reduce the size of their liability, and second, that the sponsors most drawn to this strategy are the ones whose pension plans are very large relative to the size of the corporation. These findings show that the pension annuitization market is largely driven by a corporate finance mindset.

Figure 6. Top 10 annuity purchase transactions from U.S. corporate pension plans (2012–2021)

Corporation (transaction year or years)	Liability annuitized (\$ in billions)	Liability annuitized as a percentage of total liability	Market capitalization (\$ in billions)	Liability as a percentage of market capitalization
Liability versus market capitalization is greater than the 95th-percentile value for all U.S. public corporations				
General Motors (2012)	\$29.0	22%	\$61.3	161%
International Paper (2017–18)	2.8	20%	21.9	63%
Lockheed Martin (2019–21)	5.1	11%	74.1	60%
WestRock (2016)	2.5	36%	11.6	60%
Motorola Solutions (2014)	3.1	33%	17.2	54%
FedEx (2018)	6.0	20%	66.8	45%
Liability versus market capitalization is greater than the 75th-percentile value for all U.S. public corporations				
Verizon Communications (2012)	7.5	25%	113.7	27%
Liability versus market capitalization is greater than the median value for all U.S. public corporations				
Baxter International (2019)	2.4	43%	33.8	17%
Kimberly Clark (2015)	2.5	36%	42.2	16%
JCPenney (2021)	2.8	100%	—	—

Notes: Data for 2021 are as of August 31, 2021. JCPenney was in bankruptcy at the time of the annuitization; therefore, the value of the market capitalization was not available.

Sources: Vanguard calculations, based on data from the Pension & Investments Research Center’s Pension Risk Transfer database.

¹⁴ A study by the PBGC found that between 2015 and 2018, nearly 2,300 pension plans conducted a voluntary lump-sum program, with the effect of removing over 1.5 million participants from their pension plans (Pension Benefit Guaranty Corporation, 2020).

¹⁵ The size of the annual annuitization market had grown from approximately \$1 billion per year prior to 2012 to an average of \$25 billion per year during the period from 2017 to 2020 (LIMRA, 2021).

Conclusion

Closing or freezing a pension plan slows the growth rate of plan liabilities; adopting liability-driven investment strategies and increasing a plan's fixed income allocation helps sponsors better align their assets and liabilities and reduce funded status risk; and transferring a liability immediately reduces the size of a plan's liability. In the U.S. pension plan system, these three strategies have been used more and more over the last 15 years, as sponsors seek to manage how their plan affects their corporate financial statements.

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