Context Is Key: Choosing Physicals or Derivatives in Liability-Driven Investing

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Liability-driven investing (LDI) seeks to align risk exposures between investments and liabilities. Many pension plans that have adopted an LDI framework make use of interest rate derivatives to close any gaps in interest rate exposures between an asset portfolio lacking sufficient capital to hedge and the plan's liabilities. There's scarce difference, however, between a portfolio that extends its duration via derivatives and holds physical equities and one that holds long-duration physical bonds and achieves equity exposure via derivatives. In this paper we provide some insight as to why this is and how sponsors who internalize this logic can potentially gain advantages in their LDI endeavors.

Key takeaways

» Cash paired with derivatives can produce nearly identical results to physical assets for both bonds and equities.

» LDI strategies commonly use fixed income derivatives to offset liability interest rate risk.

» Replacing equities with equity derivatives and investing in physical bonds leads to a nearly equal outcome.

» Recognizing this relationship allows an investor to balance the state of their portfolio with market conditions to achieve more context-driven, efficient solutions.

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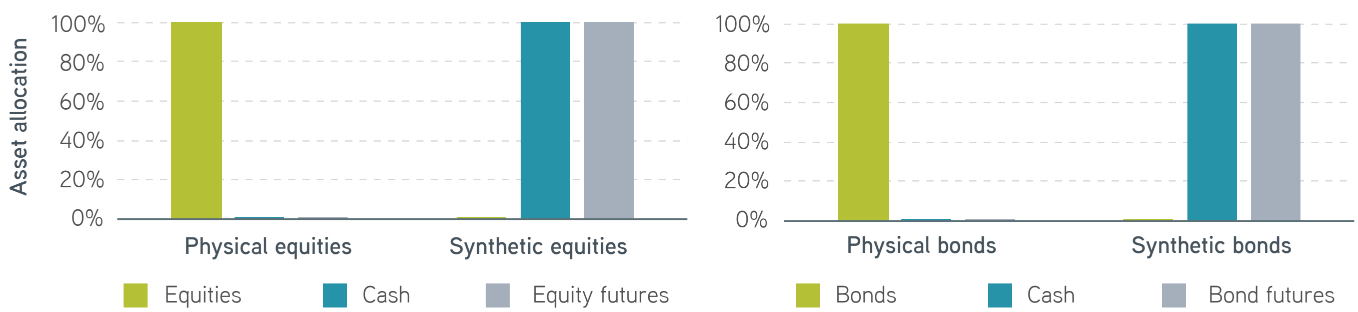
Different instruments, same outcomes

With both equity and fixed income derivatives, investors receive approximately the total return of the underlying asset minus a financing cost. When paired with a commensurate amount of cash, the return generated from the cash position may partially or wholly offset the financing cost of a fairly priced derivative. For example, as figure 1 illustrates, cash paired with equity derivatives will provide an outcome nearly identical to investing in physical equities. Similarly, cash paired with bond derivatives delivers an outcome nearly identical to investing in physical bonds.

Because of this characteristic, an investor should be relatively indifferent choosing between holding physical securities or holding cash plus derivatives, since they can deliver very similar outcomes. Accordingly, assuming a passive exposure to equities and a Treasury exposure for bonds for ease of discussion, physical and synthetic exposures can generate nearly identical returns, volatility, and duration.

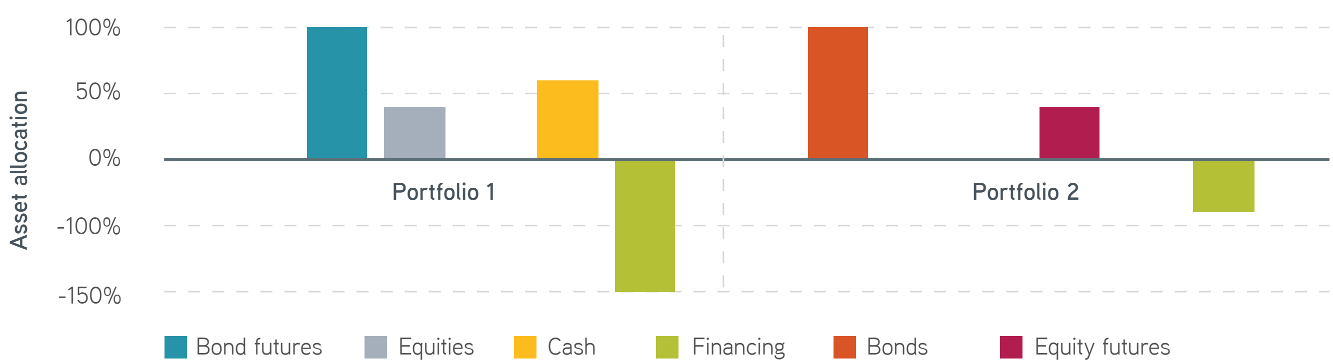
Consider the two portfolios depicted in figure 2. Both allocate 40% to equities and 100% to fixed income, and both use 40% leverage. Portfolio 1 is an extreme version of the classic LDI portfolio, in which bond derivatives make up the fixed income allocation or a significant portion thereof and equities are invested in traditional securities. Portfolio 2 flips the structure around and is decidedly less common. The equity allocation is now made up of derivatives, and the bond portfolio is invested in traditional physical securities. Although the structure of portfolio 2 is much less common and looks very different from portfolio 1, both can generate equivalent returns and have similar risk characteristics. Both portfolios can get the investor to the same end point, and neither is necessarily correct in all situations. However, having the flexibility to transition between the two portfolios and all points in between allows the investor to take advantage of market dynamics that are unavailable if only portfolio 1 is used.

FIGURE 1: PHYSICAL SECURITIES VS. CASH PLUS DERIVATIVES (EXAMPLE)



Source: Parametric, 12/31/2022. For illustrative purposes only. Not a recommendation to buy or sell any security.

FIGURE 2: BOND DERIVATIVES PLUS PHYSICAL EQUITIES VS. EQUITY DERIVATIVES PLUS PHYSICAL BONDS (EXAMPLE)



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Aligning choices with goals

Achieving a state of ambivalence between physical or derivative exposures allows plan sponsors to choose the implementation solution that best reckons with real-world cost considerations and liquidity barriers. By not locking the plan into one approach to achieving an exposure, the sponsor can choose the method that best achieves their investment goal for a total plan, balancing the state of their portfolio with current market conditions. Below we lay out examples of the dynamics that may come into play and how they can potentially lead to a different mix of physical or synthetic exposures to asset classes:

New cash. If a pension plan has a large cash position or is receiving a new cash infusion, it pays to examine whether a synthetic or physical exposure is the most cost-effective way to gain exposure, since in this case everything would be a one-sided transaction. However, if cash is already invested in other assets, there's plainly a higher barrier to switching from the current state due to the costs involved in liquidating, including foregone active returns and transition management expenses, on top of costs associated with repurchasing the exposure.

Fixed income market conditions. The universe of long corporate bonds is limited, and transaction costs can be high, whereas intermediate bonds have high issuance and maximum alpha opportunities. This may lead sponsors to consider a blend of intermediate bonds plus duration-extending derivatives. But long corporate bonds have a time-varying level of liquidity and associated transaction costs. During periods of high bid-ask spreads and limited supply of bonds to purchase, derivatives and swaps can be a cheaper and more efficient manner of gaining fixed income exposure. However, in times of high stress, sponsors can purchase such securities opportunistically from distressed sellers at advantageous prices.

Equity market conditions. Cash-based passive equity solutions are widely available for institutional investors at de minimis cost. This is a cost-effective way of gaining equity market exposure in normal times. For those wishing to use active equity strategies, these are typically available only by a cash investment. However, if a plan primarily holds passive equity solutions, it may face extended periods where synthetic exposure is cheaper on the derivatives market for certain benchmarks. In addition, an elevated supply of long corporate bonds suitable for hedging a plan's liabilities may come to market. Here it could make sense to make room in the portfolio by selling equities, buying bonds, and reestablishing equity exposure through derivatives.

The decision to use derivatives or cash securities in an LDI solution isn't one-size-fits-all. To the extent that plan sponsors can keep a clear mind and objectively assess the ability of different instruments to meet unique objectives, they'll be better positioned to exploit opportunities in the capital markets that may assist in achieving their goals.

Conclusion

The choice of the best way to gain asset class exposure is very context-driven, both from the situation of the plan (funding status, sponsor health, risk management capabilities) and from the ever-changing market dynamics in play from day to day (trading costs, market liquidity, roll costs). There's never one correct answer, and the answer may change through time. By being open to alternative methods of exposure management, plan sponsors will be able to pick the best combination of physicals and synthetics for their circumstances.

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