By **Roger D. Silk**

Evaluating the Risks

Challenges and opportunities resulting from the current low interest rate environment

Interest rates in the United States and in most developed countries are at or near their lowest levels in decades. These low interest rates create both challenges and opportunities for endowed organizations, such as public charities, private foundations (PFs) and charitable trusts, as well as individual donors to charity.

No one can confidently predict when, whether or by how much interest rates will rise in the future. But, the math shows that there's probably much more downside risk than upside potential for bonds and interest rate-sensitive assets, and portfolio decisionmakers should be familiar with key measures of interest rate risk.

Bonds

Books can and have been written about bonds. Here, I'll focus on one aspect: the interest rate risk/reward characteristics of a "risk-free"[1] 30-year bond, when the yield on the 30-year bond is 3 percent. My goal is to illustrate two important types of risk inherent in bonds at low interest rates.

These two risks are measured by two quantities called "duration" and "convexity." As interest rates rise, the market prices of bonds fall. Duration is a single number that attempts to summarize the sensitivity of a bond's price to a given change in interest rates.

For example, the duration of a 30-year Treasury bond, with a 3 percent coupon, priced at par (that is, $100 market price for each $100 of face value) is approximately 20.[2] The price of this bond would change by approximately $20 (out of $100) for each one percent change in rate. So, for example, a bond that trades at par when the interest rate is 3 percent, will drop in value by 20 percent if interest rates increase by 1 percent.

In actual practice, the fall in price is likely to be somewhat less because duration is a linear measure, and the underlying process is nonlinear. You actually already have an intuitive understanding of the last sentence, even if you think you didn't understand it.

The duration of 20 that we just invoked would imply that an increase in the interest rate from 3 percent to 8 percent would reduce the value of the bond to zero, because five times 20 is 100, and 100 minus 100 is zero.

But, that's not what happens. Bond prices aren't a linear function of interest rates. Duration gives a good estimate for the change in the price of a bond given a small change in interest rates, but the error gets larger as the change in interest rate increases.

For larger changes, we need the second measure, which is called "convexity." The duration of a given bond depends on the interest rate, among other factors. As the interest rate changes, so does the duration of the bond. Convexity is a measure of the change of the duration of a bond as the interest rate changes.[3] Before you dismiss convexity as a mere technical complexity, you need to know that some types of bonds may have negative convexity and that the investor who fails to understand negative convexity may get less than he's bargaining for.

Negative Convexity

With a non-callable, fixed-maturity bond like a Treasury bond, convexity is positive. That means that increases in interest rates don't hurt as much as duration alone would suggest.

But, the opposite is true for negative convexity bonds. A bond with negative convexity has the nasty habit of becoming a longer-term bond when interest rates are rising and a shorter-term bond when interest rates are

Roger D. Silk is chief executive officer of Sterling Foundation Management in Herndon, Va.

falling. Unfortunately, each of these characteristics is just what the investor doesn't want because they give the investor more duration when he wants less and less duration when he wants more.

You may never have heard of negative convexity by that name. But, you've probably heard of callable bonds and of mortgages and mortgage-backed-securities. Both of these classes of bonds tend to have negative convexity, making them very tricky for investors.

Negative convexity occurs because the bond investor (who's essentially the lender) is, in addition to lending money to the borrower, granting the borrower an option to pre-pay the loan. The lender must expect the borrower to act in his own financial interest. For example, when interest rates rise, the homeowner will tend to hold onto his now-below market mortgage. But, when interest rates fall, the homeowner will rush to refinance at the lower rate, paying off his higher rate mortgage. Corporations that have issued callable debt behave the same way.

Bonds, such as mortgage bonds and some corporate and municipal bonds, which appear to offer above-market interest rates given their maturity and credit quality, may have negative convexity.

As you evaluate your organization's need for income from its bond portfolio, make sure that someone on the team has a good understanding of duration and convexity.

Interest Rate Risk

With interest rates at multi-decade lows, economic prudence would seem to indicate more-than-usual attention to risk in the fixed-income portfolio for all bond-holding institutions. "Interest Rate Map," this page, provides a stylized map of the territory with respect to interest rate risk in a macro sense. Over about the last 70 years, rates on long-term Treasuries have ranged from about 2 percent to about 15 percent. "Interest Rate Map" shows the theoretical price of a 30-year Treasury with a 3 percent coupon at different levels of interest rates.

If the past is prologue, there's a lot more downside risk than upside potential in owning long-term bonds.

Reaching for Yield

When interest rates are low, there's a constant pressure to reach for yield, that is, to incur more risk to try to obtain a higher current yield from the bond portfolio. The most common ways of reaching for yield are to extend on the yield curve, which means taking more interest rate risk, and to purchase lower quality bonds, which means incurring more default risk. Most participants in the bond market understand these risks, at least in theory.

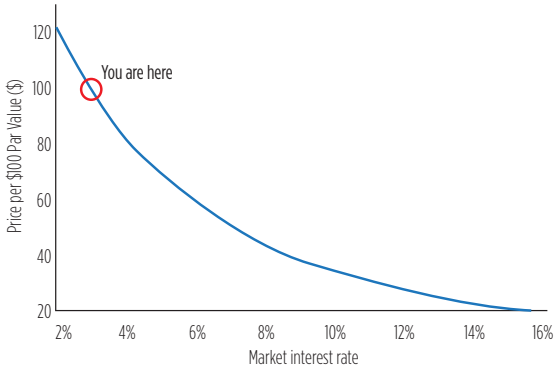
Endowment managers who are concerned that rates may rise should review their portfolios for duration, which is a direct measure of exposure to rising interest rates, and for negative convexity, which often flies under the radar, until securities perform far worse than expected.

Alternatives

With the dividend yield on the S&P 500 currently about 2 percent and the yield on investment-grade bond portfolios in the 3.5 percent to 4 percent range, it's difficult to reach the 5 percent payout required for PFs and donor advised funds (DAFs). According

Interest Rate Map

The prices of long-term Treasuries decrease as the yield gets higher



— *Sterling Foundation Management, LLC*

to Joyce Crivellari, a senior wealth strategist at UBS Financial Services in Houston, "Foundation leadership may need to adjust its approach to investment allocation and cash management to navigate the low interest rate waters."[4] In addition, many endowed organizations, such as universities, have found it difficult to maintain the payout from their endowments without invading capital. I believe that many public charities may be overlooking a hidden potential source of significantly higher returns on investment because it's so unconventional in a historical and accounting sense that it rarely even enters the endowment investment discussion.

The majority of public charities with endowments don't push their fundraising to the logical margin.

There are a number of unconventional investment alternatives, from hedge funds (watch out for unrelated business income tax) and private equity funds, to real estate, venture capital, commodities and managed futures, which may or may not make sense for any given endowment, trust or foundation. A discussion of these vehicles is beyond the scope of this article.

However, all public charities have open to them a unique investment opportunity, which in all but the superbly managed can easily have a return greatly in excess of 5 percent of invested capital.

What's this hidden investment opportunity?

Additional investment in fundraising.

In my experience, the majority of public charities with endowments don't push their fundraising to the logical margin.

There are deep-seated institutional, historical and even legal rules why; nevertheless, the economics is the same.

It's common for a non-profit board to seek to limit fundraising expenses as much as possible. Because, by their nature, nonprofits don't have a conventional profit and loss statement, cultural norms have developed that seek to define a financially well-run nonprofit, such as "Fundraising expenses should not exceed 35%"[5] or the federal government's limit of 25 percent adopted for its "Combined Federal Campaign."

The Association of Fundraising Professionals reports that the average U.S. charity spends somewhere in the range of 20 percent to 28 percent of each dollar raised on fundraising. Let's assume that 25 percent is the average cost of fundraising for U.S. charities. That means that for every dollar spent on fundraising, the charity receives back $4. But from an economic perspective, $1 out that causes $4 to come in is a return of 300 percent!

Now, of course, the 25 percent cost number is average cost, and good economic decisions are made at the margin. So, just because the average return on fundraising expense is 300 percent, it doesn't necessarily follow that the marginal return will be 300 percent. But, it's quite likely that an organization enjoying a 300 percent return on fundraising expense (investment) may earn a return on additional expense significantly in excess of the returns that can be expected from the portfolio.

PFs and DAFs

PFs and DAFs must adhere to the requirement to distribute 5 percent of their assets each year. To avoid dipping into principal, such organizations must achieve total returns of at least 5 percent on assets each year.

Suppose you're the decisionmaker for a PF or a DAF account, and you're concerned that future investment returns may not reach 5 percent annually. What choices do you have? Broadly speaking, you have three categories of action. You can: (1) take your (organization's) chances with the stock and bond markets; (2) pursue alternative strategies, as alluded to above; or (3) optimally husband the organization's funds and, if necessary, seek extra funds.

Optimally Husband Funds

Choice 1 is simple, if risky. Choice 2 is complex, possibly risky and beyond the scope of this article. Here's an outline of Choice 3.

Distribution requirement. The 5 percent distribution requirement for PFs is computed for a given year by averaging the month-end balances during the previous year. A typical PF may simply wait until the year, say 2012, is completed, calculate the required distribution for 2013 based on 2012 monthly values and distribute the required amount sometime before the end of 2013.

The risk in this approach is that if the market drops sharply during 2013, before the cash is raised for the required distributions, significantly more than 5 percent may be required.

A simplified example illustrates this point. Consider a PF that owns 1,000 shares of "the market." Assume that during 2012, the average value of these shares was $1,000, for a total value of $1 million. The required distribution for 2013 would be $50,000.

Further, assume that the PF habitually waits to the end of the calendar year to make distributions and to raise cash for such distributions. And, assume that by the time the decision is made, the market is down 20 percent from the end of 2012. In the above example, each share would now be worth $800. To raise the required $50,000, the PF will have to sell 62.5 shares, which amounts to 6.25 percent of the now-current value of the PF.

There are two ways to avoid this outcome that may be worth considering. One is to carefully manage the PF's cash, so that it always equals the accrued distribution. The easiest way to do so would be to raise cash equal to 5/12ths of 1 percent as close to the end of each month as possible each year. That way, the PF would always have cash for the following year's distribution at almost exactly 5 percent of the foundation's average assets. This approach will likely appeal to PFs governed by board members who aren't themselves major donors to the PF.

The second way may appeal to PFs governed by their major donor(s). This method is to remain fully invested during the year. Then, at some time during the subsequent year, if the market is up at any point over the previous average value, raise the required cash.

If the market never rises above the previous year's average, the donor can instead contribute the prior year's required donation. This approach would have to be considered in light of the donor's typical giving habits and his personal tax situation.

Charitable split-interest trusts. A typical charitable split-interest trust (charitable remainder trust (CRT) or charitable lead trust (CLT)) requires a fixed annual

distribution, usually a minimum of 5 percent. Trustees may wish to adopt the cash management approach described above, although it would have to be matched to the trust's distribution requirement. Trustees tempted to chase yield should keep in mind that they represent the interests not only of the income beneficiary, but also of the remainder beneficiary. They have a fiduciary obligation to not favor one over the other.

Sell Out and Spend Down?

PFs. Some organizations, especially PFs and DAFs, may find their assets at historically high levels because the stock and bond markets are high, corresponding to the low interest rates and low expected future returns.

For some older donors, it may make sense to consider taking advantage of these high relative valuations to raise a lot of cash and embark on a much larger than 5 percent giving campaign.

Public charities. Most endowed public charities don't have the option of spending down, but as discussed above, instead may wish to consider allocating a small amount of endowment funds or cash flow to additional fundraising.

CRTs

Most CRTs have little or no flexibility in distributions, nor, because of the dual class of beneficiaries, can they spend themselves down. Usually, the donor won't wish to contribute more funds. However, CRT income beneficiaries have a unique alternative: They may be able to directly cash in on low interest rates by selling their CRT income stream.[6]

Low interest rates mean high bond prices. A CRT income stream is similar in some important ways to the cash flows of a bond; therefore, everything else being equal, low interest rates mean that the value of a CRT income stream is higher than it would be if interest rates were higher.

New Planning Opportunities

Low interest rates mean high bond values, price/earning ratios and stock prices. Investors concerned that future returns from stocks and/or bonds may be low or negative should take advantage of the current high prices by making charitable gifts. Donors comfortable with the idea should make outright gifts to their favorite charities now, taking advantage of the high prices to contribute low-basis, highly appreciated property.

Donors who believe prices are high, but who aren't prepared to relinquish full control of their property, may, nevertheless, want to take advantage of the high valuations to receive tax deductions and consider contributing highly appreciated property to a PF or DAF.

Finally, high-net-worth donors may wish to take advantage of the current low interest rates by creating CLTs, particularly charitable lead annuity trusts (CLATs). The same bond math that makes it risky to own 30-year bonds creates opportunity for a donor willing to fund a CLAT now. If rates rise, the CLAT payment will remain fixed at the current low rates and the CLAT will accrue the higher future earnings to the ultimate benefit of the donor's heirs. "CLTs can be most effective when interest rates are low and growth of assets is healthy. This type of trust can allow donors to effectively achieve both philanthropic goals as well as wealth transfer planning goals," according to Crivellari.[7]

Endnotes

1. Economists typically use the term "risk-free" to refer to the common view that the debt of a sovereign nation, denominated in its own paper currency, is free from the risk of money default. For example, this view implies that there's zero risk that the U. S. Treasury will fail to pay in a timely manner any principal or interest payment. For a comprehensive treatment of the history of government defaults, *see* Carmen M. Reinhart and Kenneth Rogoff, *This Time is Different: Eight Centuries of Financial Folly*, Princeton University Press, 2009.
2. "Approximately" because there's more than one way to calculate a bond's duration. The differences are meaningful to bond arbitrageurs and perhaps some bond traders, but, in my view, aren't significant in the context of endowment investing. The reader wishing a detailed discussion of the math is referred to Frank Fabozzi's 1500 page tome, *Handbook of Fixed Income Securities*, McGraw Hill. Any edition should be fine.
3. The mathematically inclined reader will note that duration is the first derivative of price with respect to the interest rate, and convexity is the second derivative of price with respect to the interest rate.
4. Phone conversation between Roger Silk and Joyce Crivellari on Sept. 4. 2103.
5. *Tampa Bay Times*, "Fifty Worst Charities" (June 2013).
6. *See, e.g.*, "Alternatives to CRT Terminations," *http://wealthmanagement.com/financial-planning/alternatives-crt-terminations; see also* the *Advisor's Guide to the Sale of CRT Income Interests*, available at *SterlingFoundations.com.*
7. *Supra* note 4.