Investor Education Series

Understanding Duration

Allianz Global Investors

Most bond investors know that changes in interest rates can affect the value of their fixed-income holdings—when rates rise, bond prices fall and vice versa. Yet many do not realize there is an investment tool that can be used to measure the potential price volatility of a given bond or bond fund—a measure called "duration."

What about average maturity?

In the past, bond investors tended to focus their interest rate risk/reward analysis on a bond's maturity, or the number of years until a bond pays back its principal. But using maturity alone in this way is flawed. Yes, longer maturity bonds tend to be more volatile than shorter maturity ones, but a fund's average maturity by itself is not an accurate proxy for the NAV (net asset value) or price volatility of a particular portfolio. In order to more accurately measure volatility, an investor must consider more than just the time at which principal alone is due to be repaid.

How investors use duration

A better measurement of a bond fund's interest rate risk is "duration." Duration is a theoretical measurement developed by Professor Frederic Macauley back in 1938. Specifically, the investment tool measures the sensitivity of a particular bond or bond fund to changes in interest rates.

While the actual mathematical calculation of duration is complex, the use of it is straightforward. To measure the potential change in a bond fund's NAV for a given change in interest rates, simply multiply the change in rates (expressed in percentage points) by the fund's duration (expressed in years). For example, if interest rates rise by 1 percentage point and the duration of a fund is 4 years, you could expect the fund's NAV to fall 4%. On the other hand, if interest rates fell by 1 percentage point and the duration was 2 years, the fund's NAV could be expected to rise 2%.

As this example shows, a longer duration means more price volatility while a shorter duration means less volatility. Therefore, investors who are very risk-averse and don't want their principal value to fluctuate much, should look for a bond fund with a very short duration. Investors who are more comfortable with these fluctuations, or who are confident that the interest rate outlook is bullish, should look for a longer duration.

Bonds with longer durations experience greater price fluctuation (Initial value of $1,000)

ONE PERCENTAGE POINT **RISE** IN RATES

Duration	Resulting Price	% Change
1 Year	$990	–1%
5 Years	$950	–5%
10 Years	$900	–10%

The duration figures quoted do not relate to any specific Allianz Global Investors product.

ONE PERCENTAGE POINT **FALL** IN RATES

Duration	Resulting Price	% Change
1 Year	$1,010	1%
5 Years	$1,050	5%
10 Years	$1,100	10%

The duration figures quoted do not relate to any specific Allianz Global Investors product.

How managers use duration

Until recently, duration has been largely ignored by investors and many portfolio managers. One major exception to this, however, has been PIMCO, which has long used this tool in building its client portfolios and in managing risk.

As a portfolio manager's interest rate outlook changes, he or she can adjust the portfolio's average duration (by adjusting the holdings in the portfolio) to coincide with the forecast. So, if a manager's analysis indicates that interest rates will be increasing, he or she could shorten the portfolio's average duration to minimize the negative effect on prices. Conversely, if the manager expects interest rates to fall, he or she could lengthen the average duration of the portfolio in order to get the maximum benefit from the change.

The limitations of duration

While it can be an extremely useful tool, the concept of duration is not perfect. One important limitation to keep in mind is that duration does not tell you anything about the credit quality of a bond or bond fund. And the issue of credit quality can be particularly important with lower quality securities (such as high-yield bonds), as these securities tend to react as much, if not more, to investor concerns about the stability of the issuing company as they do to changes in interest rates. Another limitation to using duration when evaluating a bond fund is that a fund's average duration changes as its portfolio changes. So, the duration at the time of purchase may not be at all accurate after the fund's holdings have been adjusted. Concerned investors should regularly check their bond funds' average duration to avoid surprises, or invest in funds that attempt to maintain a set average duration range.

Please ask your financial advisor for more information about the Allianz Global Investors products that offer investment opportunities related to this article.

Investors should consider the investment objectives, risks, charges and expenses of any mutual fund carefully before investing. This and other information is contained in the fund's prospectus, which may be obtained by contacting your financial advisor. Please read the prospectus carefully before you invest.

Past performance is no guarantee of future results. There is no guarantee that these investment strategies will work under all market conditions and each investor should evaluate their ability to invest for a long-term especially during periods of downturn in the market. The credit quality of the investment in the portfolio does not apply to the stability or safety of the fund. Managed accounts are available through Allianz Global Investors Managed Accounts LLC, 1345 Avenue of the Americas, New York, NY 10105-4800. The funds are distributed by Allianz Global Investors Distributors LLC, 1345 Avenue of the Americas, New York, NY 10105-4800, www.allianzinvestors.com. For information about either product, contact your financial advisor.

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