Risk-Adjusted Return Analysis for Bonds

As bank managers, we are always evaluating which bonds will be the best fit for our banks investment portfolio. What is the best metric to consider when evaluating a bond? Many would say yield, but it is important to not only consider the yield on a bond but also determine what risks are embedded in the yield. Considering and quantifying these different risks allows the investor to estimate a risk-adjusted return, which is a good tool for measuring relative value in addition to the yield.

The four risk factors embedded in the yield on a bond are 1) duration risk, 2) liquidity risk, 3) credit risk and 4) convexity or option risk. I will discuss these one at a time.

Duration is a measure of the bonds interest rate risk. All bonds should be measured against the duration-matched point on the US treasury yield curve, the risk-free benchmark for all bond valuations. The duration effectively represents the average change in the price of the bond for a parallel shift in interest rates up and down 100 basis points. Since the US treasury yield curve is usually upward sloping, comparing a longer maturity bond yield to the short-end of the curve instead of the duration-matched point on the curve would overstate the spread to treasury for the bond and always push the investor to buy longer bonds. The objective is to match the bond to the point on the yield curve that would move in price most similar to the bond being evaluated for changes in interest rates.

Subtracting the duration-matched treasury yield from the bond yield equals the gross spread to treasury. The gross spread can then be adjusted for liquidity, credit and convexity risks to arrive at the risk-adjusted return.

Liquidity risk represents the risk should an investor ever want or need to sell a bond. The most liquid bonds are US treasuries, which can always be sold and have a very tight bid/ask spread. Municipal bonds, agency debt and mortgage-backed securities all have good liquidity, although not quite as good as treasuries. In addition, some bonds have better liquidity than others. The more unusual or unique the bond is, the larger the bid/ask spread will be. The bid/ask spread is the price difference between the bid and offer price in the market. The liquidity cost in yield can be estimated to be the yield difference implied by the bid price and the ask price. Keep in mind that bid/ask spreads can widen in times of market stress so the less liquid the bond is, the more difficult and costly it will be to sell. The liquidity risk can also be represented by funding premiums in the wholesale funding market. As with bid/ask spreads, wholesale funding premiums can widen in times of market stress and funding options can become harder to find.

Credit risk is the risk that the bond will not pay due to credit problems with the issuer. The bond may actually default or may just fall in value due to perceived credit issues with the bond that make the market concerned about its ability to pay in the future. Treasury and agency securities do not have credit risk. Credit risk should be evaluated based on the historical performance of the asset class being considered as well as the actual bond being evaluated. Rating agencies such

as Moody's and S&P publish ratings on bonds that the market uses as a guide for evaluating and pricing credit risk. The higher the rating, generally speaking, the lower the credit cost.

Convexity is the risk that the duration of a bond changes as interest rates change and is usually a cost to the investor as more principal is returned to the investor in lower rate scenarios and less principal is returned in higher rate scenarios. Convexity risk can be caused by prepayments on mortgage-backed securities, periodic and lifetime caps on adjustable rate MBS and call options controlled by the issuers of municipal and agency bonds. There are also bonds with structural options built into them such as collateralized mortgage obligations. Investors that own these bonds are said to be "short" options in the bond. There are models in the market that attempt to quantify this embedded cost in a bond and investors certainly use these. However, to really view the convexity risk in a bond, it is important to look at the price, yield, duration and average life profiles of a bond as interest rates change. This helps the investor understand the magnitude of convexity that exists in a bond. More volatile and asymmetric profiles mean higher convexity costs. While it is difficult to calculate and assign an actual convexity cost to a bond, it is possible to compare profiles of different bonds and determine which bonds have better or worse convexity profiles. For example, bonds with less stable profiles should have higher yields to compensate for the additional risk. Also, if two bonds have the same yield but one of the bonds has a more volatile or asymmetric profile, then the bond with the more stable profile is the better value.

Estimating a risk-adjusted return for each bond in consideration for investment can help determine which bonds represent the best relative value. While different bonds can be a better or worse fit for a particular bank balance sheet depending on what the investor may need, identifying all the risks in a bond allows the investor to determine the most fairly-priced bonds for the bank's portfolio.

If you have questions or thoughts or want to discuss specific strategies for your bank related to this topic, please feel free to contact your Country Club Bank representative. Thank you for your time today.

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