Inside the Bond Market

Valuing your bond between the time you buy and the maturity date - by Richard Croft

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The bond market is referred to as an "over-the-counter-market"; which means that, unlike stock markets, there is no centralized exchange. Rather, it is a decentralized market where transactions occur by phone or computer among participants who may be continents apart or in the next building. Trading volumes are enormous -- averaging more than 20 times the volume of the stock market.

The bond market serves two principal functions:

1. It acts as the medium through which borrowers (governments and corporations) and lenders (mutual funds, pension funds and individuals), come together. Bond dealers (normally called investment dealers) are in constant communication with these parties to assess borrowers' needs and lenders' appetites in order to structure bond issues that are of an appropriate term and cost to the borrower (issuer) while also meeting the needs of the various lenders. In the stock market, this is similar to when a company first becomes public and issues new stock.
2. Then after bond issues are distributed, the various parties that purchased them may wish to sell them or trade them for any number of reasons. This is the "over-the-counter" secondary market that exists between individuals and dealers. As there is no formal "exchange" in the bond market, these transactions take place over the phone or online.

Accrued Interest

Pay it when you buy, receive it when you sell

In the real world when you buy a bond you discover, in most instances, that you have to pay some accrued interest as well. Why is this and how is it calculated? Most bonds pay interest semi-annually or every six months. If you own a bond, you expect to be paid the accrued interest.

If, for whatever reason, you sell the bond prior to maturity and before the next interest payment is due, you are entitled to receive the interest that has accrued since the last payment. For example, assume that there are three months before the next payment is due and also suppose that you did not receive the accrued interest when you sold the bond; your money therefore earned nothing for that three month period and the next owner of the bond would receive the full six months interest payment when it comes due. Thus the new owner's money earned double for that period and you earned nothing. Since it is impractical and inconvenient to wait until the payment is received before selling the bond, the interest accrued is calculated and the new owner pays it to the seller on the settlement date. The new owner will then receive the full six-month payment when it is due.

Interest Rates and Bond Prices

by Richard Croft

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Understanding bond price changes, and ultimately predicting these price changes, requires a basic knowledge of the factors that affect bond prices.

The good news is that there are really only five fundamental factors that affect all bond prices. These factors are what I call bond price "conclusions". The combined effect of these factors explains virtually all of a bond's price changes. Let's take a look at the five "conclusions" before we look at the combined effect.

Conclusion 1: When interest rate levels rise, the prices of fixed income securities fall, and when interest rate levels fall, the prices of fixed income securities rise. This inverse price-yield relationship is the most important effect on bond price changes.

Conclusion 2: Bonds with longer maturities fall or rise more than bonds with shorter maturities. If, for example, interest rates fall 1%, the price on a 20-year bond will rise more than a 5-year bond.

Conclusion 3: Bonds with lower coupon rates will also move more in price than bonds with higher coupon rates. The coupon rate is the contractual interest obligation that a bond pays, usually semi-annually. If interest rates rise, for example, a 9% bond will not fall in price as much as a 4% bond.

Conclusion 4: Credit risk is the fourth determinant of all bond prices. Credit risk is primarily the ability of the bond's issuer to maintain interest or coupon payments on time and to repay principal amounts on schedule. Credit risk can be assessed in part by referring to an independent credit assessment from a reputable bond rating agency such as the Dominion Bond Rating Service or Standard and Poors. A ratings change from, say AA to BBB, can seriously hurt the price of the bond being downgraded.

Conclusion 5: Special features attached to a bond can have an important effect on both the new issue price and on its ongoing trading price in the secondary market. Special features include an extendible or retractable feature, a call provision, a conversion privilege, a sinking fund, a purchase fund, and many others.

The most important influence on a bond price is the current level of interest rates. As stated in Conclusion 1, when interest rates fall, bond prices rise as a result, and vice versa. The reason for this is that capital is mobile and will seek a home where the expected return is competitive. Bond prices, in turn, will have to adjust to provide that competitive return. If they did not adjust, investors would bail out of that bond, depressing its price in the market.

Imagine, for example, that current interest rates are 8%, and that anywhere you turn, you can invest at an 8% return. To keep the world simple, this means that Canada Savings Bonds, Guaranteed Investment Certificates and a host of other investments all offer a return of 8%. Then suppose a corporation such as BCE Inc. issues a bond that pays an 8% coupon rate. Since this bond issue is neither more nor less attractive than alternative investments, it will command a price in the market of 100% of face value, called 'par'. A $100 face value bond, in other words, will sell at $100 in the marketplace. There is no justification for paying more than par (called a premium) or less than par (called a discount), since the BCE bond is equally as attractive as anything else available in the marketplace.

Now suppose that the economy in general suffers a decline, and interest rates fall as a result, to a hypothetical 6%. CSBs, GICs and alternative investments now all offer a 6% return, which is competitive in the current market environment. However, the BCE Inc. bond still pays 8% annual interest, which is 2% more than anything else is paying these days. Therefore, investors will be willing to pay more than face value (i.e. pay a premium) for this bond because it is now relatively more attractive than alternative investments. Holders of the BCE Inc. bond might demand as much as $133 per $100 of face value. Investors who pay $133 to get $8 of interest per year will still make a 6% return ($8 divided by $133 times 100 equals 6%). The important point is that the original investor who purchased the 8% bond at $100 and then sells the 8% bond at $133 has made a 33% capital gain on top of any interest income: interest rates fell 2% and the bond rose 33%. That's Conclusion 1 in a nutshell: when interest rates fall, bond prices rise. Incidentally, the 33% return is taxed as a capital gain, meaning that only 50% of the gain is fully taxable.

This inverse price-yield relationship works the other way as well: when interest rates rise, bond prices fall. In this scenario, assume that interest rates rose to 10% from 8%. New bond, GIC and CSB issues all offer a return of 10%. The holder of the BCE Inc. bond, on the other hand, is stuck with an investment that pays only 8% in interest income. Since the BCE bond is relatively unattractive in this market environment, it will not command a price equal to its full $100 face value (i.e. it will trade at a discount to par). In fact, new investors seeking a return of 10% will only pay the BCE bond holder $80 per $100 face value. At this price, $8 of interest income received on an $80 investment will give them the desired return of 10%. Meanwhile, the BCE bond holder who has paid $100 for the bond and then sells it for $80 has realized a 20% capital loss. Interest rates rose, and the bond's price fell.

One additional thought: investors sometimes feel that if interest rates rise and the market value of their bond drops, they will simply hold on to maturity to receive par ($100 per $100 face value). This is done to avoid the "loss" of selling at a price below par prior to maturity. While it is true that they will receive par at maturity, this is at the expense of remaining in an investment that yields below-market rates for all the remaining years to maturity. The loss is just as real, even if it is not realized through a transaction.

Investment professionals watch developments in the economy very carefully to try to get a sense of the future direction of interest rates. So-called "Fed watchers" watch every move by the Federal Reserve Board and its chair Alan Greenspan, including the tone of his speeches and the thickness of his briefcase. The reason why is clear. Interest rate changes can significantly affect the total return made from investing in fixed income securities.

Yield Curves and What They Mean

by Richard Croft

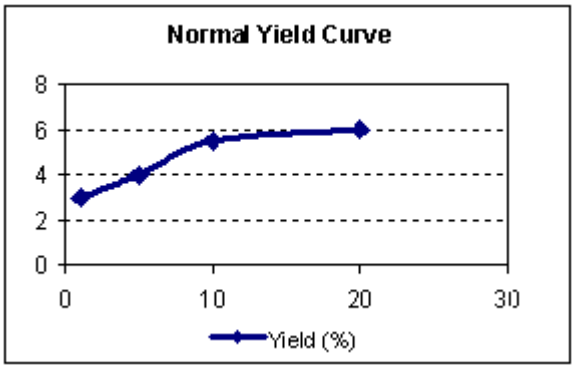
A yield curve is a picture of where interest rates are today. Some feel it is also a window to where rates are going in the future. Let's take a look at the types of yield curves, what they do mean about today, and what they might mean about tomorrow.

First of all, a yield curve is a graphical representation of where interest rates are today. There is not one interest rate; there is an interest rate for those who want to invest now for the next three months, there is another interest rate for those who want to invest now for the next six months, and so on out to thirty years and longer. The yield curve, then, shows the rate of return that can be locked in now for various terms into the future. The left, vertical axis of the graph shows the annual percent yield which is currently available in the marketplace. The bottom, horizontal axis shows the investment holding period. The yield curve is a line connecting the rates of return which can be earned to the time periods that can be committed to.

To give a simple example, suppose an investor could choose among the following returns for their respective investment holding periods:

Yield (%)	Holding Period (years)
3.0	1
4.0	5
5.5	10
6.0	20

At this point in time, an investor could lock in a one-year return of 3%. By locking in right now for the next five years, they could lock in an annual return of 4%. Further, an investment in a 10-year bond offers a 5.5% return per year right now, and 20-year bonds are currently returning 6% per annum. The current yield curve is found by simply graphing these data points.

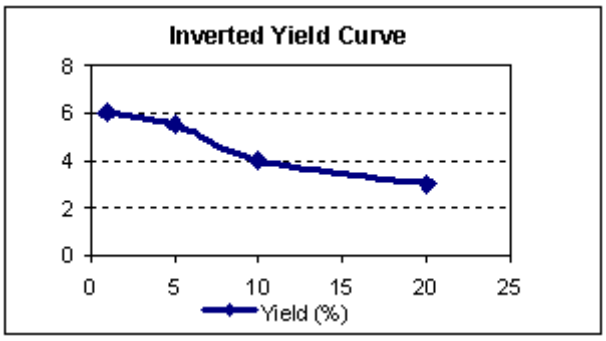


The investment instruments used to construct the yield curve should all have the same risk, the same features and the same coupon rate. As a result, the only difference in the returns that can be earned should be attributable to the holding period. Government of Canada bonds are often used to construct yield curves because: first, they have a broad range of maturities available; second, all maturities have the same credit risk as each other; and third, differences in coupon rates are nullified by using stripped (no coupon) versions of the various bonds.

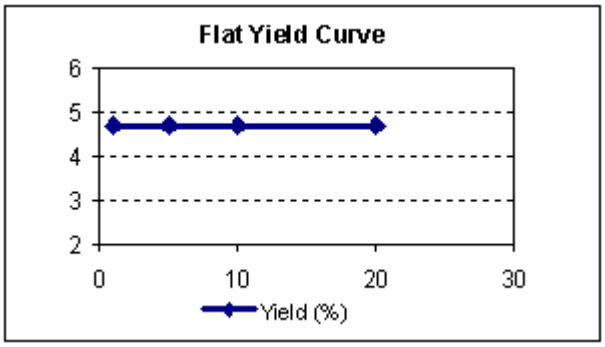
There are four basic shapes of yield curves. The shape exhibited in the graph above shows that longer holding periods are associated with higher returns. This is the usual case, and is referred to as a normal yield curve. In February 2001, Canada had a normal yield curve right.

A person who is about to renew their mortgage and is undecided about what term to choose for the renewal period could check the current yield curve. The yield curve would tell them approximately how much a one-year, three-year, five-year and seven-year mortgage, for example, will cost them in interest. If the yield curve is normal, a seven-year mortgage will cost them somewhat more than a five-year mortgage, which in turn would cost them more than a three-year mortgage.

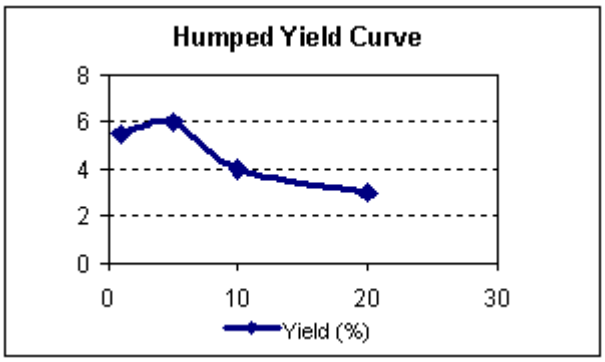
When longer holding periods offer successively lower returns, the yield curve is said to be inverted. As an example, in 1982 short term interest rates were approximately 22.5% for a six-month term, 19.5% for a one-year term and 14% for a five-year term. Inverted yield curves are rare, and do not stay around long when they do happen. The yield curve in Canada has been inverted twice in the last 20 years, each time for only about three weeks. During this time period, a person renewing their mortgage might find a longer-term mortgage costs them less interest than a shorter-term mortgage.



The third basic type of yield curve is called a flat yield curve, and indicates that returns on short, medium and long-term investments are all approximately the same as each other. One-year bonds, five-year bonds and 20-year bonds all offer approximately the same total return. A flat yield curve can occur as a normal yield curve transitions to an inverted one and vice versa.



Finally, a humped yield curve is characterized by increasingly higher yields for the first few years of holding periods, and then lower yields for longer holding periods. Canada last experienced a humped yield curve in the summer and fall of 2000, with the peak of the hump at about the three-year term.



Some market prognosticators believe that they can look at the current yield curve and find hidden messages in them about where interest rates are headed in the future. This takes at least as much skill as reading tea leaves, tarot cards or palm lines to predict the future or, to use an example closer to the stock market, technical analysis. There are three schools of thought on the theory of interest rate determination.

1. The Liquidity Preference Hypothesis - This theory believes that investors dislike having their money tied up, and demand extra return for longer holding periods. The longer a person has to defer current consumption, the more marginal compensation they demand. Another way of looking at this theory is that people prefer liquidity, defined as ready access to their money, and will accept a lower return to get it. The liquidity preference hypothesis does a great job of explaining a normal yield curve, which indicates lower returns for shorter holding periods and higher returns for longer holding periods. This theory cannot, however, explain inverted, flat or humped yield curves.

2. The Expectations Hypothesis - This approach suggests that the yield curve is a picture of what people expect rates to be in the future. For example, a humped yield curve with the peak at three years out means that people generally expect interest rates to rise over the next three years,

after which they will begin to trend down again. A normal yield curve is interpreted as a signal that interest rates are expected to rise over the long term.

This theory has some intuitive appeal. First, it can explain all four yield curves. Second, whether interest rates actually move as the expectations people expect them to or not, there is no question that billions or even trillions of business dollars are being borrowed or invested today at the posted rates. Therefore, if interest rates right now are higher for a three-year loan than for a four-year loan, intelligent business people who know this must have a good reason to still borrow for a three-year term rather than four. The same basic principle applies to interest rate futures, where some very smart money is being invested on the future direction of interest rates.

3. The Market Segmentation Hypothesis - This group believes that there is not one continuous bond market, but several discrete segments, with different players in each segment. For example, the short-term bond market is dominated by the chartered banks and money market dealers who, through competitive supply and demand, arrive at a series of short term rates. Other players only play in the long segment, such as pension funds, life insurance companies and real estate and construction companies. Since these organizations deal with long-term projects or liabilities, they really have no interest in borrowing short-term, and vie with their competitors to set rates in the long end of the market. A third set of players, including mutual funds, corporations and casualty insurance companies, typically only borrow and invest in the mid-term segment, influencing rates in that segment. Therefore, the yield curve can be thought of as a composite of several segments, with rates in each segment set by the players in that segment. This hypothesis can also explain all four yield curves.

When interest rates fall, bond prices rise. Further, the longer the maturity, the more the bond rises in price. Therefore, when the yield curve changes from normal to flat or inverted, it can be a source of great joy to a bond portfolio manager who owns long term bonds through this period. The prospect of calling this trade correctly is why so much scrutiny is put on yield curves and their potential forecasting qualities.