WHY DO I LIKE PAR BONDS?

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The truth of the matter is, I don't like to buy par bonds. Before we are done discussing this subject, I will explain why. When I started in the bond business, my mentors taught me that investors "liked" to buy par bonds. As I picked up the trade, I noticed that it was decidedly easier to sell par bonds. Investors were reluctant to pay a premium and many were equally suspicious of discounted fixed income securities (bonds).

It is embarrassing to admit that I was unable to explain exactly how bond prices are calculated until I was several years into my profession. I have never found what I considered a good discussion of this fundamental topic…something a neophyte customer could read quickly, gaining an understanding of the basics of bond math. Perhaps if I explain it once and do a good job, everyone will benefit.

WHAT IS PAR?

A dictionary definition is "Commerce: the nominal or face value of stocks, bonds, etc". When applied to bonds, this term refers to the amount of money due to the owner of a bond on its maturity date. This terminal value is commonly expressed mathematically with the number 100.

In the early days of Wall Street, traders gathered around the old buttonwood tree and bot and sold stocks as well as bonds. The common denomination of bonds in the late 1700's was $100. Naturally, they had $100 terminal values. Convenience and inflation have increased round lot trading; units to $5,000, $100,000 and in some cases $1,000,000. The jargon, however, has never changed. Par is still defined by the mathematical expression 100. Many of us find it easier to understand the term "100 cents on the dollar," another mathematical definition of par.

Every bond issue has its minimum denomination. Most corporate bonds are issued in $1,000 lots, municipals in $5,000 denominations, and governments in $10,000 pieces. Regardless of the type of bond we are dealing with, the "dollar price" of a bond is calculated as a percentage of par. A dollar price of par would be 100, or 100% of 100. A dollar price of 99 would be 99% of 100, 101…101% of 100. An investor who buys a $5,000 bond at 99 would be asked to pay .99 X $5,000 or $4950 for a bond, which will have a maturity, or terminal value, of $5,000.

EXAMPLE OF A PAR BOND

Let's assume an investor purchases a municipal bond issued by a city in his home state. The size of the transaction is $10,000 and the bonds are purchased at par. In spite of the fact that the bonds are issued in $5,000 denominations, bond jargon describes this trade as a "10 bond" transaction. The investor expects to receive semi-annual interest payments over the five-year life of the transaction. The dates of the cash flows expected from this transaction appear as follows:

05/01/89

Bot: $10,000 Starcity G.O. 6.00% 05-01-94
Bonds are priced to yield 6.00%

11-01-89	cpn	300.00	05-01-92	cpn	300.00
05-01-90	cpn	300.00	11-01-92	cpn	300.00
11-01-90	cpn	300.00	05-01-93	cpn	300.00
05-01-91	cpn	300.00	11-01-93	cpn	300.00
11-01-91	cpn	300.00	05-01-94	cpn	300.00

05-01-94 maturity $10,000 principal returned.

Pretty simple transaction eh? We invest our $10,000, receive semi-annual interest payments until maturity, and collect our principal on the day that it was promised to us. When a bond is purchased at par and matures at par, its "yield to maturity" will always equal the "nominal rate" or "coupon rate." In our example, the coupon rate as well as the yield to maturity is 6.00%.

PREMIUMS AND DISCOUNTS

A bond that is offered at a dollar price higher than par (100) is said to be priced at a premium. Bonds offered at a dollar price less than par are said to be priced at a discount. Premium bonds are purchased at a price higher than their terminal value. Discount bonds are priced below their terminal values. Par bonds (neither a premium nor a discount) are priced at their terminal value…100.

Discount bonds always produce a yield higher than their coupon rate. Conversely, premium bonds always produce a yield lower than their coupon rate. By calculating a bond's yield to maturity, an investor is able to compare the relative value of bonds offered at premiums and discounts as well as par.

Investors often hear the expression "these bonds are priced to yield 6.00%"; this practice allows the yield to maturity calculation to determine the dollar price of the bond. When an investor buys a bond priced to yield, he has agreed to accept the dollar price that will facilitate a yield to maturity based upon a given settlement date.

Bond prices are determined by present-value calculations. The same formula calculated the dollar price of bonds trading at par, a discount, or a premium. Once investors understand how bond prices are calculated, they will realize that "par" has become a colloquialism for the bond price 100.

However, the bond price 100 can be calculated while "Erroneously, a localism or regionalism" defines the word "colloquialism." As we have outlined in the paper "Sensationalism and the Investment Investor," intelligent decisions are fundamental to successful investing. The author strongly recommends decisions based on calculated prices as opposed to traders' jargon that has failed to evolve over a two hundred-year period of time.

Present value is a concept that is difficult for most people to grasp. Consider the following analysis: An investor with $1 in assets knows that the "current" or "present" value of that $1 is in fact $1. If that same investor is of the opinion that he can earn 10% by investing that $1 for one year, he can then calculate the "future" value of his $1 invested at a rate of 10% to be $1.10. Conversely, our investor can calculate that the present-value of the $1.10, payable to him in one year, discounted at a rate of 10%, to be $1.

Present value and future value always have three components: time, principal, and a given rate of return. Given two of these elements, the third can always be calculated.

When calculating the dollar price of a bond, we are in fact calculating the present value of the stream of future cash flows generated by the bond. These cash flows are discounted at a rate of interest equal to the yield of maturity. An example, using the par bond maturing in five years previously described, will undoubtedly be helpful.

Future cash flows include coupon interest as well as the investor's principal returned at maturity:

05-01-89

Bot: $10,000 Starcity G.O. 6.00% 05-01-94
Bonds are priced to yield 6.00%

11-01-89	cpn	300.00	05-01-92	cpn	300.00
05-01-90	cpn	300.00	11-01-92	cpn	300.00
11-01-90	cpn	300.00	05-01-93	cpn	300.00
05-01-91	cpn	300.00	11-01-93	cpn	300.00
11-01-91	cpn	300.00	05-01-94	cpn	300.00

05-01-94 maturity $10,000 principal returned.

The present value of these cash flows is:

05-01-89

Bot: $10,000 Starcity G.O. 6.00% 05-01-94
Bonds are priced to yield 6.00%

11-01-89	cpn	291.56	05-01-92	cpn	251.25
05-01-90	cpn	282.78	11-01-92	cpn	243.93
11-01-90	cpn	274.54	05-01-93	cpn	236.83
05-01-91	cpn	266.54	11-01-93	cpn	229.92
11-01-91	cpn	258.78	05-01-94	cpn	223.23

present value of coupons = $2559.07

05-01-94 maturity $10,000 present value = $7440.93

present value of bond = $10,000.00

A dollar price for this security is calculated by dividing the present value by the future value and multiplying the result by 100, 10,000/10,000 X 100 = 100. It is extremely important for the reader to understand that the price of 100 can be calculated for any bond that is priced at a yield equal to the bond's coupon rate. It is my opinion that this price of 100 is of no more significance than a price of 95, 105, or 110.

How much would an investor have to pay for a bond due in five years with a coupon rate of 8.00%, priced to yield 6.00%? Let's assume we are dealing with the same issuer established by our first example.

Future cash flows include coupon interest as well as the investor's principal returned at maturity:

05-01-89
Bot: $10,000 Starcity G.O. 8.00% 05-01-94
Bonds are priced to yield 6.00%

11-01-89	cpn	400.00	05-01-92	cpn	400.00
05-01-90	cpn	400.00	11-01-92	cpn	400.00
11-01-90	cpn	400.00	05-01-93	cpn	400.00
05-01-91	cpn	400.00	11-01-93	cpn	400.00
11-01-91	cpn	400.00	05-01-94	cpn	400.00

05-01-94 maturity $10,000 principal returned.

The present value of these cash flows is:

05-01-89
Bot: $10,000 Starcity G.O. 8.00% 05-01-94
Bonds are priced to yield 6.00%

11-01-89	cpn	388.35	05-01-92	cpn	334.99
05-01-90	cpn	377.04	11-01-92	cpn	325.24
11-01-90	cpn	366.06	05-01-93	cpn	315.76
05-01-91	cpn	355.39	11-01-93	cpn	306.59
11-01-91	cpn	345.04	05-01-94	cpn	297.64

present value of coupons = $3,412.10

05-01-94 maturity $10,000 present value = $7,440.94

present value of bond = $10,853.04

Like our bond priced at par, the dollar price is calculated by dividing the present value by the future value and multiplying the result by 100…10,853.04/10,000 X 100 = 108.530.

These present value calculations allow investors to compare the economic benefits of owning an 8.00% bond due in five years at the price of 108.53, with those derived from owning a 6.00% bond due in five years priced at 100.00 Obviously, the comparisons do not stop here. If the bonds can trade at a premium, they can surely trade at a discount (and often do!). It will come to no revelation to the reader that the same present value calculations are used to price discount bonds. Surprising no one, we will calculate the dollar price of a 4.00% bond using the same issuer and interest rate scenario.

Future cash flows include coupon interest as well as the investor's principal returned at maturity:

05-01-89
Bot: $10,000 Starcity G.O. 4.00% 05-01-94
Bonds are priced to yield 6.00%

11-01-89	cpn	200.00	05-01-92	cpn	200.00
05-01-90	cpn	200.00	11-01-92	cpn	200.00
11-01-90	cpn	200.00	05-01-93	cpn	200.00
05-01-91	cpn	200.00	11-01-93	cpn	200.00
11-01-91	cpn	200.00	05-01-94	cpn	200.00

05-01-94 maturity $10,000 principal returned.

The present value of these cash flows is:

05-01-89
Bot: $10,000 Starcity G.O. 4.00% 05-01-94
Bonds are priced to yield 6.00%

11-01-89	cpn	194.17	05-01-92	cpn	167.50
05-01-90	cpn	188.52	11-01-92	cpn	162.62
11-01-90	cpn	183.03	05-01-93	cpn	157.88
05-01-91	cpn	177.70	11-01-93	cpn	153.28
11-01-91	cpn	172.52	05-01-94	cpn	148.82

present value of coupons = $1,706.04

05-01-94 maturity $10,000 present value = $7,440.94

present value of bond = $9,146.98

A dollar price for this security is calculated by dividing the present value by the future value and multiplying the result by 100…9,146.98/10,000 X 100 = 91.4698.

Several conclusions are available to the reader at this point. Let's make a list of them:

1. Bond prices are calculated by using formulas, which measure the present value of future cash flows.
2. Bond prices equal to par are calculated with the same formula used to calculate the value of premium and discount bonds.
3. Yield to maturity is a concept that can be used to measure the relative value of bonds priced at a discount, premium, or par.
4. Industry jargon has allowed the term "par" to become synonymous with the calculated price "100". Understanding the calculation is much more profitable than speaking the jargon.
5. In our common example, the present value of the principal always calculates to $7,440.94. When the coupon rate changes, only the present value of the coupon payments change. By playing with these numbers, the investor can confirm the logic employed in calculating bond prices.

WHAT DO I DO WITH THIS EDUCATION?

An investor who reads this text should gain a working knowledge of how bonds are priced. Most individual investors do not understand what the reader has learned from this epistle. As a result, investors have a tendency to purchase bonds priced at par (100). Why not? We all shy away from things we don't understand. Someone uneducated in these present value concepts will have a preference to pay no more for a bond than it will be worth at maturity.

Underwriters and traders understand bond pricing and employ these fundamentals to their own advantage. Large issues of bonds designed to be sold to individual investors will typically be priced at par. This often allows the bond underwriter to favor the issuer by selling as many bonds as possible at as low an interest rate as possible.

Since investors favor bonds priced at par, bonds priced above or below par often need to be marketed at slightly higher yields. This is the main reason I prefer not to buy par bonds. The investor seeking to maximize total return should seize upon this knowledge and broaden the range of dollar prices he is willing to accept. If a "par" price is good for the issuer, it may not be the best price for the investor.

John Mendelson, one of my favorite Wall Street tutors, observes the fascination that the human mind holds for the passage of a vertical force through a horizontal plane…Will the Dow break 2500?…Can IBM trade below 100?… Will the prime rate rise above 11%? This same idiosyncrasy creates obtuse price barriers in investors' minds. I have worked with investors who openly state a willingness to buy bonds priced no lower than 90, or higher than 105.

Why are these numbers sacrosanct? Have we decided that value only occurs between the prices of 90 and 105? Consider the contrary. If buyers are willing between 90 and 105, perhaps value occurs most often below 90 and above 105. Is this a bizarre thesis or merely an extension of the contrarian school of thought that has propelled so many investors to excessive wealth?

At this point, investors should consider their ultimate objectives. Do you want to maximize current income? How important is deferred growth? What is the investor's tax environment? Is the income beneficiary the same as the remainderman? Is *any* current income necessary? A few examples might be helpful.

1. During periods of "high" interest rates, professionals often choose deep discount bonds. This strategy allows a portfolio the ability to capture current rates of return without forcing the investor to constantly reinvest large future income flows in what he expects to be "lower" interest rate environments. Conversely, the same investor would buy a premium bond during periods of "low" interest rates. This type of bond will generate large future cash flows, which the investor should be able to reinvest at what he assumes will be "higher" interest rates.
2. The investor who is providing for the education of a minor might choose the ultimate discount bond, one with a zero coupon. These securities lock in the investor's yield, paying no coupon interest until maturity.
3. A trust account, one that is required to provide high current returns to an interest beneficiary and minimal distributions to the remainderman, may choose to use bonds with high coupon rates purchased at a premium. This transaction would fulfill both requirements of the trust. Investors desiring predictable long term growth and a minimal amount of current return may choose to purchase a portfolio of deep discount bonds.

BE AWARE OF CALL FEATURES…

It is only fair to offer an additional observation before drawing this article to a conclusion. Bonds are often subject to periodic call from the issuer. This can cause negative results when the investor has paid a premium and extraordinary gain when bonds are purchased at a discount. Callable bonds are priced with the same formulas previously discussed. However, the terminal date and terminal value of the bond should be equal to the call date and call price.

The purchase of callable bonds is but another opportunity for the investor to create value. Any bond that cannot be explained in one or two sentences is commonly called a "story" bond. The longer the story, the more the investor is entitled to an advantageous return.

Bonds are financial tools; investors need to understand how they are priced. Escape the burdens of handed down jargon and colloquialisms. Define your objectives and buy the type of bonds that fit the task at hand. From time to time, the market will grow an adversion to premium bonds and their yields to maturity will grow an advantage to comparable bonds priced at par. The same thing can happen to discounts. Keep your mind open, use your education, and profit from your intelligence.