

# Premium bonds

Why is there such a difference between retail investors’ preference for lower coupon bonds and institutional investors’ preference for higher coupons, as observed in the accompanying quotation from the MSRB’s study?

Bonds with lower coupons will trade with lower dollar prices — in many cases at prices at or near \$100 (i.e., the par value that will be paid at maturity). By contrast, bonds with higher coupons also have higher prices, requiring buyers to pay a premium in excess of par value. Many retail investors prefer to purchase par bonds because they like knowing that, when their bonds mature, they will receive the full amount of their initial investment and will not have inadvertently spent more than they earned.

Institutional investors, on the other hand, like the lower price volatility of premium bonds, especially when those bonds can be redeemed by the issuer prior to maturity. And they favor bonds that are less likely to suffer negative tax treatment should their price fall significantly below par. To better understand these considerations, it helps to review how par and premium bonds work.

*“Retail investors tend to purchase municipal bonds with lower coupons than institutional investors,” reported the Municipal Securities Rulemaking Board. “Customers buying 100 bonds or less were significantly more likely to buy bonds with a coupon rate of 3.0% to 3.5%, while customers purchasing \$1 million or more were more likely to buy bonds with a 5% coupon.”*

## Premium vs. par bonds – what’s the difference?

Consider two hypothetical 5-year bonds, both purchased at a 1% yield. One is a par bond with a 1% coupon, and the other is a premium bond with a 3% coupon. We invest \$1 million in each bond and assume a 1% reinvestment rate. The comparison demonstrates that if two bonds have the same maturity and the same yield, their total return will be the same as long as all cash flows are reinvested at the original yield.

### THE PAR BOND

*Coupon: 1% price: \$100*

At maturity, the investor receives the \$1 million par value. In addition, the investor has received \$50,000 in coupon payments (\$5,000 in each of 10 semiannual periods). If those payments were reinvested at 1% (0.5% per period), their compounded value after 5 years would be \$51,140 (see Appendix). Here is how the total return would be calculated:

<b>Invest:</b>	\$1,000,000
<b>Receive:</b>	\$1,000,000 par paid at maturity
+	\$ 51,140 compounded value of 10 coupon payments
	\$1,051,140
<b>Total return:</b>	$(\$1,051,140 / \$1,000,000)^{0.1} - 1$
	= 0.005 per semiannual period = 1% per year

## THE PREMIUM BOND

Coupon: 3% price: \$109.73

At a 1% yield, a 5-year premium bond with a 3% coupon will be priced at \$109.730. The drop from \$1,097,304 to \$1,000,000 at maturity makes it seem that the investor is losing principal. However, the investor also receives \$150,000 in coupon payments (\$15,000 every six months). The compounded value of those payments would be \$153,420 (see Appendix).

Invest:	\$1,097,304	
Receive:	\$1,000,000	par paid at maturity
	+ \$153,420	compounded value of 10 coupon payments
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	\$1,153,420	
Total return:	$(\$1,153,420 / \$1,097,304)^{0.1} - 1$	
	= 0.005 per semiannual period = 1% per year	

## Why purchase premium bonds?

*Most bonds are premium bonds*

As a result of the decline in interest rates during the last decade, and the preference of institutional investors for premium bonds, only a small segment of the municipal market consists of bonds priced at par or less. At the end of February 2022 only 13.6% of the bonds in the Standard & Poor's Municipal Bonds Index had coupon rates of less than 4% but more than 0%. Furthermore, 61.8% of the bonds had coupon rates of 5% or more.

Given that 30-year general obligation bonds rated triple-A were then yielding 1.98%, and all shorter maturities were yielding less (according to the scale by Refinitiv), the municipal market is clearly dominated by premium bonds.

*Premium bonds are less volatile*

The longer it takes for an investor to receive the cash flows due on a fixed income investment, the more the value of that security will change in response to changing interest rates. Higher coupons deliver more of the return sooner. One measure of the price volatility of a bond is its modified duration. The par bond in our example would have a modified duration of 4.87 years, while the duration of the premium bond would be 4.67 years.

Optional redemption provisions, found in most municipal bond deals, can greatly reduce the price volatility of bonds.

It is most common for municipal bonds to be redeemable at par at the option of the issuer starting 10 years after the bond was issued. A premium bond that can be redeemed early at a price of par will be priced to the redemption date rather than to maturity.

For example, a bond with a 3% coupon, yielding 2.00%, due in 20 years would have a price of \$116.417 and a duration of 15.44 years. If that same bond were priced to a call date in 10 years, its price would be \$109.023, and its duration would be just 8.69 years. Pricing to the call date limits the upside potential of the bond if interest rates fall, but it also means less of a drop in price if rates rise.

A bond that is priced to a call date today would be priced to maturity in the future if interest rates rise to the point where they exceed the coupon rate. For this reason, bond valuation takes into consideration the potential that a callable bond may someday be priced to maturity, which is known as "extension risk." A bond with a low coupon naturally has a greater likelihood that its coupon rate will be below future interest rates, and hence it has greater extension risk.

We saw that a 3.00% bond due in 20 years, but priced to yield 2.00% to a 10-year call date, would have a price of \$109.023 and a duration of 8.69 years. A 5.00% bond likewise due in 20 years, and priced to yield 2.00% to a 10-year call date, would have a price of \$127.068 and a duration of 8.17 years. If interest rates were to rise to 3.50%, the 3.00% bond would be priced to its maturity date in 20 years, while the 5.00% bond would still be priced to the 10-year call date. Here is how the prices would change.

### Price change when yields rise from 2.00% to 3.50%

Coupon	Beginning price	Ending price	Percent change
3.00%	109.023	92.851	-14.8%
5.00%	127.068	112.525	-11.4%

By continuing to be priced to a 10-year call date, and with a starting duration to the call date that was already shorter than that of the 3.00% bond, the 5.00% bond would lose less value than the 3.00% bond in this rising rate scenario.

*Premium bonds may avoid negative tax consequences*

If you buy an outstanding bond in the secondary market at a price of less than par, and hold it until it matures at the principal value of \$100, the increase in the value of the bond

would generate a tax liability. The amount of the tax varies depending on how much of a discount was inherent in the price you paid for the bond. If the amount of the discount was less than 0.25% for every full year until maturity, the appreciation (or accretion) would be treated as a capital gain, but if the discount was deeper than 0.25% per year, the appreciation would be taxed as ordinary income.

For two bonds with the same yield and maturity, and priced at a discount, the one with the higher coupon rate will have the smaller discount. For example, if interest rates were to rise to 3.25%, a 3% bond due in five years would have a price of \$98.855, which means that its accretion would be taxed as a capital gain. However, the 1% bond would have a price of \$89.693, which would result in its accretion being taxed as ordinary income. A prospective buyer would demand a higher yield to compensate for the higher tax, which means a lower price for the seller.

## How does coupon rate affect pricing?

Bonds with lower coupons typically provide somewhat higher yields than bonds with higher coupons. This is because of their greater extension risk, longer duration and the greater likelihood that they may someday become discount bonds whose accreted market discount would be taxed as ordinary income. For example, according to Refinitiv, on 01 Mar 2022, high grade bonds with 5% coupons yielded 1.86% if due in 23 years and callable in 10 years, and 1.87% if due in 24 years, for a difference of 0.01%. However, on the following day, 5% New York City water bonds due in 23 years yielded 2.36%, while 3% bonds of the same issuer due in 24 years yielded 2.64%, for a difference of 0.28%.

## Preserving principal while the premium shrinks

Many investors are discouraged from purchasing premium bonds because of the idea that the value of their investment will decrease as the price of the bond declines from its premium purchase price to par. They realize they need to reinvest part of the coupon payment if they want to maintain the principal value of their portfolio.

The amount that they need to reinvest every six months will be equal to the amount of premium that would be amortized during the first semiannual payment period. This amount is determined by multiplying the semiannual yield at which the bond was purchased by the purchase price, and subtracting that product from the semiannual coupon payment.

In our example of a 3% bond yielding 1% and due in 5 years, the semiannual coupon per \$100 par value would be \$1.50, and the yield in dollars would be \$0.55 ( $\$109.73 \times 0.005 = \$0.55$ ). The amount amortized of \$0.95 would be subtracted from the purchase price to produce the ending book value of \$108.78.

In the next payment period, the new book value would be multiplied by the purchase yield to determine the amortization.

Federal tax rules require that holders of tax-exempt municipal bonds amortize the premium of their bonds so that they do not recognize as a capital loss the amount by which the premium declines in value as a function of time. Thus, the gain or loss would be based on the difference between the sale price and the book value at the time of sale (or "adjusted purchase price"). For more information on the

### Amortization schedule

Period ending	Starting book value(\$)	Coupon (\$)	Yield (%)	Amortization (\$)	Ending book value (\$)	Compounded reinvested coupon (%)
31 Jul 2022	109.73	1.50	0.55	0.95	108.78	0.95
31 Jan 2023	108.78	1.50	0.54	0.96	107.82	1.91
31 Jul 2023	107.82	1.50	0.54	0.96	106.86	2.87
31 Jan 2024	106.86	1.50	0.53	0.97	105.90	3.83
31 Jul 2024	105.90	1.50	0.53	0.97	104.93	4.80
31 Jan 2025	104.93	1.50	0.52	0.98	103.95	5.78
31 Jul 2025	103.95	1.50	0.52	0.98	102.97	6.76
31 Jan 2026	102.97	1.50	0.51	0.99	101.99	7.75
31 Jul 2026	101.99	1.50	0.51	0.99	101.00	8.74
31 Jan 2027	101.00	1.50	0.50	1.00	100.00	9.73
			Sum	9.73		

## Premium bonds

tax treatment of tax-exempt bonds, investors may want to obtain Publication 550 from the Internal Revenue Service.

An investor can preserve the original principal amount of the investment by reinvesting a portion of the coupon income equal to the amount by which the premium is amortized during the first semiannual payment period. If the reinvested

coupon income earns the yield of the bond, the compounded value of the reinvested coupons at the maturity date will equal the original premium. In our example, the investor would reinvest \$0.95 of the \$1.50 coupon payment received every six months, as illustrated in the column labeled “Compounded Reinvested Coupon” in the amortization schedule on page 3.

## Appendix: Compounded value of coupon payments

**Par amount:** \$1,000,000

**Semiannual rate:** 0.50%

Period ending	1% coupon bond		3% coupon bond	
	Coupon (\$)	Compounded value (\$)	Coupon (\$)	Compounded value (\$)
31 Jul 2022	5,000	5,230	15,000	15,689
31 Jan 2023	5,000	5,204	15,000	15,611
31 Jul 2023	5,000	5,178	15,000	15,533
31 Jan 2024	5,000	5,152	15,000	15,456
31 Jul 2024	5,000	5,126	15,000	15,379
31 Jan 2025	5,000	5,101	15,000	15,302
31 Jul 2025	5,000	5,075	15,000	15,226
31 Jan 2026	5,000	5,050	15,000	15,150
31 Jul 2026	5,000	5,025	15,000	15,075
31 Jan 2027	5,000	5,000	15,000	15,000
	<b>50,000</b>	<b>51,140</b>	<b>150,000</b>	<b>153,420</b>

Compounded Value = DollarAmount \* (1 + Rate) ^ NumberOfPeriods

## For more information, please visit [nuveen.com](http://nuveen.com).

### Endnotes

#### Sources:

Different Buying Patterns of Retail and Institutional Investors in Municipal Bonds

Municipal Securities Rulemaking Board

<http://www.msrb.org/~media/Files/Resources/MSRB-Different-Buying-Patterns-of-Retail-and-Institutional-Investors.ashx>

Publication 550, Investment Income and Expenses

Internal Revenue Service

<https://www.irs.gov/pub/irs-pdf/p550.pdf>

<https://emma.msrb.org/Security/Details/AD24A6CA55216D8D3DB74DB9B92743772>

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