"Tax treatment of discounts for municipal bonds"

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Most investors think that tax-exempt municipal bonds are exempt from federal taxes regardless of the prices at which the bonds are purchased. In reality, if a tax-exempt municipal bond is purchased in the secondary market at a discount, there is a good chance that a portion of the income is taxable.

The discount on a purchased municipal bond can be categorized into: (1) Original Issue Discount ("OID"); (2) De Minimis Market Discount; and (3) Market Discount. Depending on the situation, the income resulting from these discounts could be tax-exempt, subject to ordinary income tax, subject to capital gains tax, or a combination thereof. There are a number of Internal Revenue Service ("IRS") publications[1] that describe the taxation of discounts on municipal bonds. In this report, we summarize key points and provide our interpretation of the tax rules applicable to these discount categories[2]. Throughout this paper, we assume the investor is subject to federal income taxation as it applies to individuals. Investors should consult their own tax advisors regarding the rules as they might apply to their specific situations.

This paper is divided into sections. The first section outlines tax rules for municipal bonds issued at par or a premium. The second section discusses tax rules for municipal bonds with OID. We then summarize the tax analysis when a bond purchased at a discount is sold with Price Appreciation. Examples follow to illustrate the taxation of different types of bonds and discounts. The last section discusses the impact of taxation on various types of discounts on the after-tax yields of municipal bonds.

Municipal bonds issued at par or a premium and purchased at a discount

- **De Minimis Market Discount**
    - If the discount at purchase is less than the Maximum Allowed De Minimis Amount of one-fourth of 1% (0.25%) of the stated redemption price of the bond multiplied by the number of full years to maturity from the purchase date, the discount is called a De Minimis Market Discount. For example, suppose a bond is purchased at $96 and it has 20 years left to maturity. Since the discount of $4 (= $100 – $96) is less than the Maximum Allowed De Minimis Amount of $5 (= $0.25 x 20), the discount is called a De Minimis Market Discount.
    - De Minimis Market Discount would be subject to capital gains tax if the bond is sold (or redeemed) at a price greater than its purchase price.
- **Market Discount**
    - If the discount at purchase is greater than or equal to the Maximum Allowed De Minimis Amount, the discount is categorized as a Market Discount. For example, suppose the same bond as in the example above is purchased at $93 so the discount is $7; then this discount is called a Market Discount since it's greater than the Maximum Allowed De Minimis Amount of $5.
    - When a Market Discount bond is purchased, the investor can elect to include Accrued Market Discount in current interest income.
    - If the investor chooses not to include the Accrued Market Discount in current interest income, Accrued Market Discount will be recognized in income when the bond is sold (or redeemed). In this case, upon the bond's sale (or redemption), any gain must be treated as ordinary interest income, up to the amount of the Accrued Market Discount; and any Price Appreciation in excess of the Accrued Market Discount will be treated as capital gains. We'll assume in this paper that the investor does not elect to include the Accrued Market Discount in current interest income.
    - Accrued Market Discount is computed in one of two ways: (1) Ratable Accrual Method – treat the Accrued Market Discount as equal, daily installments during the period the bond is held; (2) Constant Yield Method – compute the Accrued Market Discount using the purchase yield. We shall use the Constant Yield Method throughout this paper.

[1] Including, but not limited to, Publication 550, Publication 1212, and Section 1278(b) of the IRS Code.

[2] To simplify discussion, we make the following assumptions on the municipal bonds in this paper: (1) federally tax-exempt at issuance; (2) issued after April 30, 1993; (3) remaining maturities are longer than 1 year; (4) non-floating instruments; (5) no prepayments or early redemptions; (6) all purchases/sales occur on coupon payment dates (if any) so clean prices equal full prices; and (7) all redemption prices are assumed to be $100.

Municipal bonds with Original Issue Discount

- **Original Issue Discount ("OID")**
  - A bond has OID when the bond is issued for a price that is less than $100. OID is the difference between $100 and the issue price. For example, if a bond was issued at $85, the OID is $15.
  - All bonds that pay no interest prior to maturity are presumed to have an OID. Zero-coupon bonds are one example of these bonds.
  - Accrued OID on tax-exempt state or local government bonds is treated as tax-exempt interest.
- **De Minimis Market Discount ("OID")**
  - For a bond with OID, if the purchase price is less than the Accreted Issue Price, and if the difference between the two prices is less than a Maximum Allowed De Minimis Amount of one-fourth of 1% (0.25%) of the stated redemption price of the bond multiplied by the number of full years to maturity from the purchase date, this price difference is called a De Minimis Market Discount. For example, suppose a bond was originally issued at a price of $80 and suppose, on the date of purchase, the Accreted Issue Price is $85 and the bond has 20 years left to maturity. Assume this bond is purchased at a price of $81. The difference between the Accreted Issue Price on the purchase date and the purchase price is $4 (= $85 - $81). Since $4 is less than the Maximum Allowed De Minimis Amount of $5 (= $0.25 x 20), this $4 is a De Minimis Market Discount.
  - De Minimis Market Discount for a bond with OID could be subject to capital gains tax upon the bond's sale (or redemption).
- **Market Discount ("OID")**
  - For a bond with OID, if the purchase price is less than the Accreted Issue Price on the purchase date, and if the difference between the two prices is greater than the Maximum Allowed De Minimis Amount, this price difference is called a Market Discount. Let's look at the same bond as in the example above where it was issued at a price of $80, has 20 years left to maturity, and has an Accreted Issue Price of $85. Assume this bond is purchased at a price of $75. The difference between the Accreted Issue Price on the purchase date and the purchase price is $10 (= $85 - $75). Since $10 is greater than the Maximum Allowed De Minimis amount of $5 (= $0.25 x 20), this $10 is a Market Discount.
  - When a bond with OID is purchased at a Market Discount, the investor can elect to include the Accrued Market Discount in current interest income.
  - If the investor chooses not to include the Accrued Market Discount in current interest income, the Accrued Market Discount will be recognized in income when the bond is sold (or redeemed). In this case, if the bond is sold (or redeemed), any Price Appreciation above the Accrued OID but less than the Accrued Total Discount will be taxed as ordinary interest income; and any Price Appreciation in excess of the Accrued Total Discount will be taxed as capital gains. We'll assume in this paper that the investor chooses not to include the Accrued Market Discount in current interest income.
  - Similar to bonds issued at par or at a premium, the Accrued Market Discount for a bond with OID is computed using either the Ratable Accrual Method or the Constant Yield Method. We shall use the Constant Yield Method to compute the Accrued Market Discount throughout this paper.

Summary of tax liability on discount bonds upon sale or redemption

Assume an investor purchased a bond at a discount, and the bond is subsequently sold (or redeemed) with a Price Appreciation. Below is a summary of an investor's tax liability, if any, on the Price Appreciation upon the bond's sale (or redemption):

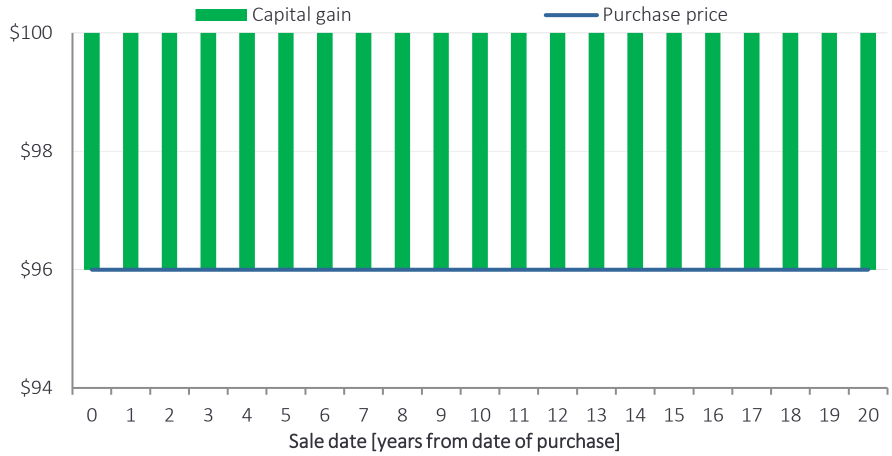
Bond issued at par or a premium

Purchased at a De Minimis Market Discount	Purchased at a Market Discount
• All Price Appreciation will be taxed as capital gains	• Portion of the Price Appreciation up to the Accrued Market Discount will be taxed as ordinary interest income • Any Price Appreciation in excess of the Accrued Market Discount will be taxed as capital gains

Bond with Original Issue Discount ("OID")

Purchased at a De Minimis Market Discount		Purchased at a Market Discount	
Price Appreciation < Accrued OID	**Price Appreciation ≥ Accrued OID**	**Price Appreciation < Accrued OID**	**Price Appreciation ≥ Accrued OID**
• The difference between the Accrued OID and the Price Appreciation is treated as a capital loss	• The amount of Price Appreciation up to the Accrued OID is tax-exempt • Any Price Appreciation in excess of the Accrued OID will be taxed as capital gains	• The difference between the Accrued OID and the Price Appreciation is treated as a capital loss	• The amount of Price Appreciation up to the Accrued OID is tax-exempt • The amount of Price Appreciation in excess of the Accrued OID but less than the Accrued Total Discount will be taxed as ordinary interest income • Any Price Appreciation in excess of the Accrued Total Discount will be taxed as capital gains

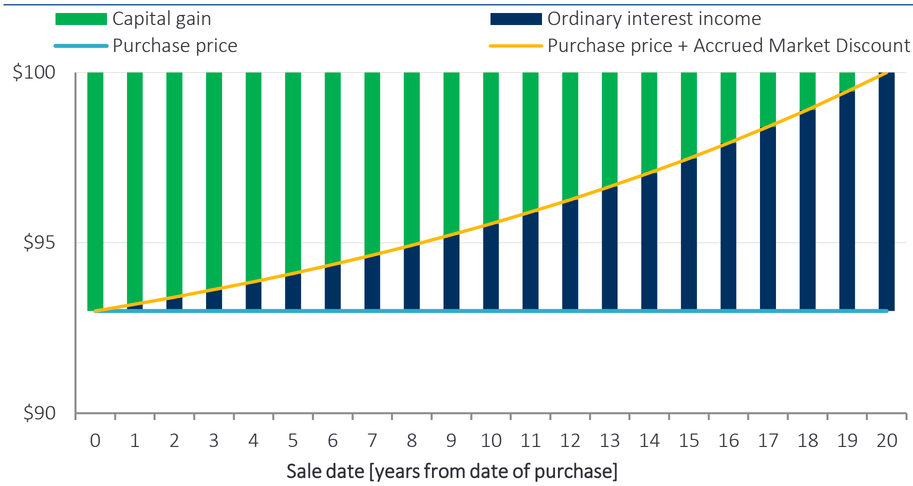
Example 1: De Minimis Market Discount taxation: issued at par or a premium



Source: FPCM

Example 1: Taxation of a bond issued at a premium, purchased at a De Minimis Market Discount. A bond with a 5% coupon and 20 years left to maturity is purchased at $96. Since the discount of $4 (= $100 - $96) is less than the Maximum Allowed De Minimis Amount of $5 (= $0.25 x 20), any Price Appreciation upon the bond's sale (or redemption) will be taxed as capital gains (the area shaded in green in Graph 1).

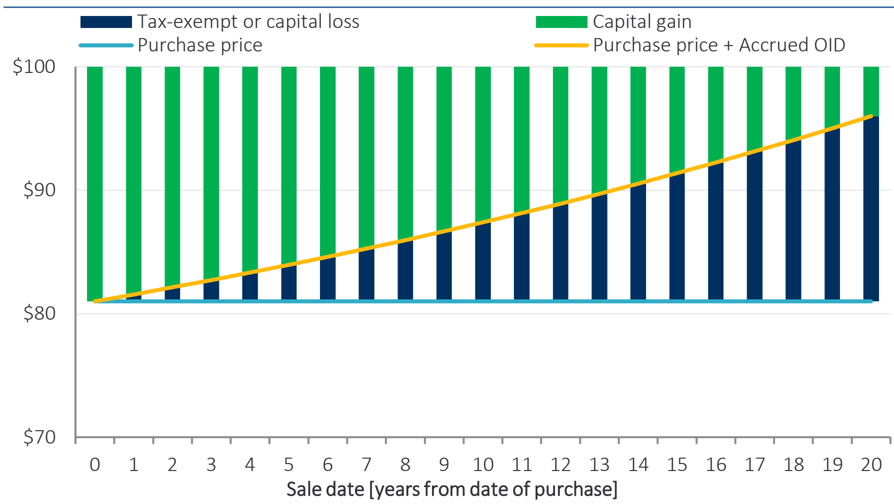
Example 2: Market Discount taxation: issued at par or a premium



Source: FPCM

Example 2: Taxation of a bond issued at a premium, purchased at a Market Discount. A bond with a 5% coupon and 20 years left to maturity is purchased at $93. Since the discount of $7 (= $100 - $93) is greater than the Maximum Allowed De Minimis amount of $5 (= $0.25 x 20), the $7 is categorized as a Market Discount. Upon the bond's sale (or redemption), the portion of Price Appreciation less than the Accrued Market Discount will be taxed as ordinary interest income (the area shaded in blue in Graph 2). Any Price Appreciation above the Accrued Market Discount will be taxed as capital gains (the area shaded in green in Graph 2).

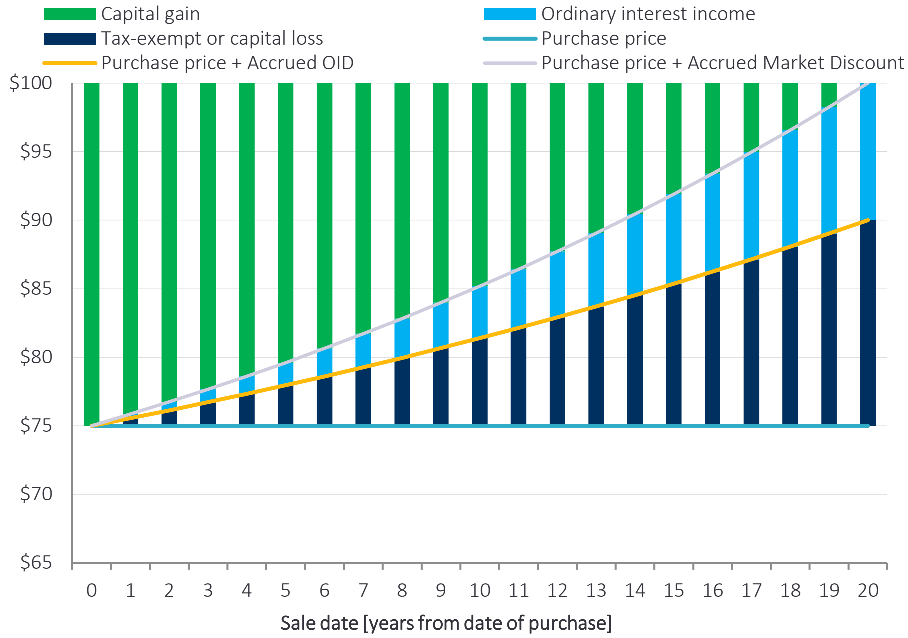
Example 3: De Minimis Market Discount taxation: OID



Source: FPCM

Example 3: Taxation of a bond with OID, purchased at a De Minimis Market Discount. A bond with 2% coupon and 20 years left to maturity was issued at $80, has an Accreted Issue Price on the purchase date of $85, and is purchased at $81. The difference between the Accreted Issue Price and the purchase price is $4 (= $85 - $81). Since $4 is less than the Maximum Allowed De Minimis Amount of $5 (= $0.25 x 20), this bond is purchased at a De Minimis Market Discount. Upon the bond's sale (or redemption), if the Price Appreciation is greater than the Accrued OID, the Accrued OID portion will be tax-exempt (the area shaded in blue in Graph 3), the remainder will be taxed as capital gains (the area shaded in green in Graph 3). If the Price Appreciation is less than the Accrued OID, the difference between the Accrued OID and the Price Appreciation will be treated as a capital loss (again, the area shaded in blue in Graph 3).

Example 4: Market Discount taxation: OID



Source: FPCM

Example 4: Taxation of a bond with OID, purchased at a Market Discount. The same bond as in Example 3 with 2% coupon and 20 years left to maturity was issued at $80, has an Accrued Issue Price on the purchase date of $85, but is purchased at $75. The difference between the Accrued Issue Price and purchase price is $10 (= $85 - $75). Since $10 is more than the Maximum Allowed De Minimis Amount of $5 (= $0.25 x 20), the bond is purchased at a Market Discount. Upon the bond's sale (or redemption), the amount of Price Appreciation up to the amount of Accrued OID is tax-exempt (the area shaded in dark blue in Graph 4); the amount of Price Appreciation that exceeds the amount of Accrued OID but is less than the Accrued Total Discount, will be taxed as ordinary interest income (the area shaded in light blue in Graph 4); and any Price Appreciation in excess of the Accrued Total Discount will be taxed as capital gains (the area shaded in green in Graph 4). If the Price Appreciation is less than the Accrued OID, the difference between the Accrued OID and the Price Appreciation will be treated as a capital loss (again, the area shaded in dark blue in Graph 4).

Impact of discount taxation on after-tax yield

If a municipal bond purchased at a discount is subject to capital gains or ordinary income tax on the discount portion, what is the impact of that taxation on the after-tax yield of the bond? This is most easily illustrated with a few examples. Below, we examine three bonds, all bought at the same yield. However, one is purchased at par, another is bought at a De Minimis Market Discount and the third is bought at a Market Discount. A comparison of the after-tax yields of these three bonds illustrates the impact of taxation on the various discounts.

Bond A: Purchased at par

Years to maturity	20
Coupon	3.00%
Purchase price	$100.00
Purchase yield	3.00%

Because Bond A is purchased at par, the investor will earn the entire 3.0% yield tax-exempt if the bond is held to maturity; so, the after-tax yield for the investor is 3.0%.

Bond B: Purchased at a De Minimis Market Discount

Years to maturity	20
Coupon	2.75%
Purchase price	$96.26
Purchase yield	3.00%

Bond B is purchased at a discount of $3.74 (= $100 - $96.26). Since $3.74 is lower than the Maximum Allowed De Minimis Amount of $5 (= 0.25% x 20), the discount is considered a De Minimis Market Discount which is exempt from ordinary income tax at maturity. However, this De Minimis Market Discount will still be subject to capital gains tax at maturity.

Assume the investor's capital gains tax rate at maturity will be 23.8%[3]. At maturity, the investor will incur a capital gains tax of $0.89 (= $3.74 x 23.8%). If we discount that tax to today using the tax-exempt yield of 3%[4], the present value of the tax equals $0.49. So, the true after-tax cost of purchasing the bond is $96.75 (= $96.26 + $0.49). This translates to an after-tax yield of 2.97%, or 0.03% more expensive than the 3% after-tax yield of Bond A.

[3] Equals the current top marginal personal capital gains rate of 20% plus 3.8% net investment income tax.
[4] Assume a flat tax-exempt yield curve of 3%. Otherwise, the 20-year zero-coupon tax-exempt yield should be used.

Bond C: Purchased at a Market Discount

Years to maturity	20
Coupon	2.50%
Purchase price	$92.52
Purchase yield	3.00%

Bond C is purchased at a discount of $7.48 (= $100 - $92.52). Since $7.48 is greater than the Maximum Allowed De Minimis Amount of $5 (= 0.25% x 20), the discount will be categorized as a Market Discount and will be taxed as ordinary interest income at maturity.

Assume the investor's marginal ordinary income tax rate at maturity will be 43.4%[5]. At maturity, the investor will incur an ordinary income tax on the entire Market Discount portion of $7.48. The tax at maturity will be $3.25 (= $7.48 x 43.4%). If we discount that tax to today using the tax-exempt yield of 3%, the present value of the tax equals $1.79. That means the true after-tax cost of purchasing the bond is $94.31 (= $92.52 + $1.79). This translates to an after-tax yield of 2.88%, which is 0.12% more expensive than the 3% after-tax yield of Bond A.

As illustrated, if a bond is purchased at a De Minimis Market Discount, there is a tax penalty associated with the capital gains tax payable at the time of sale (or redemption). The penalty is even more onerous if a bond is purchased at a Market Discount because a larger discount amount will be taxed and the tax rate will be ordinary income instead of capital gains.

Since a bond purchased at a De Minimis Market Discount or Market Discount will incur taxation at the time of sale (or redemption), when the municipal bond market sells off, the sell-off will be more severe for bonds that trade at De Minimis Market Discounts, and even more so for bonds that trade at Market Discounts, as taxation will be taken into consideration for any new investors who buy these discount bonds, and these investors will want to be compensated for this incremental tax liability they are assuming.

[5] Equals the current top marginal personal ordinary income tax rate of 39.6% plus 3.8% net investment income tax.

Glossary

"Accreted Purchase Price" means, for a bond purchased at a Total Discount, the purchase price that has accreted from the purchase date to the sale (or redemption) date using the purchase yield.

"**Accreted Issue Price"** means, for a bond with OID, the original issue price that has accreted from issue date using the original issue yield.

"Accrued Market Discount" means (1) for a bond issued at par or a premium and bought at a Market Discount, the difference between the Accreted Purchase Price and the Purchase Price; or (2) for a bond with OID, the difference between the Accrued Total Discount and the Accrued OID.

"Accrued OID" means, for a bond with OID, the Accreted Issue Price on the sale (or redemption) date minus the Accreted Issue Price on the purchase date.

"Accrued Total Discount" means the difference between the Accreted Purchase Price and the purchase price.

"Constant Yield Method" means computing the Accrued Market Discount using (1) the purchase yield for a bond issued at par or at a premium; or (2) the purchase yield and the original issue yield for a bond with OID.

"**De Minimis Market Discount"** means (1) for a bond issued at par or a premium, the Total Discount if it's less than the Maximum Allowed De Minimis Amount; or (2) for a bond with OID, the difference between the Accreted Issue Price on the date of purchase and the purchase price if the purchase price is less than the Accreted Issue Price and if the difference is less than the Maximum Allowed De Minimis Amount.

"Market Discount" means (1) for a bond issued at par or a premium, the Total Discount if it's greater than or equal to the Maximum Allowed De Minimis Amount; or (2) for a bond with OID, the difference between the Accreted Issue Price on the date of purchase and the purchase price if the purchase price is less than the Accreted Issue Price and if the difference is greater than or equal to the Maximum Allowed De Minimis Amount.

"Maximum Allowed De Minimis Amount" means one-fourth of 1% (0.25%) of the stated redemption price of the bond multiplied by the number of full years to maturity from the purchase date.

"Price Appreciation" means if the sale (or redemption) price is higher than the purchase price, the difference between the two prices.

"Ratable Accrual Method" means treating the Accrued Market Discount as equal, daily installments during the period the bond is held.

"Total Discount" means the difference between $100 and the purchase price if the purchase price is less than $100.

About the author:

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Mr. Ho received his Bachelor of Science in Applied Mathematics from Harvey Mudd College and his Ph.D. in Mathematics from Stanford University. Mr. Ho was a National Science Foundation Fellow and a Post-Doctoral Fellow at the Stanford University School of Medicine.

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