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Phase III Cost Basis Reporting: Basic Bond Math

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White Paper

Per Phase III of the Cost Basis Reporting requirements, brokers and other transfer agents must report a customer's adjusted basis for certain covered securities -- securities futures contracts, less-complex debt instruments and options -- acquired on January 1, 2014 or later. This paper focuses on the specific elements of basic bond mathematics necessary to create and / or read 1099-B, 1099-INT, and 1099-OID statements compliant with the Emergency Economic Stabilization Act of 2008 (H.R. 1424 or EESA), which introduced these reporting requirements.

We focus on long-term debt issued in 1985 or onward and cover basic or non-OID (Original Issue Discount) and OID bonds. This paper includes many examples that increase in complexity incrementally. It also includes a spreadsheet that details how each example is calculated.

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Introduction

Individual taxpayers have always had to report cost basis data (gains, losses, and income from purchases and sales of securities) to the IRS. The Emergency Economic Stabilization Act of 2008 (H.R. 1424 or EESA) ushered in a new era of tax reporting requirements. Now brokers must also report these figures, to both their customers (i.e., taxpayers) and the IRS. Although the EESA was passed in 2008, the Cost Basis Reporting requirements it introduced were so complex that these regulations were broken up into three phases and rolled out over time. Phase I included equities, Phase II included mutual funds and ETFs and Phase III requires cost basis reporting for options, securities futures contracts, and less-complex debt acquired on or after January 1, 2014.

In order to accurately comply with Phase III, brokers and taxpayers must calculate complex basis adjustments for fixed income (bonds). The mathematics behind these calculations is highly complex and a subject worthy of many white papers. This paper focuses on the specific elements of bond mathematics necessary to create and / or read 1099-B, 1099-INT, and 1099-OID statements compliant with EESA 2008. We also focus on long-term debt issued in 1985 or onward. This paper includes examples that increase in complexity incrementally, so it is vital that the reader understand each example before moving on to the next one. This paper also includes G2FT Basic Bond Math Spreadsheet, an Excel spreadsheet that details how each example is calculated. Please feel free to refer to the spreadsheet to help you understand the underlying computations.

The main vehicle of implementation for Phase III is the fleshing out of §1.6045-1(n), first published by the IRS as TD 9616 on May 13, 2013. This new paragraph brings together several regulations on reporting for bonds.

We point out that a taxpayer can avoid or delay making these computations for a bond until the time of disposition of that bond, if:

1. The bond has no OID and is purchased at par; or
2. The Market Discount or OID is very small and below the de minimis threshold; or
3. The taxpayer has elected to not amortize bond premium and to delay recognition of market discount until time of disposition.

Frequently, however, the taxpayer will find himself in possession of bonds that do not fulfill any of the above conditions. Therefore a knowledge of bond math is helpful. Also in case 3, a taxpayer should know bond math so that he is better informed to make such elections. The broker has to support a taxpayer's election. So as long as the broker has at least one taxpayer requiring reporting on bonds, the broker needs to know bond math.

Phase III does offer one relief to brokers: A broker does not have to report for a bond with a maturity of less than one year at the time of issuance, regardless of a taxpayer's election.

Section 1: Computing Yield and Accrual Period

Before we delve further, let us discuss the mechanics of computing yield. What is a yield? In common parlance, "yield" means the expected annual return on investment (ROI) for a taxpayer buying a bond at a certain price at a certain time. There are several mechanisms for computing yield, but in the usual context of bond math and this paper, "yield" refers to yield-to-maturity. This computation defines yield as the annualized discount rate that makes the sum of all cash-flows from a bond equal to zero. This number is usually readily available from the broker or any accounting system. If necessary, a taxpayer can also calculate the yield with the help of an Excel spreadsheet.

Other yield computations include yield-to-call and yield-to-put for bonds with call and put schedules. These need to be considered for bonds that have option features or contingencies. This paper will not cover these more advanced topics.

While yield is always described on an annualized basis, the numeric value of a yield depends on how frequently the yield is compounded. This is best explained by an example.

Example 1: How accrual period affects the computation of yield
A zero-coupon bond is issued on 01/01/2001 at 80 and matures at 100 on 12/31/2010. What is the yield? The yield depends on the accrual period, which determines the frequency of the compounding. Table 1 summarizes the accrual period and the yield it produces.

Table 1 – Accrual period and the yield it produces

Accrual (Compounding) Period	Equation to Solve	Yield
1 year	80*(1+y)^10 = 100	2.2565%
6 months	80*(1+y/2)^20 = 100	2.2439%
3 months	80*(1+y/4)^40 = 100	2.2377%
1 month	80*(1+y/12)^120 = 100	2.2335%
1 day (assuming 30/360)	80*(1+y/360)^3600 = 100	2.2315%

The IRS allows the taxpayer some flexibility in determining which accrual period to use for computing yield. For now, we assume our bonds have coupons paid semi-annually and we use the six months between each payment as the accrual period. We discuss this in more detail in Section 3, OID Bonds.

In practice, a taxpayer rarely buys a bond at par. When the purchase price is not exactly par, the taxpayer incurs imputable interest (positive or negative) on which he may have to pay tax or which he can use to offset tax obligations. In general, the taxpayer is allowed one of two ways to compute that interest: Constant Yield and Ratable Accrual.

Imputed Interest

When a bond is purchased at a price other than par, the tax code forces the taxpayer to sooner or later recognize an imputed interest amount derived from the difference between acquisition price and disposition price. When the imputable interest is positive, the process is called accretion; when the imputable interest is negative, the process is called amortization; and the more generic term "accrual" can be used to mean either. A powerful side effect of accrual is that the basis of the bond is made to converge to its eventual maturity price as the imputable interest is accrued. There are two mechanisms for computing this imputed interest.

Constant Yield Accrual Method

So, why is **yield** important? It is important because the "Constant Yield" method for calculating this interest requires a value for yield. Formulaically:

- In the first accrual period,

$$Accrual = Purchase\ Price * \left(\frac{YTM}{Accrual\ periods\ per\ year}\right) - Coupon$$

- At the end of the first period, the bond's basis is now Purchase Price + Accrual.

- In subsequent periods,

$$Accrual = Last\ Period's\ Basis * \left(\frac{YTM}{Accrual\ periods\ per\ year}\right) - Coupon$$

We point out that these formulae are true for the scope of this paper, which is BASIC bond math. For now we assume a 6-month accrual period, which explains why we always divide the yield by two. When we reach Section 3, OID Bonds, we will delve deeper into variations of Constant Yield. The following example will help.

Example 2: Various examples of constant yield accrual
Example 2A: A semi-annual 5% coupon bond is issued on 01/01/2001 at par and matures on 12/31/2011. Coupons are paid on 06/30 and 12/31 each year. A taxpayer buys $1,000 face value of the bond at issue. The coupon is the yield and this is generally true for fixed-coupon, regularly scheduled bonds purchased at par. Using constant yield accrual, the accrual for the first 6-month is: $1000 * (5%/2) - $25 = $0. In all subsequent periods, the accrual is still $0. So on and so forth. Intuitively, a bond purchased at face value has $0 accrual.

Example 2B: A semi-annual 5% coupon bond is issued on 01/01/2001 at par and matures on 12/31/2010. Coupons are paid on 06/30 and 12/31 each year. A taxpayer purchases $1,000 face value of the bond at 105 (clean price) on 01/01/2006. The yield is 3.8899% and here is the equation we used to calculate it.

$$\frac{2.5}{(1+{}^{y}/_{2})^{1}} + \frac{2.5}{(1+{}^{y}/_{2})^{2}} + \frac{2.5}{(1+{}^{y}/_{2})^{3}} + \cdots + \frac{2.5}{(1+{}^{y}/_{2})^{20}} - 105 = 0$$

In the first 6 month, the accrual is 3.8899%/2 * $1050 - $25 = -$4.58. In the second 6 month, the accrual is 3.8899%/2 * ($1050-4.58) - $25 = -$4.67. So on and so forth. Intuitively, a bond purchased at a premium has a negative accrual; in other words, the basis amortizes.

Example 2C: A semi-annual 5% coupon bond is issued on 01/01/2001 at par and matures on 12/31/2010. Coupons are paid on 06/30 and 12/31 each year. A taxpayer purchases $1,000 face value of the bond at 95 (clean price) on 01/01/2006. The yield is 6.1776% and here is how we calculated it.

$$\frac{2.5}{(1+{}^{y}/_{2})^{1}} + \frac{2.5}{(1+{}^{y}/_{2})^{2}} + \frac{2.5}{(1+{}^{y}/_{2})^{3}} + \cdots + \frac{2.5}{(1+{}^{y}/_{2})^{20}} - 95 = 0$$

In the first 6 month, the accrual is 6.1776%/2 * $950 - $25 = $4.34. In the second 6 month, the accrual is 6.1776%/2 * ($950+4.34) - $25 = $4.48. So on and so forth. Intuitively, a bond purchased at a discount has a positive accrual; in other words the basis accretes.

In the simplest case, the accrual periods coincide with the tax year. For example, accrual periods of 01/01 to 06/30 and 07/01 to 12/31 for a semiannual bond or accrual periods of 01/01 to 12/31 for an annual bond. But realistically, the accrual period does not coincide so perfectly. In that case, the taxpayer must convert the accrual to a daily accrual number and multiply it by the days held.

Example 3: Converting from accrual periods to the tax year
A semi-annual 5% coupon bond is issued on 04/01/2001 at par and matures on 03/31/2010. Coupons are paid on 09/30 and 03/31 each year. A taxpayer purchases $1,000 face value of the bond at 105 (clean price) on 04/01/2006. The yield is the same 3.8899% from Example 2. What is the accrual for the tax years?

In the first 6 month, the accrual is 3.8899%/2 * $1050 - $25 = -$4.58. In the next 6 month, the accrual is 3.8899%/2 * ($1050-$4.58) - $25 = -$4.67. So on and so forth. In Table 3A, the accrual at the end of each of the 10 six-month accrual periods is listed. Note they sum to ($50). The Days in Accrual Period is the simple day count. The only exception is that the purchase date of 04/01/2006 is not counted, hence the first "Days in Period" is 182, not 183. The Daily Accrual is just the Accrual divided by the Days in Period.

Table 3A – Accrual period and daily accrual

Period Ending	Basis at Period End	Accrual	Days in Period	Daily Accrual
Beginning Basis	1,050			
9/30/2006	1,045	(4.58)	182	(0.0252)
3/31/2007	1,041	(4.67)	182	(0.0256)
9/30/2007	1,036	(4.76)	183	(0.0260)
3/31/2008	1,031	(4.85)	183	(0.0265)
9/30/2008	1,026	(4.94)	183	(0.0270)
3/31/2009	1,021	(5.04)	182	(0.0277)
9/30/2009	1,016	(5.14)	183	(0.0281)
3/31/2010	1,011	(5.24)	182	(0.0288)
9/30/2010	1,005	(5.34)	183	(0.0292)
3/31/2011	1,000	(5.44)	182	(0.0299)

When the accrual periods and the tax years do not coincide, the taxpayer converts from one to the other using daily accrual as the bridge (which is itself an application of ratable accrual). The Daily Accrual is multiplied by the corresponding days in a tax year to arrive at a tax year accrual. For instance, as you will see in Table 3B, in 2006, the taxpayer covers two accrual periods: 04/01 to 09/30, which has 182 days with a daily accrual of -$0.0252, for a total of -$4.58; and 10/01 to 12/31, which has 92 days with a daily accrual of -$0.0256, for a total of -$2.36. The 2006 total is -$4.58-$2.36 = -$6.94. The sum is also ($50), within rounding.

Table 3B – Tax-year accrual

	1/1 to /31		4/1 to 9/30		10/1 to 12/31		1/1 to 3/31
Tax Year	Days	Daily Accrual	Days	Daily Accrual	Days	Daily Accrual	Total
2006			182	(0.0252)	92	(0.0256)	(6.94)
2007	90	(0.0256)	183	(0.0260)	92	(0.0265)	(9.50)
2008	91	(0.0265)	183	(0.0270)	92	(0.0277)	(9.90)
2009	90	(0.0277)	183	(0.0281)	92	(0.0288)	(10.28)
2010	90	(0.0288)	183	(0.0292)	92	(0.0299)	(10.68)
2011	90	(0.0299)					(2.69)

A note on the unit for expressing the daily accrual number: If you've seen a Publication 1212 table, you might have seen "Daily OID" (see Example 7). That value is expressed as "$ per $1000 of maturity value per day." In our examples, the daily value is already computed using the face value purchased, so the unit for our numbers such as (0.0252) in the first period is in "actual $ per day."

Ratable Accrual

The counterpart to the constant yield accrual is the ratable accrual. This is a linear method *and does not require a value for yield*. If a taxpayer has $X of market discount, premium, or OID over Y remaining years, then each year the taxpayer accrues X/Y. For example, a bond with $6 in market discount with 12 years remaining to maturity would accrue $0.50 in market discount each tax year.

Constant yield accrues a smaller absolute number in the early years than in the later years. This is generally more advantageous from a tax point of view. See Example 4.

One might think that this easy mechanism is preferable for computing yield due to the simplicity of the math, but it is less desirable to the taxpayer in some cases (see Example 6), and in others it is simply disallowed by the tax code.

Section 2: Basic (Non-OID) Bonds

The term bond, when used without any modifier, generally means a debt instrument that

1. Issued at a price that is equal to the maturity price, typically 100
2. Pays a fixed coupon on a regular schedule, typically semi-annually
3. Pays the principal on the maturity day.

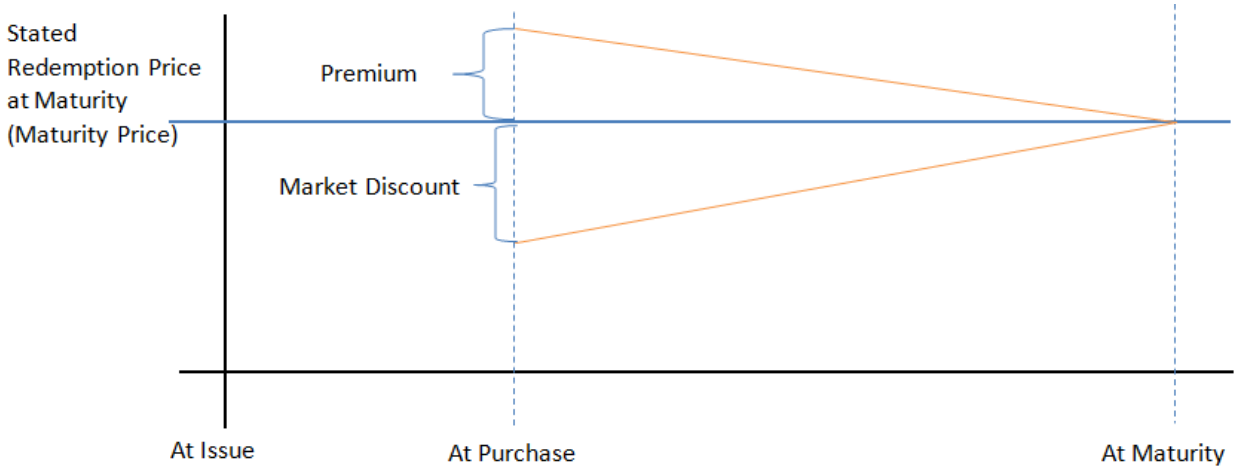
Coupons are also generally "qualified stated interest" or QSI. This means that these coupons are paid unconditionally at least once a year at a fixed rate. Payments that are variable rate or irregular are not QSI. For example, a coupon linked to LIBOR or pays out on a blue moon is not considered QSI. In this paper, coupons and QSI are interchangeable. It is important to point out QSI because that term is used in IRS regulations. Given the basic scope of this paper, we use the two terms interchangeably. We use "coupon" when describing the characteristics of a bond and "QSI" when computing bond basis.

However, QSI and interest income are not the same. QSI is a subset of interest income. Interest income includes imputable interest, which for the purposes of this paper includes the accretion of market discount and OID (original issue discount). Interest income is offset by amortization of premium and acquisition premium. And interest income is taxed as ordinary income.

When a bond is purchased at a price that deviates from the issue price, it generates either a premium or a market discount and can fall into 1 of 3 scenarios depending on its purchase price. See Graph 1.

1. **Purchase Price < Maturity Price**. *Market discount.* The investor may elect to include or exclude market discount on an annual basis.
2. **Purchase Price = Maturity Price**. *Par*. In this case, the bond has neither premium nor market discount.
3. **Maturity Price < Purchase Price**. *Premium*. The investor may elect to include or exclude on an annual basis.

Graph 1 – Non-OID Bond



Purchases and Sales between Coupon Dates

Bonds are traded in large volume on a daily basis in the secondary market. When a bond is sold on a day other than the ex-coupon date, the bond has accrued interest for which the buyer must compensate the seller. This "purchased" accrued interest is part of the purchase price of the bond, but is not considered part of the cost basis and is therefore ignored for purposes of amortization. Instead, the "clean" price (the price of the bond without consideration for partial coupons) is used for amortization. Similarly, the price including the purchase interest is called the "dirty" price. The accrued interest is an expense for the buyer and ordinary income for the seller.

In practice, the buyer pays the accrued interest on a pro-rata period based on the days since the prior coupon payment. The exact formula for determining this pro-rata "purchase" interest can vary from bond to bond and depends heavily on the day-count convention. The issuer of the bond decides which convention is used so as to avoid disputes between buyers and sellers. Some examples of day count conventions are actual/actual or 30/360. For this paper, we assume actual/actual in our examples because it is one of the easier formulas to explain.

Example 4: A sale occurring between coupon dates
A 2% semiannual coupon bond is issued on 04/01/2001 at 100, maturing at 100 on 03/31/2011. Coupons are paid on 09/30 and 03/31 each year. A taxpayer buys $100,000 face value of the bond at par on 01/01/2002. What is the price that the investor must pay?

The previous coupon was paid on 09/30/2001 and a total of 93 days have passed to reach 01/01/2002. From 09/30/2001 to the next coupon date of 03/31/2002 is 182 days. The purchase day of 09/30/2001 is excluded. Thus the accrued interest is (93/182) * (2%)/2 * $100,000 = $510.99. Since the bond is purchased at par, the final price is $100,000 + $510.99 = $100,510.99. The price including the accrued interest is known as the dirty price (e.g., $100,510.99); the price excluding the accrued interest is the clean price (e.g., $100,000).

For the seller, the $510.99 is treated as an interest income. However, for the buyer, the treatment is more complicated.

Example 4A: The bond is sold prior to the next coupon
The buyer sells the bond at 101 clean price on 2/1/2002. What is the tax liability for 2002? A total of 123 days have passed from 9/30/2001 to 2/1/2002. The accrued interest is (124/182)*(2%)/2 * $100,000 = $681.32. The basis is $100,510.99 and the sale price is $101,681.32. The total profit is 1,170.33 and the breakdown for the 2002 tax year is:

$170.33	Interest Income, the $681.32 he received minus the $510.99 he paid
$1,000.00	Capital Gain

Example 4B: The bond is held beyond the next coupon
The buyer sells the bond at 101 clean price on 06/01/2002. What is the tax liability for 2002? On 04/01/2002, the buyer receives $1,000 in coupon. He treats $510.99 as a return of capital and the remaining $489.01 as interest income. His basis in the bond is now $100,000. When the sale occurs on 06/01/2002, a total of 62 days has passed from 03/31/2002 to reach 06/01/2002. From 06/01/2002 to the next coupon date of 10/01/2002 is 183 days. The accrued interest is (62/183)*(2%)/2 * $100,000 = $338.80. The basis is $100,000 (the clean price you bought at) and the sale price is $101,338.83. The total profit is $1,827.84 and the breakdown for the 2002 tax year is:

$827.81	Interest Income, the ($1000+$338.80) he received minus the $510.99 he paid
$1,000.00	Capital Gain

The important difference is that the basis is at $100,510.99 (dirty price) prior to the next coupon payment, but drops to $100,000 (clean price) after. In subsequent examples, you will see we use the dirty price as the basis to accrue prior to the first coupon payment, but revert to the clean price thereafter. We now move on to accounting items that can affect a bonds basis, namely premium and market discount.

Premium Computation

Premium occurs when a bond is purchased at a price above the maturity price. So if a bond matures at 100, any acquisition price above 100 would generate a premium. A taxpayer holding a taxable bond may choose to recognize amortized premium on an annual basis or upon disposal. If the investor recognizes on an annual basis (aka amortizes premium), he or she must use the constant yield method (ratable accrual is not permitted). The amortized premium reduces the recognized amount of QSI for that bond for that year, and also reduces the basis of the bond by a commensurate amount. If the premium is not recognized on an annual basis, the investor does not recognize the income-reducing benefit until disposal. He or she maintains the higher basis in the bond that will reduce the capital gain of a future sale, redemption, or maturity.

For a non-taxable bond, the investor must amortize the premium, even though the only purpose of that amortized premium is to reduce the basis in the bond.

The formulae are

- In the first accrual period,

$$Amortized\ Permium = Purchase\ Price * \left(\frac{YTM}{Accrual\ periods\ per\ year}\right) - QSI$$

- At the end of the first period, the bond's basis is now Purchase Price + Amortized Premium.

- In subsequent periods,

$$Amortized\ Permium = Last\ Period's\ Basis * \left(\frac{YTM}{Accrual\ periods\ per\ year}\right) - QSI$$

Note we use QSI, instead of Coupon. This is the more accurate usage.

Example 5: Purchasing a bond with market premium
A 2% semiannual coupon bond is issued on 04/01/2001 at 100, maturing at 100 on 03/31/2011. Coupons are paid on 09/30 and 03/31 each year. A taxpayer buys $100,000 face value of the bond on 01/01/2002 for 102.511 dirty price, or 102 clean price. What does the annual premium amortization look like? The 0.511 is the accrued interest (rounded) and comes from the previous example, Example 4.

The computation for premium amortization requires yield-to-maturity, which is 1.7633%. We then determine the amortized premium for each period. In all periods but the first period, the QSI is $1000. In the first period, the QSI is $489 and that is because $511 (income) is treated as a return of capital from when the taxpayer bought the bond, bringing the basis from $102,511 to $102,000 clean price. Only the remaining $489 is considered the QSI.

In the first period, the taxpayer only held the bond for three months, which is a quarter of a year. Thus we scale the 1.7899%, annualized yield, down by 4. Thus Amortized Premium = $102511* (1.7633% / 4) - $489 = -$37 and the end basis is $102,000 - $37. But in subsequent periods, Amortized Premium = Begin Basis * (1.7633% / 2) - QSI. The Begin Basis = Prior Begin Basis + Amortized Premium. For tax purposes, we need a Daily Premium column, which is the Amortized Premium divided by Day count. See Table 5A. Note the total Amortized Premium sums to ($2000).

Table 5A – Accrual-period premium amortization

	Begin Basis	QSI	Amortized Premium	End Basis	Days Held	Daily Premium
1/1/2002 to 3/31/2002	102,511	489	(37)	101,963	89	(0.4170)
4/1/2002 to 9/30/2002	101,963	1,000	(101)	101,862	183	(0.5522)
10/1/2002 to 3/31/2003	101,862	1,000	(102)	101,760	182	(0.5601)
4/1/2003 to 9/30/2003	101,760	1,000	(103)	101,657	183	(0.5619)

Table 5A – Accrual-period premium amortization *(continued)*						
	Begin Basis	QSI	Amortized Premium	End Basis	Days Held	Daily Premium
10/1/2003 to 3/31/2004	101,657	1,000	(104)	101,553	183	(0.5669)
4/1/2004 to 9/30/2004	101,553	1,000	(105)	101,449	183	(0.5719)
10/1/2004 to 3/31/2005	101,449	1,000	(106)	101,343	182	(0.5801)
4/1/2005 to 9/30/2005	101,343	1,000	(107)	101,237	183	(0.5820)
10/1/2005 to 3/31/2006	101,237	1,000	(107)	101,129	182	(0.5904)
4/1/2006 to 9/30/2006	101,129	1,000	(108)	101,021	183	(0.5923)
10/1/2006 to 3/31/2007	101,021	1,000	(109)	100,911	182	(0.6008)
4/1/2007 to 9/30/2007	100,911	1,000	(110)	100,801	183	(0.6028)
10/1/2007 to 3/31/2008	100,801	1,000	(111)	100,690	183	(0.6081)
4/1/2008 to 9/30/2008	100,690	1,000	(112)	100,578	183	(0.6135)
10/1/2008 to 3/31/2009	100,578	1,000	(113)	100,464	182	(0.6223)
4/1/2009 to 9/30/2009	100,464	1,000	(114)	100,350	183	(0.6244)
10/1/2009 to 3/31/2010	100,350	1,000	(115)	100,235	182	(0.6333)
4/1/2010 to 9/30/2010	100,235	1,000	(116)	100,118	183	(0.6354)
10/1/2010 to 3/31/2011	100,118	1,000	(118)	100,001	182	(0.6445)

The premium in the final period is whatever number is needed to ensure the basis ends at $100,000, the maturity value.

Now convert from period amortized premium to tax year amortized premium. This conversion is based on summing the Daily Premium. See Table 5B.

Table 5B – Tax-year premium amortization							
Tax Year	Days in Jan to Mar	Daily Premium	Days in Apr to Sep	Daily Premium	Days in Oct to Dec	Daily Premium	Tax Year Premium
2002	89	(0.4170)	183	(0.5522)	92	(0.5601)	(190)
2003	90	(0.5601)	183	(0.5619)	92	(0.5669)	(205)
2004	91	(0.5669)	183	(0.5719)	92	(0.5801)	(210)
2005	90	(0.5801)	183	(0.5820)	92	(0.5904)	(213)
2006	90	(0.5904)	183	(0.5923)	92	(0.6008)	(217)
2007	90	(0.6008)	183	(0.6028)	92	(0.6081)	(220)
2008	91	(0.6081)	183	(0.6135)	92	(0.6223)	(225)
2009	90	(0.6223)	183	-0.6235	92	(0.6333)	(228)
2010	90	(0.6333)	183	-0.6345	92	(0.6509)	(233)
2011	90	(0.6509)					(59)

The number of days in the very first 3 months of 2002 is 89, because the purchase day of 01/01 does not count for holding period calculation. The $(190) is 89*($0.4170) + 183*($0.5522) + 92*($0.5601). The investor can use the annual premium to reduce the taxable QSI of $2000 a year that he or she receives on this bond. As a sanity check, note that the sum of Tax Year Premium is ($2000).

Market Discount Computation

For a non-OID bond, market discount occurs when it is purchased at a price below the maturity price. If a non-OID bond matures at 100, any acquisition price below 100 would generate a market discount. A taxpayer may use either ratable accrual or constant yield accrual to accrue market discount. A taxpayer may recognize the market discount on an annual basis, in which case the accreted market discount is treated like interest income annually and increases the basis of the bond. In the year a bond is sold, the investor must recognize the accrued market discount for the partial year.

Alternatively, the investor may delay recognition until the time of disposition. Note the distinction between recognize and accrue: The taxpayer must always accrue for market discount, but may elect to recognize at disposition. At disposition, any gain up to the market discount accrued to the time of disposition is still treated as interest income; only the excess, if any, is treated as capital gain (See Example 16). This is an important rule. In a world where market discount (and OID) were treated as capital gain, with its lower tax rate, then all bonds would be issued at a discount (aka as OID bonds) to allow the interest income to be taxed as long-term capital gain.

The taxpayer may accrete discount using ratable or constant yield accrual. The formulae for constant yield are

- In the first accrual period,

$$Accreted\ Discount = Purchase\ Price * \left(\frac{YTM}{Accrual\ periods\ per\ year}\right) - QSI$$

- At the end of the first period, the bond's basis is now Purchase Price - Accreted Discount.

- In subsequent periods,

$$Accreted\ Discount = Last\ Period's\ Basis * \left(\frac{YTM}{Accrual\ periods\ per\ year}\right) - QSI$$

The IRS allows a taxpayer to ignore market discounts if it is below a certain threshold. If the market discount is less than 0.25% per year of the maturity price multiplied by the number of whole years remaining until maturity, the taxpayer may treat the bond as if it had no market discount. This is called the *de minimis* rule.

Example 6: Purchasing a bond with market discount
A 2% semiannual coupon bond is issued on 04/01/2001 at 100, maturing at 100 on 03/31/2011. Coupons are paid on 09/30 and 03/31 each year. A taxpayer buys $100,000 face value of the bond on 01/01/2002 for 80.511 dirty price / 80 clean price. What does the annual market discount accretion look like under ratable accrual? Constant yield accrual?

Ratable Accrual
Under ratable accrual, the market discount is accrued in direct proportion to the days held. From 01/01/2002 to 03/31/2011 is a period of 3376 days (01/01/2002 is excluded for holding period calculation). The total amount of market discount is $20,000. We get the daily market discount by $20000/3376 = $5.924171. Multiply this by the number of days in a tax year to get the market discount for that year. See Table 6A.

Table 6A – Ratable accrual

Tax Year	Days Held	Market Discount
2002	364	2,156
2003	365	2,162
2004	366	2,168
2005	365	2,162
2006	365	2,162

Table 6A – Ratable accrual *(continued)*		
Tax Year	**Days Held**	**Market Discount**
2007	365	2,162
2008	366	2,168
2009	365	2,162
2010	365	2,162
2011	90	533

Constant Yield Accrual

Under constant yield, we must calculate the yield-to-maturity (YTM), which is 4.6877%. We then determine the accreted discount for each period. In all periods but the first period, the QSI is $1000. In the first period, the QSI is $489 and that is because $511 (income) is treated as a return of capital from when the taxpayer bought the bond, bringing the basis from $82,511 to $82,000 clean price. Only the remaining $489 is considered the QSI.

In the first period, the taxpayer only held the bond for 3 months, which is a quarter of a year. Thus we scale the 4.6877%, annualized yield, down by 4. Thus Accreted Discount = $82511* (4.6877% / 4) - $489 = $455 and the end basis is $82,000 + $455. But in subsequent periods, Amortized Premium = Begin Basis * (4.6877% / 2) - QSI. The Begin Basis = Prior Begin Basis + Amortized Premium. For tax purposes, we need a Daily Premium column, which is the Amortized Premium divided by Day count. See Table 6B.

Table 6B – Accrual period discount						
	Begin Basis	**QSI**	**Accrued Discount**	**End Basis**	**Days Held**	**Daily Discount**
1/1/2002 to 3/31/2002	80,511	489	455	80,455	89	5.1069
4/1/2002 to 9/30/2002	80,455	1,000	886	81,340	183	4.8400
10/1/2002 to 3/31/2003	81,340	1,000	906	82,247	182	4.9807
4/1/2003 to 9/30/2003	82,247	1,000	928	83,174	183	5.0696
10/1/2003 to 3/31/2004	83,174	1,000	949	84,124	183	5.1884
4/1/2004 to 9/30/2004	84,124	1,000	972	85,096	183	5.3100
10/1/2004 to 3/31/2005	85,096	1,000	995	86,090	182	5.4643
4/1/2005 to 9/30/2005	86,090	1,000	1,018	87,108	183	5.5619
10/1/2005 to 3/31/2006	87,108	1,000	1,042	88,150	182	5.7235
4/1/2006 to 9/30/2006	88,150	1,000	1,066	89,216	183	5.8256
10/1/2006 to 3/31/2007	89,216	1,000	1,091	90,307	182	5.9949
4/1/2007 to 9/30/2007	90,307	1,000	1,117	91,424	183	6.1019
10/1/2007 to 3/31/2008	91,424	1,000	1,143	92,566	183	6.2449
4/1/2008 to 9/30/2008	92,566	1,000	1,170	93,736	183	6.3913
10/1/2008 to 3/31/2009	93,736	1,000	1,197	94,933	182	6.5771
4/1/2009 to 9/30/2009	94,933	1,000	1,225	96,158	183	6.6944
10/1/2009 to 3/31/2010	96,158	1,000	1,254	97,412	182	6.8890
4/1/2010 to 9/30/2010	97,412	1,000	1,283	98,695	183	7.0119
10/1/2010 to 3/31/2011	98,695	1,000	1,305	100,000	182	7.1701

The discount in the final period is whatever number is needed to ensure the basis ends at 100,000, the maturity value.

Now convert from period accreted discount to tax year accreted discount. The mechanics are the same as for Premium. See Table 6C.

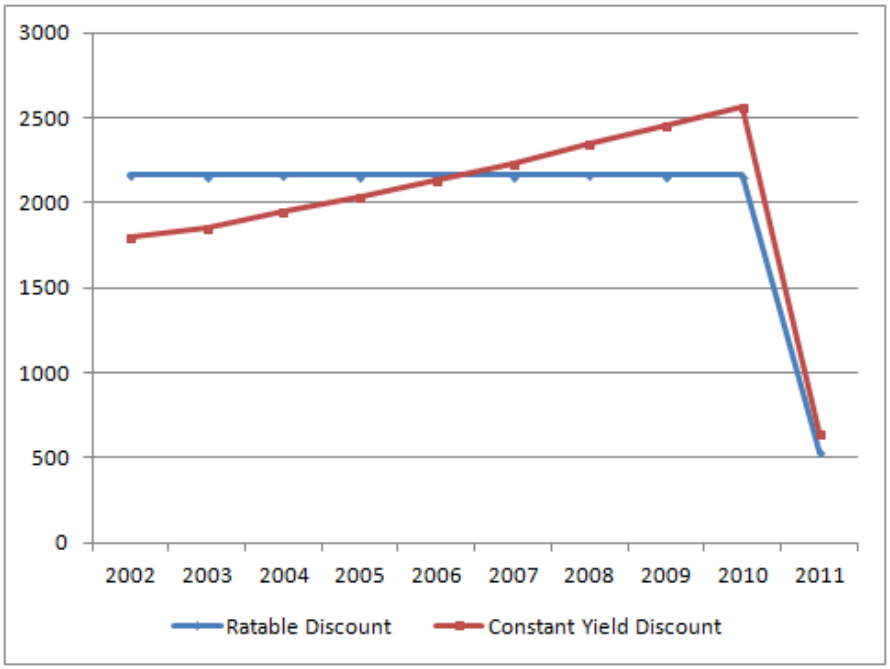
Table 6C – Tax-year discount

Tax Year	Days in Jan-Mar	Daily Discount	Days in Apr-Sep	Daily Discount	Days in Oct-Dec	Daily Discount	Tax Year Discount
2002	89	5.1069	183	4.8400	92	4.9807	1,798
2003	90	4.9807	183	5.0696	92	5.1884	1,853
2004	91	5.1884	183	5.3100	92	5.4643	1,947
2005	90	5.4643	183	5.5619	92	5.7235	2,036
2006	90	5.7235	183	5.8256	92	5.9949	2,133
2007	90	5.9949	183	6.1019	92	6.2449	2,231
2008	91	6.2449	183	6.3913	92	6.5771	2,343
2009	90	6.5771	183	6.6944	92	6.8890	2,451
2010	90	6.8890	183	7.0119	92	7.1701	2,563
2011	90	7.1701					645

The number of days in the very first 3 months of 2002 is 89, because the purchase day of 01/01 does not count for holding period calculation. The $1798 is 89*$5.1069 + 183*$4.8400 + 92*$4.9807. The taxpayer can recognize the annual discount, in which case the basis in the bond is increased. The taxpayer can also delay recognition until disposition (e.g., sale or maturity). However, any gain up to the accreted market discount for that holding period is still taxed as interest income. See Example 16. As a sanity check, note that the sum of Tax Year Discount is ($2000).

Graph 2 is a plot of the annual discount using ratable vs constant yield. Note that constant yield recognizes less at the beginning and more at the end. Thus constant yield accrual is generally more advantageous from a tax point of view.

Graph 2 – Annual discount using ratable vs constant yield accrual



Section 3: OID Bonds

An OID bond is a bond where the issue price is less than the maturity price. OID bonds are created by issuers in order to reduce the mandatory coupon payments that are obligated by the bond. In essence, the issuer is saddled with less interest paid during the lifetime of the bond but offset by needing to pay more at maturity. Many OID bonds have no coupons at all and deliver all their interest at maturity. A common example of this kind of "zero coupon" bond is a U.S. Treasury Bill. However, coupons paid by an OID bond, if any, are still generally QSI, just as is the case for non-OID bonds.

In order to perform the bond math for an OID bond, one needs two important sets of data: the key dates and the key prices. The key dates for an OID bond are the issue date, purchase date, and maturity date. The key prices are the maturity (or redemption) price and issue price.

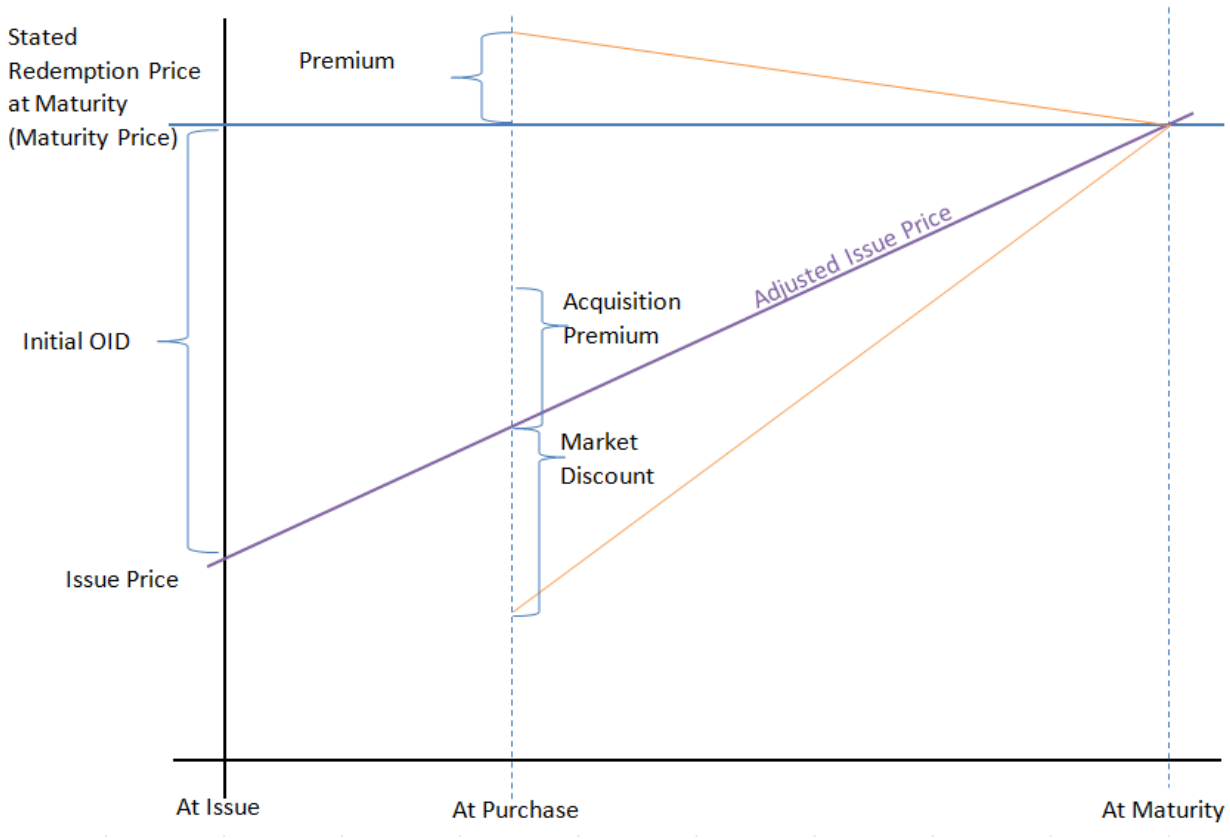
In addition to these key static pieces of information, after the time of issue, there exists an adjusted issue price for any OID bond. This is a computable price that accounts for the OID accrued since the time of issue. At the time of issue, the adjusted issue price is equal to the issue price. For all subsequent periods, the adjusted issue price is the adjusted price at the start of the period increased by the amount of OID accrued for that period. At maturity, the adjusted issue price converges to the maturity price. When an OID bond is purchased for a price that is between the adjusted issue price (on the date of the purchase) and the maturity price, that bond has acquisition premium; if purchased below the adjusted issue price, the bond has market discount. A non-OID bond never has acquisition premium.

If an OID bond is purchased with premium (*not* merely acquisition premium), then the OID bond does not accrue any OID.

An OID bond can fall into exactly 1 of 5 scenarios depending on its purchase price relative to the maturity price and adjusted issue price. See Graph 3

1. **Purchase Price < Adjusted Issue Price < Maturity Price**. *Market discount*. The bond has OID and market discount. The investor must accrue for the OID but may elect to include or exclude market discount on an annual basis.
2. **Purchase Price = Adjusted Issue Price < Maturity Price**. *Purchase at (adjusted) issue.* Most commonly, the OID bond was bought at the issue price when it was issued. Subsequently and less likely, the OID bond may be bought at its adjusted issue price. This is also the border case between "market discount" and "acquisition premium." The bond only has OID and must accrue for this OID.
3. **Adjusted Issue Price < Purchase Price < Maturity Price**. *Acquisition Premium*. The bond has OID and acquisition premium. The investor must accrue for both. Acquisition premium offsets OID.
4. **Adjusted Issue Price < Purchase Price = Maturity Price**. *Purchase at Maturity price*. In this case, the bond has no OID, premium, acquisition premium, or market discount. This is also the border case between "acquisition premium" and "premium."
5. **Adjusted Issue Price < Maturity Price < Purchase Price**. *Premium*. The bond is treated as non-OID. Please refer to Section 2, Basic (Non-OID) Bonds.

Graph 3 – OID Bonds



OID and acquisition premium must always be accrued and reported. However, a taxpayer may elect to include or exclude premium or market discount. List 1 summarizes this reporting.

List 1 – Reporting income for OID bonds		
Income Type	**Applicable Regs on whether to report and how**	**More details available via:**
Accrued OID	ALWAYS - section 1272(a)	§1.1272-1(b)(1)
Acquisition Premium	ALWAYS - section 1272(a)(7)	§1.1272-2(a)
Premium	Optional - section 171 or §1.171-4	§1.171-1 constant yield
Market Discount	Optional - section 1278(b)	1276(b)(1) ratable or 1276(b)(2) constant yield
Purchase at Issue	(Treat as Accrued OID)	(Treat as Accrued OID)
Purchase at Maturity	(Treat as premium)	(Treat as premium)

Accrued OID (simply OID) is treated as interest income and is taxed as such. Acquisition Premium offsets OID, thus reducing tax. Premium offsets interest income, also reducing tax, although the investor can elect to amortize premium each year or to delay recognition until disposal. Market Discount is treated as interest income, which the investor can elect to recognize each year or to delay recognition until disposal. If the investor recognizes at disposal, any gains up to the market discount accrued for the period held must still be recognized as ordinary income, although any gains beyond the market discount can be recognized as capital gain.

The IRS allows a taxpayer to ignore OID if it is below a certain threshold. Just as for Market Discount, if the OID is less than 0.25% per year of the maturity price multiplied by the number of whole years remaining until maturity, the taxpayer may treat the bond as if it had no OID. This is called the *de minimis* rule.

OID Computation

OID must be accrued on an annual basis. How one calculates the OID accrual on a long-term debt instrument depends on the date it was issued and the type of debt instrument. List 2 summarizes accrual methods for more common bonds.

List 2 – Summary of accrual methods for more common bonds

Issued	Government	Corporate
Before 1954	Not Covered	Not Covered
1954 to 1969-05-27	OID recognized as ordinary income only upon disposition and only if the bond has a gain	OID recognized as ordinary income only upon disposition and only if the bond has a gain
1969-05-28 to 1982-07-01	OID recognized each year, accrued on a monthly basis	If held as capital assets, OID recognized each year, accrued on a daily basis or accrual-period basis. Use IRS table or the Constant Yield method
1982-07-02 to 1984-12-31	If held as capital assets, OID recognized each year, accrued on a daily basis or accrual-period basis. Use IRS table or the Constant Yield method	(Same as above) If held as capital assets, OID recognized each year, accrued on a daily basis or accrual-period basis. Use IRS table or the Constant Yield method
1985-01-01 and onward	OID recognized each year, accrued on an accrual-period basis. Use IRS table or the Constant Yield method	OID recognized each year, accrued on an accrual-period basis. Use IRS table or the Constant Yield method

For our purpose, we focus on long-term debt of the most recent vintage of 1985 and onward. For these bonds, the taxpayer may use one of two methods:

1. IRS publication 1212 tables - On an annual basis, the IRS publishes tables on its website that has an extensive list of OID bonds by CUSIP and the daily OID accrual to use.
2. Using constant yield to recognize OID on the basis of accrual periods.

Example 7: IRS Publication 1212 Tables
In 2012, the security with CUSIP 4042K0VV4 (HSBC USA, Inc.) has these entries in the IRS table:

2012-01	0.101973
2012-02	0.103695
2012-03	0.105445
2012	37.34

If the taxpayer held this security for all of 2012, then his accrued OID is $37.34 per $1000 face value of the bond.

If the taxpayer held this security for only part of 2012, the computation is more complicated. First he must figure out how many days in each accrual period he held the bond and apply the daily accruals. To figure out the accrual periods, he must look at the issue and maturity dates. In this case, they are 03/31/2009 and 09/30/2014. This means 2012-01 corresponds to 01/01/2012 to 03/31/2012, 2012-02 corresponds to 04/01/2012 to 09/30/2012, and 2012-03 corresponds to 10/01/2012 to 12/31/2012.

The day count also depends on the day-count convention: 30/360, actual/actual, etc. That information is generally not in IRS publication 1212 and the taxpayer must find it separately. Assuming a 30/360 convention and you held $150,000 face value of this bond from 01/01/2012 to 10/31/2012. Your accrued OID is 90 * (0.101973 * 150) + 180 * (0.103695 * 150) + 30 * (0.105445 * 150) = $4,650.90.

If the taxpayer uses constant yield to accrue OID, then formulaically:

- In the first accrual period,

$$Accrued\ OID = Issue\ Price * \left(\frac{YTM}{Accrual\ periods\ per\ year}\right) - QSI$$

- At the end of the first period, the bond's basis is now Issue Price + Accrued OID. This value is also called the Adjusted Issue Price.
- In subsequent periods,

$$Accrued\ ODI = Last\ Period's\ Adjusted\ Issue\ Price * \left(\frac{YTM}{Accrual\ periods\ per\ year}\right) - QSI$$

Bear with us as we define accrual period. For bonds issued between 01/01/1984 and April 3, 1994 (inclusively), an accrual period is each 6-month period that ends on the day that corresponds to the stated maturity date of the debt instrument or the date in 6-month multiples before that date. After April 3, 1994, accrual periods may be of any length and may vary in length over the term of the bond, as long as each accrual period is no longer than 1 year and all payments are made on the first or last day of an accrual period.

For example, take a bond that is issued in 1985 that matures on October 9, 2019. The 3 accrual periods are January 1 to April 9, April 10 to October 9, and October 10 to December 31.

Example 8: Zero-coupon bond purchased at issue, with accrual periods coinciding with the tax year
A zero-coupon bond is issued on 01/01/2001 at 80, maturing at 100 on 12/31/2010. A taxpayer buys $100,000.00 face value of the bond on the day of issue at the issue price and holds to maturity. This is a very simple case of OID. What does the annual OID accrual look like?

Since the purchase price is equal to the issue price, this bond has only OID accrual. This places it in scenario 2, *purchase at issue*. Therefore, we need not worry about calculating premium, acquisition premium, or market discount. First we must decide on the accrual period. The simplest would be to use the calendar year. Per Example 1, the yield is 2.2565%

Since the accrual period coincides with the Tax Year, the Tax Year OID is simply the period OID. Recall that in the first period, the Adjusted Issue Price is just the Issue Price. See Table 8A.

Table 8A – Accrual period = one year

Year	Adjusted Issue Price = Previous Adjusted Issue Price + Accrued OID	Accrued OID = YTM* Adjusted Issue Price
2001	80,000	1,805
2002	81,805	1,846
2003	83,651	1,888
2004	85,539	1,930
2005	87,469	1,974
2006	89,443	2,018
2007	91,461	2,064
2008	93,525	2,110
2009	95,635	2,158
2010	97,793	2,207

As a sanity check, note that if the bond is held to maturity, its final basis is $97,793 + $2,207 = $100,000, which is the maturity price. What if we use the more common 6-month period? Say periods 01/01 to 06/30 and 07/01 to 12/31? As shown in Example 1, the yield is 2.439%. For each year, we now have two accrual periods, Jan to Jun and Jul to Dec. Table 8B shows the full amortization schedule (within rounding).

Table 8B – Accrual period = six month

Year	Begin Basis	Accrued OID Jan to Jun	Adjusted Issue Price on June 30	Accrued OID Jul to Dec	Adjusted Issue Price on December 31	Accrued OID for the entire year
2001	80,000	898	80,898	908	81,805	1,805
2002	81,805	918	82,723	928	83,651	1,846
2003	83,651	939	84,590	949	85,539	1,888
2004	85,539	960	86,498	970	87,469	1,930
2005	87,469	981	88,450	992	89,443	1,974
2006	89,443	1,004	90,446	1,015	91,461	2,018
2007	91,461	1,026	92,487	1,038	93,525	2,064
2008	93,525	1,049	94,574	1,061	95,635	2,110
2009	95,635	1,073	96,708	1,085	97,793	2,158
2010	97,793	1,097	98,890	1,110	100,000	2,207

Notice how a 1-year accrual and a 6-month accrual actually result in the same amount of accrued OID for each tax year. This is the beauty of using Constant Yield: The accrued OID is constant regardless of the length of the accrual period!

Example 9: Zero-coupon bond purchased at issue, accrual periods not coinciding with the tax year
A zero-coupon bond is issued on 04/01/2001 at 80, maturing at 100 on 03/31/2011. A taxpayer buys $100,000.00 face value of the bond on the day of issue at the issue price and holds to maturity. What does the annual OID accrual look like? First we must decide on the accrual period. Let's use the 1-year period from 04/01 to 03/31. By doing this, the Accrued OID for the 1-year period is the same as in Example 8. We must now compute the Daily OID, which is just the Accrued OID divided by the Days Held. Again recall that the purchase day is excluded. See Table 9A.

Table 9A – Accrual period OID

Period	Begin Adjusted Issue Price	Accrued OID	Period Days	Daily OID
April 2001 to March 2002	80,000	1,805	364	4.9594
April 2002 to March 2003	81,805	1,846	365	5.0574
April 2003 to March 2004	83,651	1,888	366	5.1574
April 2004 to March 2005	85,539	1,930	365	5.2882
April 2005 to March 2006	87,469	1,974	365	5.4075
April 2006 to March 2007	89,443	2,018	365	5.5296
April 2007 to March 2008	91,461	2,064	366	5.6389
April 2008 to March 2009	93,525	2,110	365	5.7819
April 2009 to March 2010	95,635	2,158	365	5.9124
April 2010 to March 2011	97,793	2,207	365	6.0458

Now convert from period accrued OID to tax year accrued OID, as shown in Table 9B. The mechanics are the same as for Premium and Market Discount. As a sanity check, the Tax Year OID adds up to $20,000.

Table 9B – Tax-year OID					
Tax Year	Days in Jan to Mar	Daily OID	Days in Apr to Dec	Daily OID	Tax Year OID
2001			274	4.9594	1,359
2002	90	4.9458	275	5.0574	1,837
2003	90	5.0574	275	5.1574	1,873
2004	91	5.1574	275	5.2882	1,924
2005	90	5.2882	275	5.4075	1,963
2006	90	5.4075	275	5.5296	2,007
2007	90	5.5296	275	5.6389	2,048
2008	91	5.6389	275	5.7819	2,103
2009	90	5.7819	275	5.9124	2,146
2010	90	5.9124	275	6.0458	2,195
2011	90	6.0458			544

Now let us increase the complexity of the example by adding in interest payment.

Example 10: 2% OID bond purchased at issue, accrual periods not coinciding with the tax year
A 2% semiannual coupon bond is issued on 04/01/2001 at 80, maturing at 100 on 03/31/2011. The bond pays interest on 09/30 and 03/31 of each year. A taxpayer buys $100,000.00 face value of the bond on the day of issue at the issue price and holds to maturity. What does the annual OID accrual look like?

Since the bond pays a coupon, the accrual periods are anchored. Let us use the periods 04/01 to 09/30 and 10/01 to 03/31, where the end of each of the two 6-month accrual periods is the interest payment date. (Note the accrual periods must be no longer than the 6-months, but can be shorter than the 6-months.) See Table 10A.

The yield is 4.5065%. In the first accrual period, the accrued OID is Issue Price * (Yield adjusted for period) - QSI = ($80,000 * (4.5065%/2)) - $1,000 = $803. In the next period, accrued OID is ($80,803 *(4.5065%/2)) - $1,000 = $821. So on and so forth.

Table 10A – Accrual period OID						
	Begin Basis	QSI	Period OID	End Basis	Day Count	Daily OID
4/1/2001 to 9/30/2001	80,000	1,000	803	80,803	182	4.4098
10/1/2001 to 3/31/2002	80,803	1,000	821	81,623	182	4.5092
4/1/2002 to 9/30/2002	81,623	1,000	839	82,462	183	4.5856
10/1/2002 to 3/31/2003	82,462	1,000	858	83,320	182	4.7146
4/1/2003 to 9/30/2003	83,320	1,000	877	84,198	183	4.7945
10/1/2003 to 3/31/2004	84,198	1,000	897	85,095	183	4.9026
4/1/2004 to 9/30/2004	85,095	1,000	917	86,012	183	5.0130
10/1/2004 to 3/31/2005	86,012	1,000	938	86,950	182	5.1542
4/1/2005 to 9/30/2005	86,950	1,000	959	87,910	183	5.2415
10/1/2005 to 3/31/2006	87,910	1,000	981	88,890	182	5.3890
4/1/2006 to 9/30/2006	88,890	1,000	1,003	89,893	183	5.4804

Table 10A – Accrual period OID *(continued)*						
	Begin Basis	QSI	Period OID	End Basis	Day Count	Daily OID
10/1/2006 to 3/31/2007	89,893	1,000	1,026	90,919	182	5.6346
4/1/2007 to 9/30/2007	90,919	1,000	1,049	91,967	183	5.7301
10/1/2007 to 3/31/2008	91,967	1,000	1,072	93,040	183	5.8592
4/1/2008 to 9/30/2008	93,040	1,000	1,096	94,136	183	5.9912
10/1/2008 to 3/31/2009	94,136	1,000	1,121	95,257	182	6.1599
4/1/2009 to 9/30/2009	95,257	1,000	1,146	96,404	183	6.2643
10/1/2009 to 3/31/2010	96,404	1,000	1,172	97,576	182	6.4406
4/1/2010 to 9/30/2010	97,576	1,000	1,199	98,774	183	6.5498
10/1/2010 to 3/31/2011	98,774	1,000	1,226	100,000	182	6.7341

Now we must calculate the OID for the tax year. Each tax year crosses three accrual periods. See Table 10B.

Table 10B – Tax-year OID							
Tax Year	Days in Jan to Mar	Daily OID	Days in Apr to Sep	Daily OID	Days in Oct to Dec	Daily OID	Tax Year OID
2001			182	4.4098	92	4.5092	1,217
2002	90	4.5092	183	4.5856	92	4.7146	1,679
2003	90	4.7146	183	4.7945	92	4.9026	1,757
2004	91	4.9026	183	5.0130	92	5.1542	1,833
2005	90	5.1542	183	5.2415	92	5.3890	1,919
2006	90	5.3890	183	5.4804	92	5.6346	2,006
2007	90	5.6346	183	5.7301	92	5.8592	2,100
2008	91	5.8592	183	5.9912	92	6.1599	2,190
2009	90	6.1599	183	6.2643	92	6.4406	2,293
2010	90	6.4406	183	6.5498	92	6.7341	2,398
2011	90	6.7341					606

Now let us increase the complexity of the example yet again by adding in acquisition premium.

OID with Acquisition Premium

Example 11: 2% OID bond purchased with acquisition premium
A 2% semiannual coupon bond is issued on 04/01/2001 at 80, maturing at 100 on 03/31/2011. The bond pays interest on 09/30 and 03/31 of each year. A taxpayer buys $100,000.00 face value of the bond on 01/01/2002 for 82.511 dirty price / 82 clean price. The 0.511 is the accrued interest as calculated in Example 4. What is the annual OID accrual?

The adjusted issue price is the original issue price + all accrued OID. On 12/31/2001 this value is 80.000 + 1.217 = 81.217 from Example 9. We add 0.0045092 for the day 01/01/2002 to get 81.2225092. We compare this price, which ignores accrued interest, to the 82.000 clean price, which also ignores accrued interest, and multiply by the face value to compute a total acquisition premium of $778 (rounded to the nearest dollar for simplicity). The investor has two ways of accruing this $778.

Example 11A: Based on 1.1272-2(b)(4) Acquisition Premium Fraction for purchases after July 18, 1984
The OID calculation does not change. What changes is the investor also accrues for acquisition premium. Note that the accrual of acquisition premium is a form of *negative* interest and therefore effectively reduces the OID. Daily Acquisition Premium = Daily OID * (Acquisition Premium / Remaining OID). In this case, Remaining OID = $20,000 - $1,222.5092 = $18,777 (rounded to the nearest dollar for simplicity). Daily Acquisition Premium = Daily OID * ($778/$18,777) = Daily OID * 0.0414336. This is a reduction on OID, so in other words, the Daily OID is scaled down by 0.9585664 (=1-0.0414336). The schedule of the original OID is almost like the one from Example 10, except the OID in 2002 is reduced by one day. The numbers in Table 11A are rounded to the nearest dollar for simplicity.

Table 11A – Acquisition premium fraction

Tax Year	Original Tax Year OID	Acquisition Premium	Net OID
2002	1,674	(69)	1,605
2003	1,757	(73)	1,685
2004	1,833	(76)	1,757
2005	1,919	(80)	1,839
2006	2,006	(83)	1,923
2007	2,100	(87)	2,013
2008	2,190	(91)	2,100
2009	2,293	(95)	2,198
2010	2,398	(99)	2,298
2011	606	(25)	581
Total	18,778	(778)	18,000

The "Net OID" column is the original OID adjusted by the accrual of acquisition premium and it is this net OID number that should be reported as income.

Example 11B: Based on 1.1272-2(b)(5) Constant Yield
The investor may make an election under 1.1272-3 to treat all interest on a debt instrument as OID. The practical effect is to commingle OID and Acquisition premium and use Constant Yield to accrual for both, as opposed to separately calculating an Acquisition Premium fraction, as in Example 11A. This election is actually quite simple: It just means a single constant yield is used to compute all interest income. The yield is 4.3865%. The computation is very similar to Example 6, so we omit any commentary.

Table 11B – Constant yield accrual for acquisition premium

	Begin Basis	QSI	Period OID	End Basis	Day Count	Daily OID
1/1/2002 to 3/31/2002	82,508	489	416	82,416	89	4.6722
4/1/2002 to 9/30/2002	82,413	1,000	808	83,223	183	4.4131
10/1/2002 to 3/31/2003	83,221	1,000	825	84,049	182	4.5346
4/1/2003 to 9/30/2003	84,046	1,000	844	84,892	183	4.6088
10/1/2003 to 3/31/2004	84,890	1,000	862	85,754	183	4.7099
4/1/2004 to 9/30/2004	85,752	1,000	881	86,635	183	4.8132
10/1/2004 to 3/31/2005	86,633	1,000	900	87,535	182	4.9457
4/1/2005 to 9/30/2005	87,533	1,000	920	88,455	183	5.0266
10/1/2005 to 3/31/2006	88,453	1,000	940	89,395	182	5.1651

Table 11B – Constant yield accrual for acquisition premium *(continued)*						
	Begin Basis	QSI	Period OID	End Basis	Day Count	Daily OID
4/1/2006 to 9/30/2006	89,393	1,000	961	90,356	183	5.2495
10/1/2006 to 3/31/2007	90,354	1,000	982	91,337	182	5.3941
4/1/2007 to 9/30/2007	91,336	1,000	1,003	92,341	183	5.4823
10/1/2007 to 3/31/2008	92,339	1,000	1,025	93,366	183	5.6025
4/1/2008 to 9/30/2008	93,365	1,000	1,048	94,414	183	5.7254
10/1/2008 to 3/31/2009	94,413	1,000	1,071	95,484	182	5.8831
4/1/2009 to 9/30/2009	95,484	1,000	1,094	96,578	183	5.9793
10/1/2009 to 3/31/2010	96,578	1,000	1,118	97,697	182	6.1440
4/1/2010 to 9/30/2010	97,696	1,000	1,143	98,839	183	6.2445
10/1/2010 to 3/31/2011	98,839	1,000	1,161	100,000	182	6.3791

Note that in the final period, the formula 4.3869%/2 * $98,839 - $1,000 = $1,168 not the $1,161 listed in Table 11B. But 1.272-1(b)(4)(ii) anticipates these small differences, probably due to rounding, and defines the OID in the final period to be what is needed to arrive at the maturity price.

To reduce tedium, we omit the step of converting period OID to tax year OID. Table 11C lists the net OID using the constant yield, with the net OID from the previous method for the sake of comparison.

Table 11C – Net OID using constant yield			
Tax Year	Original Tax Year OID	Net OID *1.1272-2(b)(4)*	Net OID *1.1272-2(b)(5)*
2002	1,674	1,605	1,641
2003	1,757	1,685	1,685
2004	1,833	1,757	1,764
2005	1,919	1,839	1,840
2006	2,006	1,923	1,922
2007	2,100	2,013	2,004
2008	2,190	2,100	2,099
2009	2,293	2,198	2,189
2010	2,398	2,298	2,282
2011	606	581	574
Total	18,778	18,000	18,000

Example 12: Sale of an OID bond
Assume the bond in Example 11 is sold on 12/31/2007 for 93 (clean price). Assume the investor used constant yield to calculate OID and acquisition premium. What is the gain/loss?

We compute the cost basis. The accrued OID is $1641+$1685+$1764+$1840+$1922+$2004=$10,856. We add this to the clean basis of $82,000. The basis at the end of 2007 is $92,856. Since the sale was at $93,000, the investor has a capital gain of $93000-$92856 = $144.

Example 13: Purchasing an OID Bond at Market Premium (not just acquisition premium)
A 2% semiannual coupon bond is issued on 04/01/2001 at 80, maturing at 100 on 03/31/2011. The bond pays interest on 09/30 and 03/31 of each year. A taxpayer buys $100,000.00 face value of the bond on 01/01/2002 for 102.511 dirty price / 102 clean price. What does the annual premium amortization look like?

The computation for premium amortization for an OID is the same as for a non-OID. This example is essentially the same as Example 5. Please consult that example for a data table.

Example 14: Selling a bond bought at Market Premium
The bond in Example 13 is sold on 12/31/2007 for 100. What is the gain/loss? The gain/loss depends on whether the taxpayer chose to amortize premium on an annual basis or to recognize at disposition.

Example 14A: Recognize premium on an annual basis
The total amount of amortization at the end of 2007 is ($1,255). The basis of the bond is therefore $102,000-$1,255=$100,745. Since the bond is sold for $100,000, this sale generates a capital loss of $745.

Example 14B: Recognize premium at disposition
The basis of the bond is still $102,000. Since the bond is sold for $100,000, this sale generates a capital loss of $2,000.

Table 14 presents a summary for Example 14A and Example 14B. In both cases, the total "loss" is $2,000, but the characteristics of the losses are very different.

Table 14 – Premium recognized on an annual basis and at disposition

	Example 14A: Amortize premium on an annual basis	Example 14B: Recognize premium at disposition
Basis at time of sale	100,745	102,000
Loss from sale	(745)	(2,000)
Cumulative *negative* interest	(1,255)	0

OID with Market Discount

Example 15: Purchasing a 2% OID bond with market discount
Despite its length, this example is very similar to Example 6 for a basic non-OID bond. A 2% semiannual coupon bond is issued on 04/01/2001 at 80, maturing at 100 on 03/31/2011. The bond pays interest on 09/30 and 03/31 of each year. A taxpayer buys $100,000 face value of the bond on 01/01/2002 for 80.511 dirty price / 80 clean price. What does the annual market discount accretion look like under ratable accrual? Under constant yield accrual?

Ratable Accrual
Under ratable accrual, the market discount is accreted in direct proportion to the days held. From Example 11, we know the adjusted issue price on 01/01/2002 is 81.222. This means a market discount of $1,222 (rounded to nearest dollar for simplicity) is generated. On 01/01/2002, the bond still has 3376 days until it matures on 03/31/2011. We get the daily market discount by $1222/3376 = $0.361967. Then multiply this by the number of days held in a tax year to get the market discount for that year. See Table 15A.

Table 15A – Ratable accrual		
Tax Year	Days	Market Discount
2002	364	132
2003	365	132
2004	366	132
2005	365	132
2006	365	132
2007	365	132
2008	366	132
2009	365	132
2010	365	132
2011	90	33

Constant Yield Accrual, Take 1: Separately report Market Discount from OID

Analogous to Example 11 regarding Acquisition Premium, Market Discount can be accrued in one of two ways. In this method, we calculate the entire accrued OID and Market Discount and then back out the accrued OID to find the accrued Market Discount. For simplicity, Combined = OID + Market Discount. First we need the yield. As in Example 6, the yield is 4.6877%.

In the first period, the taxpayer only held the bond for 3 months, which is a quarter of a year. Thus we scale the 4.6877%, an annualized yield, down by 4. Thus Accrued Combined = $82511* (4.6877% / 4) - $489 = $455 and the end basis is the clean price of $82,000 + $455 (refer to Example 4 for explanation). In subsequent periods, Accrued Combined = Begin Basis * (4.6877% / 2) - QSI. The Begin Basis = Prior Begin Basis + Accrued Combined. For tax purposes, we need a Daily Combined column, which is the Accrued Combined divided by Day Count. See Table 15B.

Table 15B – Constant yield						
	Begin Basis	QSI	Accrued Combined	End Basis	Days Held	Daily Combined
1/1/2002 to 3/31/2002	80,511	489	455	80,455	89	5.1069
4/1/2002 to 9/30/2002	80,455	1,000	886	81,340	183	4.8400
10/1/2002 to 3/31/2003	81,340	1,000	906	82,247	182	4.9807
4/1/2003 to 9/30/2003	82,247	1,000	928	83,174	183	5.0696
10/1/2003 to 3/31/2004	83,174	1,000	949	84,124	183	5.1884
4/1/2004 to 9/30/2004	84,124	1,000	972	85,096	183	5.3100
10/1/2004 to 3/31/2005	85,096	1,000	995	86,090	182	5.4643
4/1/2005 to 9/30/2005	86,090	1,000	1,018	87,108	183	5.5619
10/1/2005 to 3/31/2006	87,108	1,000	1,042	88,150	182	5.7235
4/1/2006 to 9/30/2006	88,150	1,000	1,066	89,216	183	5.8256
10/1/2006 to 3/31/2007	89,216	1,000	1,091	90,307	182	5.9949
4/1/2007 to 9/30/2007	90,307	1,000	1,117	91,424	183	6.1019
10/1/2007 to 3/31/2008	91,424	1,000	1,143	92,566	183	6.2449
4/1/2008 to 9/30/2008	92,566	1,000	1,170	93,736	183	6.3913
10/1/2008 to 3/31/2009	93,736	1,000	1,197	94,933	182	6.5771

Table 15B – Constant yield *(continued)*						
	Begin Basis	QSI	Accrued Combined	End Basis	Days Held	Daily Combined
4/1/2009 to 9/30/2009	94,933	1,000	1,225	96,158	183	6.6944
10/1/2009 to 3/31/2010	96,158	1,000	1,254	97,412	182	6.8890
4/1/2010 to 9/30/2010	97,412	1,000	1,283	98,695	183	7.0119
10/1/2010 to 3/31/2011	98,695	1,000	1,305	100,000	182	7.1701

We then convert this into the tax year numbers, breaking Combined into OID and Market Discount. (Note: Comb = Combined). See Table 15C. The highlighted new columns here are:

Tax Year OID = From Example 10, except 2002 is reduced by one day's worth of $4.5092
Tax Year Discount = Tax Year Comb - Tax Year OID

Table 15C – Constant yield accrual separating OID and discount									
Tax Year	Jan-Mar Days	Daily Comb	Apr-Sep Days	Daily Comb	Oct-Dec Days	Daily Comb	Tax Year Comb	Tax Year OID	Tax Year Discount
2002	89	5.1069	183	4.8400	92	4.9807	1,798	1,674	124
2003	90	4.9807	183	5.0696	92	5.1884	1,853	1,757	96
2004	91	5.1884	183	5.3100	92	5.4643	1,947	1,833	114
2005	90	5.4643	183	5.5619	92	5.7235	2,036	1,919	117
2006	90	5.7235	183	5.8256	92	5.9949	2,133	2,006	126
2007	90	5.9949	183	6.1019	92	6.2449	2,231	2,100	130
2008	91	6.2449	183	6.3913	92	6.5771	2,343	2,190	153
2009	90	6.5771	183	6.6944	92	6.8890	2,451	2,293	158
2010	90	6.8890	183	7.0119	92	7.1701	2,563	2,398	165
2011	90	7.1701					645	606	39

The taxpayer may elect to recognize the tax year discount on an annual basis.

Constant Yield Accrual, Take 2: Combine OID and Discount
Notice how we had to back into the market discount number. As for acquisition premium in Example 10, the investor can elect under 1.1272-3 to report a combined OID and Market Discount as total interest income using constant yield. We simply use the column "Tax Year Comb(ined)." Of course this also means the taxpayer has elected to recognize market discount on an annual basis.

Example 16: Sale of 2% OID purchased with market discount
The bond in Example 15 is sold at the end of 2007 for 92.06 clean price. What is the gain or loss? Table 16 summarizes the four possible scenarios:

A. Taxpayer elects not to recognize market discount on an annual basis (aka, not to include in current income); he does not explicitly elect an accrual method
B. Taxpayer elects to recognize market discount on an annual basis (aka, include in current income); and elects to accrue using ratable accrual (or makes no decision)
C. Taxpayer elects to recognize market discount on an annual basis (aka, include in current income); and elects to accrue using constant yield accrual
D. Taxpayer elects to recognize all interest income as OID income

Table 16 – How elections affect reporting				
	(A) Recognize at Disposal	(B) Accrue with Ratable	(C) Accrue with Constant Yield	(D) 1.1272-3 election
Clean Purchase Price	80,000	80,000	80,000	80,000
Recognized OID	11,290	11,290	11,290	NA
Recognized Discount	0	793	708	NA
Recognized All-OID	NA	NA	NA	11,998
Basis at Sale	91,290	92,083	91,998	91,998
Sale Price	92,060	92,060	92,060	92,060
Ordinary Income	770	NA	NA	NA
Gain/(Loss)	0	(23)	62	62

The cases (B), (C), (D) are fairly straight forward. Note that cases (C) and (D) have the similar numerical results. However, they do result in slightly different reporting. For (C), the OID and market discount are reported in two different boxes where as in (D), OID and market discount are reported as a combined 11,998 in one box.

Case (A) requires some explaining. If the investor did not recognize market discount on an annual basis, then the gain up to the accrued discount is treated as ordinary income. Is accrued discount $793 or $708? The taxpayer could have chosen to accrue using either constant yield or ratable accrual, even though he does not recognize the accrued market discount on an annual basis.

In the absence of an election, the default is to use ratable accrual, so the accrued discount is $793. In Case (A), the apparent gain is $770, which is less than $793, so the entire $770 is treated as ordinary income. If the taxpayer had elected to accrue using constant yield, he would have to use $708. In either case, he would have to perform the computations of case (B) or (C) despite electing to recognize market discount at time of disposition.

Conclusion

Even the "basics" of bond math for taxation are not simple. The underlying math is intrinsically complicated as the taxpayer is forced to grapple with compounding and non-linear equations. In addition, the taxpayer must (as in OID) or may (as in market premium and discount) recognize imputed interest on an annual basis, meaning he must calculate such interest regularly.

Part of the goal of Phase III is to assist the taxpayer by requiring brokers to calculate complex basis adjustments for fixed income (bonds). In this paper we concentrate on the parts of bond math that are relevant to both the taxpayer and his broker. However, we somewhat limit the scope of our discussion to keep the amount of material more manageable.

We do not cover bonds with call- and put-features, which are covered by Phase III. The examples we use start off basic and gradually increase in complexity. We do this to give enough time to absorb the basic material. We also only touch on how elections can affect a taxpayer's liability. In the future, we shall cover bonds with option features and taxpayer elections. If this paper hasn't felt like a trip down the rabbit hole, those surely will!

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