

# Module B

## Advanced Bond Yield Computation

### Overview

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#### Introduction

Yield on a bond issue is calculated in accordance with Treas. Reg. section 1.148-4. Module M of Phase I of this course and Module A of this text discussed general principles of the computation of bond yield.

Module B continues this discussion by considering the computation of bond yield when special circumstances are present.

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#### Objectives

At the end of this module the student will be able to:

- Compute the yield of a bond issue subject to optional early redemption.
  - Compute the yield of a variable rate bond issue when it is converted to a fixed yield issue.
  - Identify a qualified guarantee and incorporate related payments into the computation of bond yield.
  - Identify a qualified hedging transaction and incorporate related payments into the computation of bond yield.
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#### In this module

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# Section 1

## Fixed Yield Issues

### Overview

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**Introduction** This section discusses the computation of yield on a fixed yield issue under special circumstances.

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**In this section** This section contains the following topics:

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## Bonds Subject to Optional Early Redemption

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### Special Rule

According to Treas. Reg. section 1.148-4(b)(3), if a fixed yield bond is subject to optional early redemption and is described in Treas. Reg. section 1.148-4(b)(3)(ii), then the yield on the issue containing the bond is computed by treating the bond as redeemed at its stated redemption price on the optional redemption date that would produce the lowest yield on the issue.

A fixed yield bond is described in Treas. Reg. section 1.148-4(b)(3)(ii) only if it:

1. is subject to optional redemption within five years of the issue date, AND the yield on the issue computed by assuming that all bonds subject to the early redemption will be redeemed **on their maturity date** is more than 0.125% higher than the yield on the issue computed by assuming that all bonds subject to optional redemption are redeemed **at the earliest call date**,
2. is issued at an issue price that exceeds its stated redemption price at maturity by more than 0.25% times the product of the stated redemption price at maturity and the number of complete years to the first optional redemption date, OR
3. bears interest at increasing interest rates.

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## Bonds Subject to Optional Early Redemption, Continued

**Special Rule,  
(continued)**

Example 1

On January 1, 1994, City A issues \$30 million principal amount of bonds. The issue contains three bonds, each having a principal amount of \$10 million. Bond X bears interest at five percent per year and matures on January 1, 1999.

Bond Y bears interest at six percent per year and matures on January 1, 2002. Bond Z bears interest at seven percent per year and matures on June 1, 2004. Bonds Y, and Z are callable by the issuer at par plus accrued interest after December 31, 1998.

First, compute the yield on the issue by assuming that each bond will remain outstanding to its stated maturity date. The yield is 6.0834 percent, compounded semiannually, computed as shown in Table B-1.

<b>TABLE B-1: COMPUTATION OF YIELD (TO MATURITY DATE)</b>		
<b><u>DATE</u></b>	<b><u>PAYMENTS</u></b>	<b><u>PRESENT VALUE</u> <u>(6.0834%)</u></b>
1/1/95	1,800,000.00	\$1,695,299.66
1/1/96	1,800,000.00	\$1,596,689.41
1/1/97	1,800,000.00	\$1,503,815.01
1/1/98	1,800,000.00	\$1,416,342.82
1/1/99	11,800,000.00	\$8,744,839.76
1/1/00	1,300,000.00	\$907,375.75
1/1/01	1,300,000.00	\$854,596.56
1/1/02	11,300,000.00	\$6,996,328.64
1/1/03	700,000.00	\$408,191.32
1/1/04	<u>10,700,000.00</u>	<u>\$5,876,564.06</u>
<b>TOTAL</b>	<b>44,300,000.00</b>	<b>\$30,000,042.98</b>

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## Bonds Subject to Optional Early Redemption, Continued

**Special Rule,**  
(continued)

Second, compute the yield on the issue by assuming that the bonds will be redeemed on their earliest redemption date. The yield computed as follows is 5.9126 percent, compounded semiannually, as shown in Table B-2:

<b>TABLE B-2: COMPUTATION OF YIELD (TO EARLIEST REDEMPTION DATE)</b>		
<b><u>DATE</u></b>	<b><u>PAYMENTS</u></b>	<b><u>PRESENT VALUE</u></b> <b><u>(5.9126%)</u></b>
1/1/95	1,800,000.00	\$1,698,113.25
1/1/96	1,800,000.00	\$1,601,993.68
1/1/97	1,800,000.00	\$1,511,314.83
1/1/98	1,800,000.00	\$1,425,768.75
1/1/99	<u>31,800,000.00</u>	<u>\$23,762,813.15</u>
<b>TOTAL</b>	<b>39,000,000.00</b>	<b>\$30,000,003.67</b>

Analysis

The yield computed assuming no early redemption (6.0834 percent) exceeds the yield computed assuming bonds being redeemed at the earliest call date (5.9126 percent) by more than 0.125 percent.

Therefore, each bond is treated as redeemed on the date that would produce the lowest yield on the issue. The lowest yield on the issue would result from all the bonds being redeemed on the earliest redemption date, January 1, 1999.

The yield on the issue is 5.9126 percent, compounded semiannually.

**(See Treas. Reg. section 1.148-4(b)(6), Example 3.)**

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## Bonds Subject to Optional Early Redemption, Continued

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**Special Rule,  
(continued)**

Example 2

On January 1, 1995, City X issues bonds in the principal amount of \$10 million. The stated maturity date of the bonds is January 1, 2005. The stated redemption price at maturity for the bonds is \$9 million. The bonds may be redeemed at the option of City X on January 1, 1999.

The product of the stated redemption price at maturity and the number of complete years to the first redemption date is:

$$9,000,000 \times 4 = 36,000,000$$

This product times 00.25% equals:

$$36,000,000 \times 0.25\% = 900,000$$

Therefore, in order to be a fixed yield bond, the issue price must exceed the redemption price by more than \$900,000.

The issue price (\$10 million) exceeds the stated redemption price (\$9 million) by \$1 million. 1 million is more than 900,000.

Therefore, the yield on the issue should be calculated as if all of the bonds are redeemed on January 1, 1999.

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## Transfer of Certain Rights Associated with the Bond

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### **General Rule**

According to Treas. Reg. section. 1.148-4(b)(4), if the issuer transfers, waives, or modifies any right associated with the bond, AND such transfer is separate from the original sale of the bond, then the issue is treated as if retired and reissued on the transfer date.

The redemption price of the retired issue and the issue price of the new issue equals the aggregate values of all of the bonds on the transfer date.

In computing yield on the new issue, all amounts received by the issuer in consideration of the transfer are taken into account.

### Example

County X issues \$10 million principal amount of bonds on June 1, 1994. The bonds are subject to optional redemption on or after June 1, 2004. On August 1, 1998, County X sells its right to redeem the bonds to Corporation Y for an amount equal to \$500,000. The yield on the issue is calculated as if the bonds were retired and reissued as new bonds on August 1, 1998. The redemption price of the issue and the issue price of the new issue will be the aggregate value of the bonds on August 1, 1998. The \$500,000 is taken into account as a payment received by County X.

The value of the bonds is determined as described in Section 3 of this module.

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## Special Aggregation Rules

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**General Rule** According to Treas. Reg. section 1.148-4(b)(5), two variable rate bonds of an issue are treated as a single fixed yield bond if:

- the aggregate treatment would result in a fixed yield bond, AND
- the terms of the bonds do not contain any features that would distort the aggregate yield from what it would be if a fixed yield bond were issued.

### Example

County Y issues bonds in the aggregate principal amount of \$50 million. \$25 million principal amount of the bonds are issued as variable rate bonds (“floaters”) for which the interest rate is determined every 35 days. The other \$25 million principal amount of the bonds (“inverse floaters”) bear interest at a fixed rate minus the interest rate on the floaters. In addition, if County Y decides to redeem a portion of the floaters, it must also redeem a similar principal amount of the inverse floaters.

The yield on the issue is the fixed yield on the floaters and the inverse floaters.

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## Section 2

### Conversion from Variable to Fixed Yield Issue

#### Overview

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**Introduction** An issuer of variable yield bonds may convert the interest rate(s) on the bonds to a fixed interest rate(s). There are various economic reasons for the issuer to convert a variable yield issue to a fixed yield issue. The conversion causes a change in the yield of the issue.

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**Recalculation of Yield** When converted, the issue is treated as if reissued on the date (“conversion date”) the variable interest rate on the issue is converted to a fixed interest rate.

The variable yield bonds are redeemed on the conversion date, and the fixed yield bonds are issued on the conversion date.

According to Treas. Reg. section 1.148-4(d), calculating the yield on the bonds requires two steps:

Step	Action
1	Determine the yield on the variable yield issue from its date of issuance to the conversion date. The redemption price of the variable yield issue is equal to the aggregate values of all of the bonds on the conversion date. The yield is computed as described in Module M of Phase I and in Treas. Reg. section 1.148-4(c).
2	Determine yield on the fixed yield issue. The issue date of the fixed yield issue is the conversion date. The issue price of the issue is equal to the aggregate values of all of the bonds on the conversion date. The issue price should be the same as the redemption price used in Step 1 to calculate the yield on the variable yield issue on the conversion date. The yield is computed as described in Module M of Phase I and in Treas. Reg. section 1.148-4(b).  The value of the bonds in both steps is determined as described in Section 3 of this module.

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## Section 3

### Value of Bonds

#### Overview

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##### Introduction

As discussed in Sections 1 and 2 of this module, prior to computing the bond yield under Treas. Reg. sections 1.148-4(b)(4) and 1.148-4(d), the value of bonds must be determined.

Treas. Reg. section 1.148-4(e) discusses how bonds are valued for such purpose.

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##### Plain Par Bonds

According to Treas. Reg. section 1.148-4(e)(1) the value of a plain par bond is its outstanding principal amount, plus accrued and unpaid interest.

The value of a bond that is actually redeemed, or treated as redeemed, is its stated redemption price, plus accrued and unpaid interest.

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##### Definition of a Plain Par Bond

According to Treas. Reg. section 1.148-1(b), a plain par bond means an investment that is an obligation:

- issued with no more than a de minimis amount of original issue discount or premium;
  - issued for a price that does NOT include accrued interest other than pre-issuance accrued interest;
  - that bears interest at a fixed rate determinable on the issue date, or at a variable rate. The interest is payable unconditionally at least annually; AND
  - that has a lowest redemption price which is NOT less than the outstanding stated principal amount.
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##### Other Bonds

According to Treas. Reg. section 1.148-4(e)(2), the value of a bond other than a plain par bond on any date is its present value on such date.

The present value is calculated under the economic accrual method using the yield on the bond as the discount rate.

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## Section 4

### Qualified Guarantees

#### Overview

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**Introduction** The present value of all payments of principal and interest, and qualified guarantee payments made with respect to the bonds are included in the computation of the bond yield. According to Treas. Reg. section 1.148-4(f)(1), the fees properly allocable to a qualified guarantee are treated as additional interest on the issue. Therefore, it is necessary to be able to identify a qualified guarantee.

Module A of Phase I of this course described various types of credit enhancements which may qualify as qualified guarantees under Treas. Reg. section 1.148-4(f).

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**In this Section** This section contains the following topics:

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## Elements of a Qualified Guarantee

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**Introduction**      Treas. Reg. section 1.148-4(f) contains requirements which must be met for a guarantee to be a qualified guarantee. These requirements are discussed below.

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**Interest Savings**      According to Treas. Reg. section 1.148-4(f)(2) the issuer must reasonably expect that, as a result of the guarantee, the present value of the fees payable for the guarantee are less than the present value of the expected interest savings on the bonds. The present value is calculated using the yield on the issue determined without regard to the qualified guarantee.

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**Guarantee in Substance**      Treas. Reg. section 1.148-4(f)(3) provides that the guarantee must impose a secondary liability that unconditionally shifts substantially all of the credit risk for all or part of the payments on the bonds. Reasonable procedural and administrative requirements do not cause the guarantee to be conditional.

On the date of issuance, the issuer must reasonably expect to be able to pay debt service on the guaranteed bonds. The guarantor must not be a co-obligor and must not expect to make any payments on the bonds (unless under a direct pay letter of credit or similar arrangement where the guarantor is reimbursed immediately.) (See **Rev. Rul. 72-134, 1972-1 C.B. 29, Rev. Rul. 72-575, 1972-2 C.B. 74, and Rev. Rul. 76-78, 1976-1 C.B. 25.**)

However, in Rev. Rul. 94-42, 1994-2 C.B. 15, the Service held that amounts paid by the guarantor on a guarantee agreement are not excludable from gross income under IRC section 103 if, at the time the guarantee is purchased, the amount paid is not reasonable or customary, or it is not reasonably expected that the issuer of the bonds, rather than the guarantor, will pay debt service on the bonds. Such an agreement is not incidental and in substance is a separate debt instrument when purchased. The result is the same regardless of whether the issuer or the holders of the bonds purchase the guarantee.

In Rev. Rul. 94-42, one year after the issuance date, the holder of the bonds entered into an agreement with a third-party to insure the payment of the debt service. At that time there was significant risk that revenues from the bond-financed facility would be insufficient to pay debt service. The third-party insurer purchased Treasury securities, placing them in a trust to secure its obligation under the agreement. The holder then sold the bonds.

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## Elements of a Qualified Guarantee, Continued

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**Limit on Use of Proceeds** The guarantor or a related party together must not use more than 10 percent of the proceeds of the bond issue in its trade or business.

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**Reasonable Charge** Treas. Reg. section 1.148-4(f)(4) requires that the fee must not exceed a reasonable, arm's-length charge. The issuer may not rely upon the representations of the guarantor regarding the reasonableness of the fees.

The amounts included as guarantee fees in the yield computation must not include fees for services other than for the transfer of credit risk. Examples of fees which include payment for services other than transfer of credit risk are:

- underwriting and remarketing costs,
- cost of casualty insurance for the bond-financed facility,
- the fee is refundable upon early redemption of the bonds and the amount of refund would exceed the unearned portion of the fee, OR
- the three-year temporary period rules are not met and the guarantor is not reasonably assured that the bonds will be repaid if the project is not completed.

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## Elements of a Qualified Guarantee, Continued

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### **Purpose Investments**

According to Treas. Reg. section 1.148-4(f)(5), a guarantee for purpose investments, such as payment by the conduit borrower on the loan, may be a qualified guarantee if:

- all payments on the purpose investments reasonably coincide with the payments on the underlying bonds,
- payments on the purpose investments must be unconditionally payable not more than six months before the corresponding interest payment and twelve months before the corresponding principal payment, AND
- the guarantee is, in substance, a guarantee on the bonds allocable to the purpose investments and no other bonds.

A guarantee on purpose investments for qualified mortgage loans and qualified student loans is not a qualified guarantee.

### Example

Industrial Development Authority of City A issues bonds and loans the proceeds to Corporation X. Corporation X uses the proceeds to build a low-income multifamily project. As security for the payments to be made by Corporation X, City A will have a mortgage on the project. City A will use the payments made by Corporation X to pay debt service on the bonds. Because Corporation X has no financial history, the bonds are a risky investment and will be difficult to sell. The Federal Housing Administration (FHA) insures the mortgage payments to be made by Corporation X to City A - but does NOT insure the debt service payments. As long as the mortgage payments coincide with the debt service payments, the mortgage insurance is a qualified guarantee and premium payments made by Corporation X to FHA may be taken into account in the yield calculation.

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# Allocation of Qualified Guarantee Payments

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## **Introduction**

If a guarantee is a qualified guarantee, the fees paid to the guarantor are included in computing the yield on the bonds which are guaranteed.

Treas. Reg. section 1.148-4(f)(6)(i) provides that, in computing the yield, such fee must be allocated to bonds and the computation periods in a manner that properly reflects the credit risk.

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## **Reasonable Methods of Allocation**

If the proportionate risk for the bonds is not substantially identical over the term of the bonds, the allocation must be made using a reasonable, consistently-applied method.

For example, a reasonable method for allocating risk may be based on the ratio of total principal and interest on the guaranteed bond to the total principal and interest paid on all bonds of the guaranteed issue.

An allocation method which allocates a substantial amount of the fee to the construction period and an insubstantial amount to the later years covered by the guarantee is NOT reasonable.

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## **Letter of Credit Fees**

Up-front letter of credit fees may be allocated ratably during the initial term of the letter of credit.

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## **Early Redemption**

If variable yield bonds are redeemed early, fees which were allocated to the period after the redemption are allocated to the remaining outstanding bonds.

If no bonds remain outstanding, then the fees are allocated to the period before the redemption.

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## Safe Harbor for Variable Yield Issues

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**General Rule** According to Treas. Reg. section 1.148-4(f)(6)(ii), an allocation of non-level payments for a qualified guarantee of a variable yield bond is proper if, for each bond year the guarantee is in effect, an equal amount is treated as paid as of the beginning of the bond year.

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**Calculation of Present Value** The present value of the annual amounts must equal the fee for the guarantee allocated to that bond, with present value computed as of the first day the guarantee is in effect.

Present value is calculated by using as the discount rate the yield on the bonds covered by the guarantee, determined without regard to any fee allocated as described in paragraph (f)(6)(ii).

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## Safe Harbor for Variable Yield Issues, Continued

### Example

On January 1, 1999, City Y pays a LOC fee of \$100,000. The bonds are ten-year bonds. When City Y calculates the yield on the bonds, in order to meet Treas. Reg. section 1.148-4(f)(6)(ii), City Y includes \$12,950.50 along with required principal and interest payments for each of ten years. \$12,950.50 (rather than \$10,000) is included each year because the present value of the payments using the bond yield (without the LOC fees) must equal \$100,000. (See Table B-3.)

Remember, though, that only \$100,000 is actually paid, AND it is paid on the issuance date. The allocated annual payments of \$12,950.50 are not actually paid by City Y.

<b>TABLE B-3: PRESENT VALUE OF LOC FEE</b>			
LOC PAYMENT	\$100,000.00		
PAYMENT DATE	1/1/99		
COMP INTERVALS	1		
YIELD	5%		
<b><u>DATE</u></b>	<b><u>CASH</u></b>	<b><u>PRESENT</u></b>	<b><u>DAYS</u></b>
	<b><u>FLOWS</u></b>	<b><u>VALUE</u></b>	
1/1/00	12,950.50	\$12,333.81	360
1/1/01	12,950.50	\$11,746.49	720
1/1/02	12,950.50	\$11,187.13	1080
1/1/03	12,950.50	\$10,654.41	1440
1/1/04	12,950.50	\$10,147.06	1800
1/1/05	12,950.50	\$9,663.86	2160
1/1/06	12,950.50	\$9,203.68	2520
1/1/07	12,950.50	\$8,765.41	2880
1/1/08	12,950.50	\$8,348.01	3240
1/1/09	<u>12,950.50</u>	<u>\$7,950.48</u>	3600
TOTALS	\$129,505.00	\$100,000.33	

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## Refund or Reduction of Guarantee Payments

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**General Rule**      Treas. Reg. section 1.148-4(f)(7) provides that if as a result of a refunding, the issuer receives a refund of a portion of an up-front payment made to the guarantor of the refunded bonds, the issuer should treat such refund as a reduction in payments on the refunding bonds.

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## Section 5

### Qualified Hedging Transactions

#### Overview

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**Introduction** According to Treas. Reg. section 1.148-4(h)(1), payments made or received by an issuer under a qualified hedge relating to a bond issue are taken into account in calculating yield on the issue.

Except as otherwise provided in Treas. Reg. sections 1.148-4(h)(4) and (5)(ii)(E), the bonds are treated as variable yield bonds from the issue date.

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**In this Section** This section contains the following topics:

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# Types of Hedges

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## Introduction

There are various types of qualified hedges. Some of the most common types are:

- swaps,
- caps,
- floors,
- collars,
- forwards, and
- options.

These are discussed below.

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## Interest Rate Swap

In an interest rate swap, one party makes a periodic payment based on a fixed rate of interest times a notional principal amount. In return, the other party makes periodic payments based on a variable rate of interest times the same notional principal amount.

### Example

Issuer issues \$100 million principal amount of bonds bearing interest at a variable rate. The issuer does this because variable rates are lower than fixed rates. However, the issuer wants to know in advance the amount of debt service it owes so it can match its revenues. The variable rate on the bonds is based on the J.J. Kenny index.

The issuer enters into a five-year interest rate swap with the bank. Under the swap contract, the bank will, on a monthly basis, pay the issuer an amount equal to the interest rate based on the J.J. Kenny index times \$100 million. The issuer will pay the bank an amount equal to five percent times \$100 million. Instead of the bank paying the issuer and the issuer paying the bank, the parties agree to exchange only the net cash flows. Accordingly, if the J.J. Kenny index variable rate is more than five percent, the bank will pay the issuer. If it is less than five percent, the issuer will pay the bank.

The \$100 million is not exchanged. It is called the notional principal amount.

The payments from the bank to the issuer or the issuer to the bank are the periodic payments. There is no up-front payment made when the swap is first entered.

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## Types of Hedges, Continued

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**Types of Swaps**    Floating-to-fixed rate swaps: The issuer agrees to make fixed rate swap payments and to receive floating rate payments based on a floating rate index, similar to the example above.

Fixed-to-floating rate swaps: The issuer agrees to make payments based on a floating rate index and to receive fixed rate payments from the swap party.

Floating-to floating rate swaps: The issuer agrees to make payments based on a floating interest rate index and to receive payments from the swap party based on another floating rate index.

In each case, the payments are based on a notional principal amount and the payments are netted. The issuer's decision to issue fixed or floating rate bonds, and to enter into a swap is generally based on economic objectives.

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**Cap**                    In a cap, a party pays a premium and in return receives payments based on a notional principal amount only if a specified index exceeds a certain level, known as a cap.

An issuer of floating rate bonds can purchase a cap under which the issuer would be protected if the interest rates increased beyond a certain rate. The issuer would pay a premium to the cap provider.

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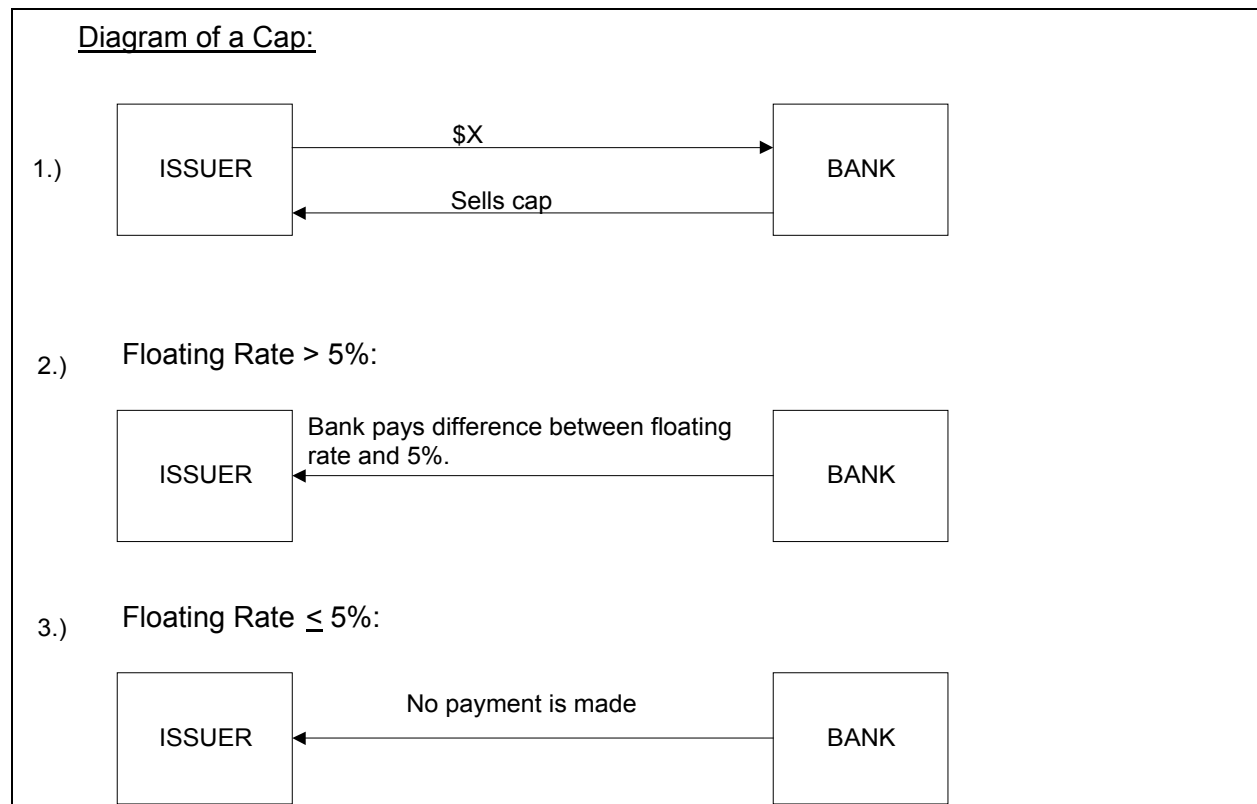
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## Types of Hedges, Continued

### Cap, (continued)

#### Example

The issuer issues bonds bearing interest at a floating rate determined weekly and based on the J.J. Kenny Index. The issuer does not want to pay a floating rate which is greater than five percent. The issuer enters into an agreement with Bank under which Bank receives \$X and Bank agrees that if the weekly J.J. Kenny Index goes above five percent, it will pay to the issuer the difference between the then floating interest rate and five percent. Five percent is referred to as the “strike rate.” The issuer has purchased a cap from Bank.



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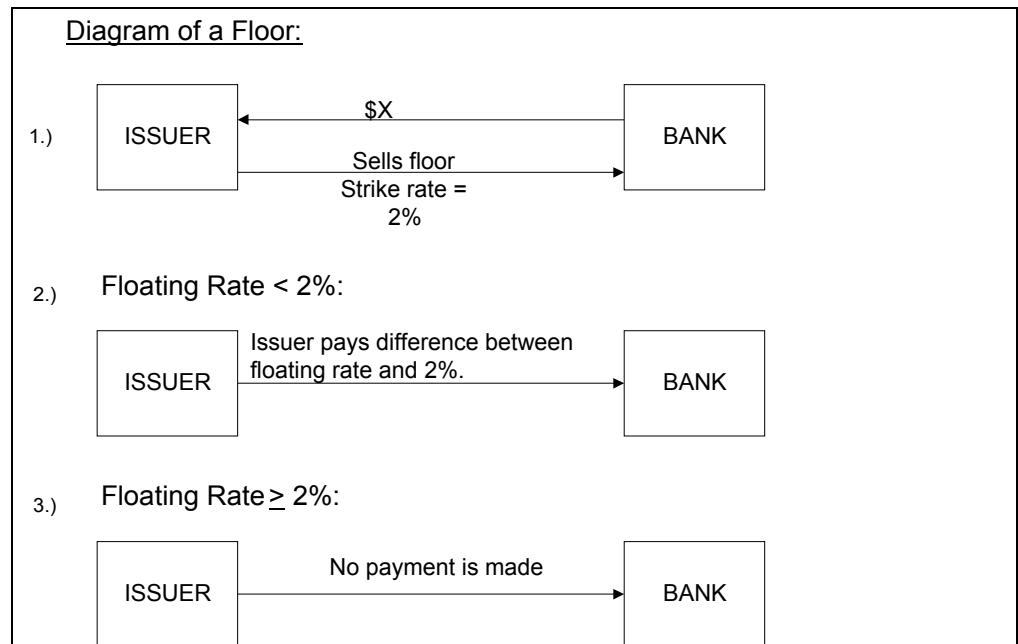
## Types of Hedges, Continued

### Floor

A floor is the opposite of a cap. In a floor, the issuer receives a premium from the floor provider, and has the obligation to make payments based on a notional principal amount if a specified index falls below a certain level, known as a floor. The floor rate is the strike rate, and the issuer pays the difference between the then floating rate and the strike rate.

### Example

The issuer issues bonds bearing interest at a floating rate determined weekly and based on the J.J. Kenny Index. The issuer enters into an agreement with Bank under which the issuer receives \$X from the Bank and agrees that if the weekly J.J. Kenny Index goes below two percent (strike rate), it will pay to Bank the difference between two percent and the then floating interest rate. The issuer has sold a floor to Bank.



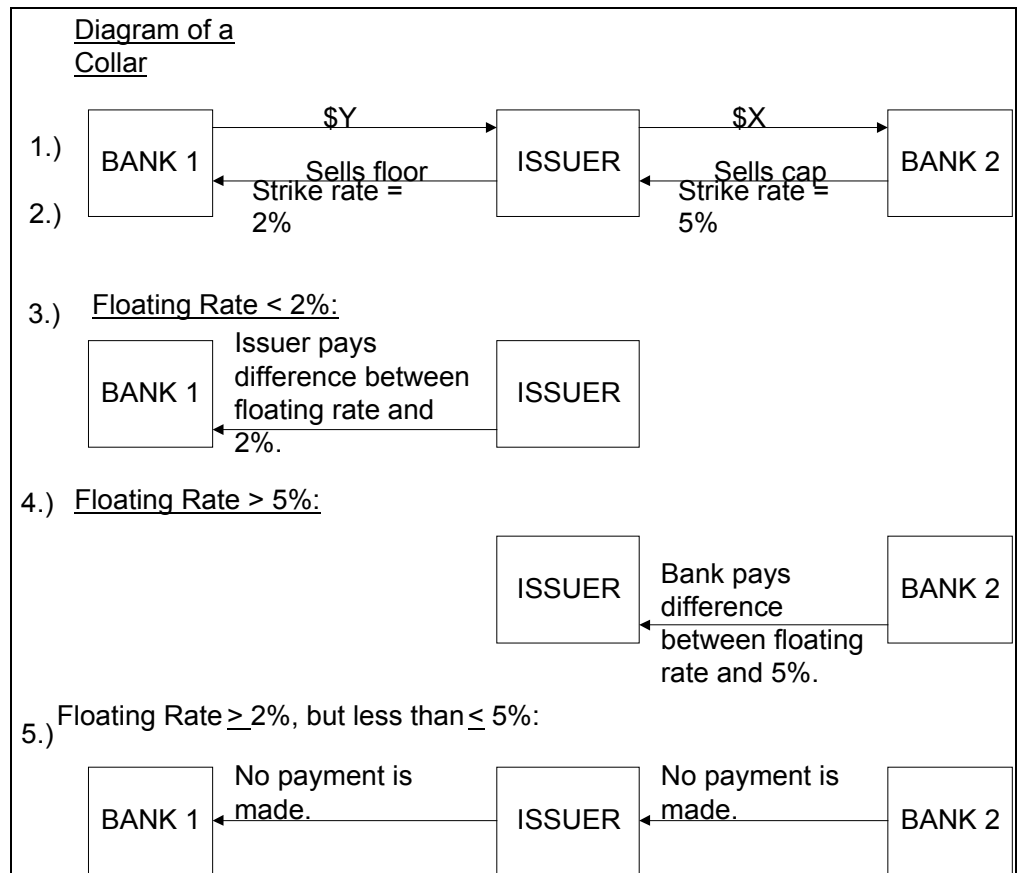
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## Types of Hedges, Continued

### Collar

A collar is an agreement where a party buys a cap and sells a floor, or sells a cap and buys a floor. By selling one contract, a party can partially or fully offset the cost of the other contract.

For example, by combining the transactions in the above two examples the issuer can participate in a transaction called a **collar**. The issuer buys a cap from Bank at a strike rate of five percent and pays a premium of \$X, and sells a floor to Bank at a strike rate of two percent and receives a premium of \$Y. The issuer has protected itself from floating interest rates going above five percent and, for \$Y received up front, sold the potential benefit of floating interest rates going below two percent to Bank. Issuer may purchase the cap from one entity and sell the floor to another entity. The premiums, \$X and \$Y, may be the same amount in certain cases, and thus no money is exchanged up front.



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## Types of Hedges, Continued

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### **Forward**

A forward is a contract between two parties for delivery of specified property at a fixed price at a future delivery date.

Issuer will enter into a forward contract in order to take advantage of current low interest rates in anticipation that interest rates may rise in the future.

For example, City has private activity bonds outstanding first callable on May 1, 2000. In 1995, fixed interest rates are lower than the rate on the bonds. Because the bonds are private activity bonds, City cannot advance refund the bonds but would like to take advantage of lower interest rates in 1995. City agrees with Company, an underwriting firm, that within 90 days prior to May 1, 2000, the City will issue fixed rate bonds bearing interest at X percent and deliver the bonds to Company. The City has entered into a forward contract with Company.

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### **Option**

An option is a contract which conveys to its holder the right, but not the obligation, to buy or sell the underlying security at a specified price on or before a given date.

For example, City has private activity bonds outstanding which are first callable on May 1, 2000, and have a yield of Y percent. In 1995, fixed interest rates are lower than the rate on the bonds. Because the bonds are private activity bonds, City cannot advance refund the bonds but would like to take advantage of lower interest rates in 1995. For an up-front premium, City sells Company, an underwriting firm, an option to require the City to issue bonds within 90 days prior to May 1, 2000, having a yield of X percent. X percent is less than Y percent. The City and Company agree to the time period when Company may exercise its option. If anytime during that time period fixed yield on long term debt is below X percent, Company may exercise its option and require the City to issue fixed rate bonds with a yield of X percent and deliver the bonds to Company. The City has entered into an option contract with Company.

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## Requirements of a Qualified Hedge

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**Introduction** Except as otherwise provided below, a qualified hedge is a contract that satisfies each of the requirements stated in the following sections.

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**Risk Reduction** Treas. Reg. section 1.148-4(h)(2)(i)(A) provides that to be a qualified hedge, the contract must be entered into primarily to modify the issuer's risk of interest rate changes with respect to the bond.

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**Special Rule for Fixed Rate Issues** Under Treas. Reg. section 1.148-4(h)(2)(i)(B), if the bond is part of a fixed rate issue, the contract must be entered into:

- no later than 15 days after the issue date of the issue, OR
- no later than the expiration of another qualified hedge with respect to the bonds of that issue.

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**No Significant Investment Element** Treas. Reg. section 1.148-4(h)(2)(ii)(A) provides that the hedge must not contain a significant investment element. The hedge must be "on-market." If the contract for an interest rate swap requires an up-front payment, it contains a significant investment element.

If the premium to be paid for a cap is less than on-market rate, the contract contains a significant investment element.

An interest rate cap does not contain a significant investment element if all payments to the hedge provider are periodic payments. The issuer's payments to the hedge provider must not be significantly front-loaded or back-loaded.

**(See Treas. Reg. section 1.148-4(h)(ii)(B))**

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## Requirements of a Qualified Hedge, Continued

### Contracts with Off-market Payments

According to Treas. Reg. section 1.148-4(h)(2)(i)(C), if the hedge provider makes a single payment to the issuer in connection with the acquisition of the contract, the issuer may receive such a payment and treat a portion of the contract as a qualified hedge if:

- the hedge provider’s payment and the issuer’s excess payments made above those it would have made had the contract been on-market are separately identified in a certification of the hedge provider, AND
- the excess payments are NOT included in calculating the yield on the hedged bonds.

### On-market and Off-market

Various terms describe hedges depending on the relationship between the price and the current market price of the hedge, as follows:

<b>If the price of the hedge is...</b>	<b>Then the hedge is ...</b>
Equal to the current market price	an “on-market” or “at-the-money” hedge.
Less than, or greater than, the current market price	an “off-market” hedge.
Less than current market price	“in-the-money” hedge.
More than current market price	“out-of-the-money” hedge.

### Parties to the Contract

Treas. Reg. section 1.148-4(h)(2)(iii) requires that the parties to the contract must be unrelated.

### Hedged Bonds

Treas. Reg. section 1.148-4(h)(2)(iv) requires that the contract must cover a discrete group of substantially identical bonds. For example, all bonds having the same interest rate, maturity, and terms. The contract may hedge for all or a pro rata of each interest payment of each bond in the issue.

When there is a qualified hedge relating to a bond issue, the bonds are often referred to as “hedged bonds.” Do not confuse this reference with “hedge bonds” described in IRC section 149(g). They have nothing to do with each other.

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## Requirements of a Qualified Hedge, Continued

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**Interest based Contract**      Treas. Reg. section 1.148-4(h)(2)(v) requires that the contract must be interest based.

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**Payments Closely Correspond**      Under Treas. Reg. section 1.148-4(h)(2)(vi), the payments received by the issuer must closely correspond in time to the payments being hedged on the hedged bonds or specific payments required to be made under the bond documents.

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**Identification**      Treas. Reg. section 1.148-4(h)(2)(ix) requires the issuer to identify the contract on its books and records not later than three days after the date on which the issuer and the hedge provider enter into the contract.

The identification must specify the hedge provider, the terms of the contract, and the hedged bonds.

The hedge must be noted on the first form relating to the hedged bonds that is filed with the Service. (Form 8038, 8038-T, etc.)

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## Accounting Rules for Qualified Hedges

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### **General**

Under Treas. Reg. section 1.148-4(h)(3)(i), payments made or received by the issuer under a qualified hedge are treated as payments made or received, as appropriate, on the hedged bonds. Accordingly, such payments are taken into account in calculating the yield on the hedged bonds.

The payments are reasonably allocated to the period to which the payments relate.

Payments made or received by the issuer include payments deemed made or received when a contract is terminated or deemed terminated.

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### **Termination Payments**

Treas. Reg. section 1.148-4(h)(3)(iv)(A) provides that a termination of a qualified hedge includes any sale or other disposition of the hedge by the issuer. If the issuer acquires an offsetting hedge, then the original hedge is terminated.

A deemed termination occurs if the hedged bonds are redeemed or when the hedge ceases to be a qualified hedge.

An assignment by the hedge provider of its remaining rights and obligations under the hedge to a third party, or a modification of the contract, is treated as a termination with respect to the issuer only if results in a deemed exchange and realization event under IRC section 1001.

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### **Payments**

Treas. Reg. section 1.148-4(h)(3)(iv)(B) provides that a payment made or received by an issuer to terminate a qualified hedge is treated as a payment made or received on the hedged bonds. Payments include loss or gain realized or deemed realized.

The payment is reasonably allocated to the remaining periods originally covered by the terminated hedge in a manner that reflects economic substance of the hedge.

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## Accounting Rules for Qualified Hedges, Continued

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### **Special Rule when Bonds are Redeemed**

Treas. Reg. section 1.148-4(h)(3)(iv)(C) provides that when the contract is deemed terminated due to redemption of the hedged bonds, the fair market value of the qualified hedge on the redemption date is treated as a termination payment.

Any payment or deemed payment received upon redemption reduces, but not below zero, the interest payments made by the issuer on the hedged bonds in the computation period ending on the termination date.

The remainder of the payment, if any, is allocated over the bond years in the immediately preceding computation period or periods to the extent necessary to eliminate the excess.

#### Example

County W issues \$100M principal amount of fixed rate bonds on January 1, 1999. The term of the bonds is 20 years. The interest rate on the bonds is six percent. County W enters into a 20-year swap agreement with Broker X on the issuance date. Under the swap agreement, County W agrees to pay Broker X a variable rate, based on the Bond Buyer index, on \$100M notional principal amount. Broker X agrees to pay County W six percent on the notional principal amount.

On June 1, 2002, the long-term fixed rates for comparable obligations have dropped to five percent. Broker X wants to terminate the swap agreement. County W and Broker X agree to do so if Broker X pays County W a termination payment. The termination payment is taken into account in reducing the yield on the bonds.

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### **Special Rules for Refundings**

Treas. Reg. section 1.148-4(h)(3)(iv)(D) provides that if the hedged bonds are redeemed using refunding bond proceeds, the termination payment is accounted for by treating it as a payment on the refunding issue, rather than the hedged bonds.

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## Accounting Rules for Qualified Hedges, Continued

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### Safe Harbor for Certain Terminations

According to Treas. Reg. section 1.148-4(h)(3)(iv)(E), a payment to terminate a qualified hedge does not result in the hedge failing to satisfy the general allocation rules for termination payments if:

- For a variable yield issue, a termination payment is taken into account as if it were a series of payments allocated to each date on which the hedge provider's payments would have been made. The sum of the present values of the deemed payments must equal the present value of the termination payment. The discount rate used to calculate the present values is the yield on the bonds determined without regard to the termination payment.
  - For a fixed yield issue, a payment is taken into account as a single payment when made.
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## Certain Variable Yield Bonds Treated as Fixed Yield Bonds

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**Introduction** If the issuer of variable yield bonds enters into a qualified hedge, the hedged bonds are treated as fixed yield bonds if the requirements in the following sections are met.

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**Maturity** Treas. Reg. section 1.148-4(h)(4)(i)(A) provides that:

- the term of the hedge is equal to the entire period during which the hedged bonds bear interest at variable interest rates, AND
- the issuer does NOT reasonably expect that the hedge will be terminated before the end of that period.

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**Payments Closely Correspond** Treas. Reg. section 1.148-4(h)(i)(B) provides that payments to be received under the hedge must correspond closely in time to the hedged portion of payments on the hedged bonds.

Hedge payments received within 15 days of the related payments on the hedged bonds generally so correspond.

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**Aggregate Payments Fixed** Under Treas. Reg. section 1.148-4(h)(i)(C), after taking into account all payments and receipts under the hedge and all payments on the hedged bonds, the issuer's aggregate payments are fixed.

Such payments must be determinable no later than 15 days after the issue date of the hedged bonds.

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## Certain Variable Yield Bonds Treated as Fixed Yield Bonds Bonds, Continued

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### Accounting

Treas. Reg. section 1.148-4(h)(4)(ii) provides that in determining yield on the hedged bonds, all of the issuer's payments on the hedged bonds and all payments made and received on the hedge are taken into account.

If payments on the bonds and payments on the hedge are based on variable interest rates that are substantially the same, the issuer may treat the variable interest rates as identical when calculating yield on the issue.

For example, assume that bonds bear interest at a variable rate determined weekly to permit the bonds to be remarketed at par. The issuer hedges the bonds wherein the issuer receives payments based on a short-term floating rate index which is substantially the same as, but not identical to, the weekly rate on the bonds. For purposes of calculating the yield on the bonds, the interest payments on the bonds are treated as equal to the payments received by the issuer under the swap.

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### Termination

According to Treas. Reg. section 1.148-4(h)(3)(iv), the issue of which the hedged bonds are a part is treated as if it were reissued as of the termination date of the qualified hedge for purposes of calculating yield on the hedged bonds.

The redemption price of the retired issue and the issue price of the new issue equal the aggregate values of all of the bonds of the issue on the termination date.

In computing the yield on the new issue, the termination payment is treated as if made and received on the new issue. Such payment is accounted for under Treas. Reg. section 1.148-4(h)(3)(iv).

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### Early Termination

Treas. Reg. section 1.148-4(h)(4)(iii)(B) provides that the general rules of paragraph (h)(4)(i) do not apply if the hedge is terminated or deemed terminated within five years after the issue date of the issue of which the hedged bonds are a part. However, this rule only applies for rebate purposes under Treas. Reg. section 1.148-3, and NOT for yield restriction purposes.

Therefore, the bonds are treated as variable yield bonds from the issue date.

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## **Certain Variable Yield Bonds Treated as Fixed Yield Bonds Bonds, Continued**

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**Certain  
Terminations  
Disregarded**

According to Treas. Reg. section 1.148-4(h)(4)(iii)(C), the issuer may disregard the termination, if based on the facts and circumstances (taking into account both the termination and any qualified hedge that immediately replaces the qualified hedge) there is no change in yield on the hedged bonds.

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## Anticipatory Hedges

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### **General**

Treas. Reg. section 1.148-4(h)(5)(i) provides that a contract does not fail to be a hedge under Treas. Reg. section 1.148-4(h)(2)(i) solely because it is entered into before the issue date of the hedged bond. However, the contract must meet one of the two categories described below.

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### **Hedges Expected to Close Near the Issuance Date**

Under Treas. Reg. section 1.148-4(h)(5)(ii), the issuer must reasonably expect to terminate the contract substantially contemporaneously with the issue date of the hedged bonds.

The amount paid or received, by the issuer in connection with the issuance of the hedged bonds to terminate the contract is treated as an adjustment to the issue price of the hedged bonds. It is also treated as an adjustment to the sale proceeds of the hedged bonds.

The amounts paid or received, or deemed paid or received, before the issue date are treated as paid or received on the issue date. Such amounts are equal to the future value of the payment or receipt on that date.

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### **Hedge Not Expected to Close Near the Issuance Date**

Treas. Reg. section 1.148-4(h)(5)(iii) applies if the issuer does not expect to close the hedge in connection with the issuance of the bonds.

If the contract is in fact not terminated substantially contemporaneously with the issue date of the hedged bonds, no payments made by the issuer before the issue date are taken into account. The payments and receipts under the hedge are, however, taken into account under the general rules.

If the contract is terminated in connection with the issuance of the hedged bonds, the amounts paid or received, or deemed to be paid or received, is treated as an adjustment to the issue price of the hedged bonds. It is also treated as an adjustment to the sale proceeds of the hedged bonds.

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## Anticipatory Hedges, Continued

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**Identification**      Treas. Reg. section 1.148-4(h)(5)(iv) provides that the identification required under paragraph (h)(2)(viii) must specify the following with respect to the hedged bonds:

- reasonably expected governmental purpose,
- issue price,
- maturity, and
- issue date.

It must also identify the manner in which interest is reasonably expected to be computed and how the anticipatory hedge meets the requirements of the regulations.

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**Treatment as Fixed Rate Bonds**      Treas. Reg. section 1.148-4(h)(5)(ii)(E) provides that the hedged bonds covered by an anticipatory hedge are treated as fixed rate bonds.

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**Commissioner's Discretion**      Under the general anti-abuse rule provided in Treas. Reg. section 1.148-10(e), the Commissioner may take into account the economic substance of a transaction in determining whether to treat a hedge as a qualified hedge.

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## Summary

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### **Review of Module B**

Module B discussed the calculation of bond yield when specific circumstances are present.

Prior to calculating the bond yield, the value of the bonds must be determined. The value of a plain par bond is its outstanding principal amount, plus accrued and unpaid interest. The value of a bond other than a plain par bond is its present value.

Generally, the yield on a fixed yield bond issue is computed by treated the bond as redeemed on the optional redemption date that produces the lowest yield.

When a variable yield issue is converted to a fixed yield issue, two bond yields are computed - one for the variable yield issue as of the redemption date, and one for the fixed yield issue treating the conversion date as the issuance date.

In computing bond yield, payments made for qualified guarantees and hedges are taken into account.

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### **Preview of Module C**

In order to determine if bond proceeds have been used to earn arbitrage, the yield on the investments must be calculated. Module C discusses the rules for computing this yield as well as for valuing investments.

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END OF MODULE B

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