

## **Learning Module 7: Yield and Yield Spread Measures for Fixed Rate Bonds**

Q.862 Which of the following is *most likely* correct regarding true and street convention yield? The true yield is:

- A. Always equal to the street convention yield.
- B. Never less than the street convention yield.
- C. Never higher than the street convention yield.

The correct answer is **C**.

The true yield-to-maturity is calculated using the actual calendar of weekends and bank holidays, which delays the time to pay.

Whenever the payment day falls on a weekend or holiday; payment is pushed to the next business day after the holiday or weekend. As a result, the true yield is always lower than the street convention yield. However, the difference between the true and street convention yield is always very small, perhaps 0.01% or less.

**A is incorrect.** The true yield is not always equal to the street convention yield. It can be equal if the payment date does not fall on a weekend or holiday. The true yield will be lower than the street convention yield when the payment date falls on a weekend or a holiday.

**B is incorrect.** The street convention yield does not include weekends and holidays. It assumes that payments are made on scheduled dates.

Therefore, the street convention yield value can never be less than the true yield.

***CFA Level I, Fixed Income, Learning Module 7: Yield and Yield Spread Measures for Fixed-Rate Bonds, LOS (a): Calculate annual yield on a bond for varying compounding periods in a year.***

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Q.864 Which of the following analysis is *most likely* used for segregating the yield-to-maturity into 'benchmark' and 'spread'?

- A. The break-even analysis.
- B. The yield-to-maturity analysis.
- C. The fixed-income security analysis.

The correct answer is **B**.

Typically, the benchmark rate is the yield-to-maturity on a government bond having the same, or close to the same, time-to-maturity. The spread is the difference between the yield-to-maturity on the new bond and the benchmark rate.

**A is incorrect.** Break-even analysis tells you how many units of a product must be sold to cover the fixed and variable production costs.

**C is incorrect.** Fixed income analysis is the process of determining the value of debt security based on an assessment of its risk profile, e.g., interest rate risk, risk of the issuer fails to repay the debt, market supply and demand for the security, call provisions, and macroeconomic considerations affecting its value.

**CFA Level I, Fixed Income, Learning Module 7: Yield and Yield Spread Measures for Fixed-Rate Bonds, LOS (b): Compare, calculate, and interpret yield and yield spread measures for fixed-rate bonds.**

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Q.2053 A 4-year semiannual corporate bond with a 3.5% coupon is priced at 104.12. This bond's modified duration and convexity are 3.75 and 45, respectively. The bond's credit spread narrows by 75 bps due to credit upgrade. The estimated return impact without convexity adjustment is closest to:

- A. -2.81%.
- B. 2.81%.
- C. 2.95%.

The correct answer is **B**.

$$\begin{aligned}\% \Delta \text{Full price of a bond} &= (-\text{Annual Modified Duration} \times \Delta \text{Yield}) \\ &\quad + \left(\frac{1}{2} \times \text{Annual Convexity} \times (\Delta \text{Yield})^2\right)\end{aligned}$$

$$\text{Return impact} = -(\text{Modified duration}) \times \text{Change in spread} = -3.75 \times (-0.75\%) = 0.0281 \text{ or } 2.81\%$$

Note: The bond's credit spread narrowed by 0.75%. Therefore, we have to include a negative sign before the credit spread.

**CFA Level I, Fixed Income, Learning Module 11: Yield Based Bond Duration Measures and Properties. LOS (a): Define, calculate, and interpret modified duration, money duration, and the price value of a basis point (PVBP)**

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Q.2501 For a 5-year, annual pay 7% bond that is priced at \$1,020.78, the YTM is *closest to*:

- A. 3.25%.
- B. 6.50%.
- C. 6.70%.

The correct answer is **B**.

We can calculate the YTM (discount rate) that satisfies this equality as:

N = 5; PMT = 70; FV = 1,000; PV = -1,020.78; CPT => I/Y = 6.5%

Note: To avoid getting “Error”, do not leave out the minus sign before The PV value.

**A is incorrect.** It represents the semi-annual yield to maturity.

**C is incorrect.** It assumes 10 periods (assumes semi-annual payments):

N = 10; PMT = 70; FV = 1,000; PV = -1,020.78; CPT => I/Y = 6.70%

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Q.2510 Consider a semi-annual-pay bond (periodicity of two) with an 8% YTM. The effective yield of this bond is *closest to*:

- A. 4.00%
- B. 8.16%
- C. 16.64%

The correct answer is **B**.

Effective yield is the yearly rate of return at a periodic rate of interest.

$$\text{Effective Yield} = \left(1 + \frac{i}{n}\right)^n - 1$$

Where  $i$  is the stated interest rate and  $n$  is the number of payments received in a year. A semiannual-pay bond (periodicity of two) with an 8% YTM has a yield of 4% every six months and an effective yield of  $1.04^2 - 1 = 8.16\%$

**A is incorrect.** It leaves out the power of 2;

$$EY = \left[1 + \frac{0.08}{2}\right] - 1 = 0.04 \text{ or } 4.00\%$$

**C is incorrect.** It assumes the following calculation;

$$EY = [1 + 0.08]^2 - 1 = 0.1664 \text{ or } 16.64\%$$

**CFA Level I, Fixed Income, Learning Module 7: Yield and Yield Spread Measures for Fixed-Rate Bonds, LOS (b): Compare, calculate, and interpret yield and yield spread measures for fixed-rate bonds.**

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Q.2511 Bond yields calculated using the stated coupon payment dates are referred to as:

- A. True yields.
- B. Effective yields.
- C. Street conventional yields.

The correct answer is **C**.

Bond yields calculated using the stated coupon payment dates are referred to as following the street convention. Because some coupon dates will fall on weekends and holidays, coupon payments will actually be made the next business day. The yield calculated using these actual coupon payment dates is referred to as the true yield. Effective yield is the return on a bond whose interests or coupon payments are reinvested at the same rate by the bondholder.

**A is incorrect.** The true yield-to-maturity is the internal rate of return on the cash flows using the actual calendar of weekends and bank holidays. The true yield is never higher than the street convention yield because weekends and holidays delay the time to pay.

**B is incorrect.** The effective yield is the return on a bond with interest payments (or coupons) reinvested at the same rate by the bondholder. Effective yield is the total yield an investor receives.

***CFA Level I, Fixed Income, Learning Module 7: Yield and Yield Spread Measures for Fixed-Rate Bonds, LOS (b): Compare, calculate, and interpret yield and yield spread measures for fixed-rate bonds.***

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Q.2512 A major drawback of the current yield is that:

- A. It considers only one source of return.
- B. It does not consider the time an investor has held an investment.
- C. It might not accurately represent an investment's true risk premium.

The correct answer is **A**.

The current yield is simple to calculate but offers limited information. This measure looks at just one source of return: a bond's annual interest income. It does not consider capital gains/losses or reinvestment income.

**B is incorrect.** It represents a limitation of holding period return.

**C is incorrect.** It represents a limitation of NPV.

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Q.2513 Is the following statement correct?

"A bond's true yield takes a discount or premium into account by assuming that any discount or premium declines evenly over the remaining years to maturity."

- A. Correct.
- B. Incorrect, because a bond's simple yield takes a discount or premium into account by assuming that any discount or premium declines evenly over the remaining years to maturity.
- C. Incorrect, because a bond's true yield takes a discount or premium into account by assuming that any discount or premium declines proportionately over the remaining years to maturity.

The correct answer is **B**.

A bond's simple yield takes a discount or premium into account by assuming that any discount or premium declines evenly over the remaining years to maturity.

***CFA Level I, Fixed Income, Learning Module 7: Yield and Yield Spread Measures for Fixed-Rate Bonds, LOS (b): Compare, calculate, and interpret yield and yield spread measures for fixed-rate bonds.***

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Q.2521 If we calculate an Option-Adjusted Spread (OAS) for a callable bond:

- A. It will be equal to the bond's Z-spread.
- B. It will be higher than the bond's Z-spread.
- C. It will be lower than the bond's Z-spread.

The correct answer is **C**.

If we calculate an OAS for a callable bond, it will be lower than the bond's Z-spread. The difference is the extra yield required to compensate bondholders for the call option. (Callable bonds have a higher yield because investors need extra compensation for reinvestment risk as the bonds can be called back by the issuer if interest rates fall.)

**A is incorrect.** The Z spread cannot be equal to the OAS for a callable bond as the formula for calculating OAS requires the deduction of Option value (in basis points per year) from the Z spread.

**B is incorrect.** From the formula,  $OAS = Z\text{-spread} - \text{Option value}$  (in basis points per year), the OAS cannot be higher than the Z spread.

**CFA Level I, Fixed Income, Learning Module 7: Yield and Yield Spread Measures for Fixed-Rate Bonds, LOS (b): Compare, calculate, and interpret yield and yield spread measures for fixed-rate bonds.**

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Q.2524 A 5-year corporate bond has a yield of 6.75% and its benchmark, the 5-year Treasury note, has a yield of 3.25%. Calculate the corporate bond's benchmark spread.

- A. 325 bps
- B. 350 bps
- C. 1000 bps

The correct answer is **B**.

If a 5-year corporate bond has a yield of 6.75% and its benchmark, the 5-year Treasury note, has a yield of 3.25%, the corporate bond has a benchmark spread of  $6.75\% - 3.25\% = 3.5\% = 350$  basis points (1 basis point = 1/10,000 or 0.01%)

**Note:** A benchmark spread is simply the yield difference between two bonds.

**A is incorrect.** It assumes that the Treasury note yield of 3.25% (=325 bps) is equal to the benchmark spread.

**C is incorrect.** It calculates the benchmark spread as  $6.75\% + 3.25\% = 10\% (=1000\text{bps})$ .

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Q.2526 An alternative to using government bond yields as benchmarks is to use rates for interest rate swaps in the same currency and with the same tenor as a bond. Yield spreads so obtained are called:

- A. G-spreads.
- B. I-spreads.
- C. Z-spreads.

The correct answer is **B**.

An alternative to using government bond yields as benchmarks is to use rates for interest rate swaps in the same currency and with the same tenor as a bond. Yield spreads relative to swap rates are known as interpolated spreads or l-spreads.

**A is incorrect.** G-spread is the yield difference between a corporate bond and a government bond, for example, a treasury bond.

**C is incorrect.** Z-Spread is a constant yield spread that, when added to yield at each point on the spot rate Treasury curve, makes the price of a bond equal to the present value of its cashflows.

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Q.3883 Which of the following would *most likely* be an example of the I-spread (interpolated spread)?

- A. The difference between the yield on a bond and the LIBOR.
- B. The difference between the yield on a Treasury bond and the yield on a corporate bond of the same maturity.
- C. The constant spread that makes the price of a security equal to the present value of its cash flows when added to the yield at each point on the spot rate Treasury curve.

The correct answer is **A**.

The I-spread stands for interpolated spread. It represents the difference between the yield on a bond and the swap rate (the interest rate applicable to the fixed leg in the floating-for-fixed interest rate swap, say, LIBOR). A higher I-spread means that a bond has higher credit risk.

**B is incorrect.** The difference between the yield on Treasury Bonds and the yield on corporate bonds of same maturity is the G-spread (Government-spread).

**C is incorrect.** The constant spread that makes the price of a security equal to the present value of its cash flows when added to the yield at each point on the spot rate Treasury curve is the Zero-volatility spread (Z-spread).

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Q.3885 A four-year, 6% semi-annual coupon payment corporate bond is priced at 110 per 100 of par value. Its yield to maturity is 7.87%, quoted on a semi-annual basis. The annual rate of the bond that can be used for direct comparison with otherwise comparable bonds that make quarterly coupon payments is *closest to*:

- A. 6.00%.
- B. 7.79%.
- C. 7.87%.

The correct answer is **B**.

$$\begin{aligned}(1 + (\frac{0.0787}{2}))^2 &= (1 + \frac{\text{APR}_4}{4})^4 \\ \text{APR}_4 &= [(1.0802)^{\frac{1}{4}} - 1] \times 4 \\ &= 7.794\%\end{aligned}$$

**A is incorrect.** It assumes the semi-annual coupon payment rate as the annual rate of the bond.

**C is incorrect.** It assumes the YTM as the annual rate of the bond.

**CFA Level I, Fixed Income, Learning Module 7: Yield and Yield Spread Measures for Fixed-Rate Bonds, LOS (a): Calculate annual yield on a bond for varying compounding periods in a year.**

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