

LOS 65.a

2011 CFA® Exam

SS 16

**Explain** the steps in the bond valuation process.

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## LOS 65.a

To value a bond, one must:

- Estimate the amount and timing of the bond's future payments of interest and principal.
- Determine the appropriate discount rate(s).
- Calculate the sum of the present values of the bond's cash flows.

**Identify** the types of bonds for which estimating the expected cash flows is difficult, and **explain** the problems encountered when estimating the cash flows for these bonds.



## LOS 65.b

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Certain bond features, including embedded options, convertibility, or floating rates, can make the estimation of future cash flows uncertain, which adds complexity to the estimation of bond values.



LOS 65.c

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**Calculate** the value of a bond and the change in value that is attributable to a change in the discount rate.

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## LOS 65.c

To compute the value of an option-free coupon bond, value the coupon payments as an annuity and add the present value of the principal repayment at maturity.

The change in value that is attributable to a change in the discount rate can be calculated as the change in the bond's present value based on the new discount rate (yield).



**Explain** how the price of a bond changes as the bond approaches its maturity date, and **calculate** the change in value that is attributable to the passage of time.



## LOS 65.d

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When interest rates (yields) do not change, a bond's price will move toward its par value as time passes and the maturity date approaches.

To compute the change in value that is attributable to the passage of time, revalue the bond with a smaller number of periods to maturity.



LOS 65.e

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**Calculate** the value of a zero-coupon bond.

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### LOS 65.e

The value of a zero-coupon bond calculated using a semiannual discount rate,  $i$  (one-half its annual yield to maturity), is:

$$\text{bond value} = \frac{\text{maturity value}}{(1 + i)^{\text{number of years} \times 2}}$$

**Explain** the arbitrage-free valuation approach and the market process that forces the price of a bond toward its arbitrage-free value, and **explain** how a dealer can generate an arbitrage profit if a bond is mispriced.




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## LOS 65.f

A Treasury spot yield curve is considered “arbitrage-free” if the present values of Treasury securities calculated using these rates are equal to equilibrium market prices.

If bond prices are not equal to their arbitrage-free values, dealers can generate arbitrage profits by buying the lower-priced alternative (either the bond or the individual cash flows) and selling the higher-priced alternative (either the individual cash flows or a package of the individual cash flows equivalent to the bond).



LOS 66.a

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**Explain** the sources of return from investing in a bond.

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## LOS 66.a

Three sources of return to a coupon bond:

- Coupon interest payments.
- Reinvestment income on the coupon cash flows.
- Capital gain or loss on the principal value.

LOS 66.b (Part 1)

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**Calculate** and **interpret** the traditional yield measures for fixed-rate bonds and **explain** their limitations and assumptions.

(Continued on next card)

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## LOS 66.b (Part 1)

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**Yield to maturity (YTM)** for a *semiannual-pay coupon bond* is calculated as two times the semiannual discount rate that makes the present value of the bond's promised cash flows equal to its market price plus accrued interest. For an *annual-pay coupon bond*, the YTM is simply the annual discount rate that makes the present value of the bond's promised cash flows equal to its market price plus accrued interest.

The current yield for a bond is its annual interest payment divided by its market price.

Yield to call (put) is calculated as a YTM but with the number of periods until the call (put) and the call (put) price substituted for the number of periods to maturity and the maturity value.

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**Calculate** and **interpret** the traditional yield measures for fixed-rate bonds and **explain** their limitations and assumptions.



## LOS 66.b (Part 2)

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(Continued from previous card)

The cash flow yield is a monthly internal rate of return based on a presumed prepayment rate and the current market price of a mortgage-backed or asset-backed security.

These yield measures are limited by their common assumptions that: (1) all cash flows can be discounted at the same rate; (2) the bond will be held to maturity, with all coupons reinvested to maturity at a rate of return that equals the bond's YTM; and (3) all coupon payments will be made as scheduled.

