Bond Intrinsic Value Computation

Case-let 1: Alpha Infrastructure Bond

Learning focus: Basic intrinsic value computation using annual coupons

Alpha Infrastructure Ltd. is a well-established firm specializing in large-scale public infrastructure projects, including highways, bridges, and other major projects. To finance a new long-term project, the company has issued a fixed-rate bond targeted at conservative investors seeking stable annual income. The bond has a face value of ₹1,000 and pays an annual coupon at an interest rate of 8 percent. The bond was settled on April 1, 2024, and will mature on April 1, 2035, at which time it will be redeemed at its face value. Given current market conditions, investors require a yield of 7.5 percent on bonds of similar risk. **On the settlement date, the bond is observed to be trading in the market at ₹1,080.** The bond follows the Actual/Actual day-count convention. For Excel valuation purposes, the take-home confirmation (basis) to be used is 0.

As a student of finance, you are required to estimate the intrinsic value of this bond using Excel's PRICE function. Based on your valuation, compare the intrinsic value with the observed market price and determine whether the bond is trading at a premium or discount, and briefly explain the economic intuition behind the result.

Case-let 2: Beta Energy Development Bond

Learning focus: Semi-annual coupons and redemption at the premium

Beta Energy Development Ltd. operates in the renewable energy sector and is expanding its solar and wind power capacity. To attract long-term investors, the company has issued a bond with semi-annual coupon payments and an additional incentive in the form of premium redemption. The bond has a face value of ₹5,000 and offers a coupon rate of 7.2 percent per annum, payable semi-annually. The settlement date is June 15, 2024, and the bond matures on June 15, 2036. At maturity, the bond will be redeemed at 105 percent of its face value. Investors currently demand a yield of 7.8 percent on comparable bonds. **On the settlement date, the bond is observed to be trading in the market at ₹4,750.** The bond follows the Actual/Actual basis, and the take-home confirmation number to be used is 0.

Your task is to compute the intrinsic value of this bond using the PRICE function in Excel and then compare it with the market price, explaining how premium redemption influences the bond's valuation when the required yield exceeds the coupon rate.

Case-let 3: Gamma Transport Finance Bond

Learning focus: Quarterly coupons and discount redemption

Gamma Transport Finance Ltd. specializes in financing commercial transport fleets and logistics infrastructure. The firm has issued a bond designed to provide investors with frequent income through quarterly coupon payments. The bond has a face value of ₹10,000 and pays a coupon at an annual rate of 8.4 percent. The bond was settled on September 30, 2024, and will mature on September 30, 2035. Unlike conventional bonds, this bond will be redeemed at a discount, with investors receiving only 95 percent of the face value at maturity. The required yield in the market for this bond is 8.1 percent. On the settlement date, the bond is observed to be trading in the market at ₹10,900. The bond uses the Actual/Actual day-count convention, and the appropriate take-home confirmation value is 0.

You are required to estimate the intrinsic value of the bond using Excel and then assess whether the bond appears overvalued or undervalued in the market, analysing how the combination of quarterly coupon payments and discount redemption affects the bond's price.

Case-let 4: Delta Housing Finance Bond

Learning focus: Monthly coupon payments

Delta Housing Finance Ltd. provides long-term housing loans and mortgage financing. To align its bond cash flows with its monthly loan repayments, the company has issued a bond that pays coupons every month. The bond has a face value of ₹25,000 and offers a coupon rate of 9% per annum, paid semiannually. The bond is settled on January 1, 2025, and matures on January 1, 2038, at which time it will be redeemed at its face value. Investors require a yield of 8.6 percent on this bond. On the settlement date, the bond is observed to be trading in the market at ₹27,100. The valuation is based on the Actual/Actual method, and the take-home confirmation number is 0.

Your task is to calculate the intrinsic value of this bond using Excel's PRICE function and compare it with the market price, explaining why, all else being equal, bonds with more frequent coupon payments tend to have higher intrinsic values.

Case-let 5: Epsilon Manufacturing Bond

Learning focus: Yield sensitivity analysis

Epsilon Manufacturing Ltd. operates in a cyclical manufacturing industry where interest rate movements significantly affect bond prices. The firm has issued a long-term bond with a face value of ₹50,000 and a coupon rate of 7.8 percent per annum, payable semi-annually. The bond was settled on July 1, 2024, and will mature on July 1, 2038, with redemption at 110 percent of its face value. The bond follows the Actual/Actual convention, and the take-home confirmation value is 0. On the settlement date, the bond is observed to be trading in the market at ₹56,200.

You are required to compute the intrinsic value of the bond at different required yields—specifically 6.5 percent, 7.0 percent, 7.5 percent, 8.0 percent, and 8.5 percent—using a one-

variable data table in Excel, and compare the intrinsic values with the observed market price to explain the inverse relationship between bond prices and yields.

Case-let 6: Zeta Logistics Bond

Learning focus: Coupon rate sensitivity

Zeta Logistics Ltd. is planning to issue bonds with alternative coupon structures and wants to understand how coupon rates influence bond valuation. The bond under consideration has a face value of ₹1,00,000 and will mature on March 1, 2034, having been settled on March 1, 2024. The bond pays annual coupons and will be redeemed at 97 percent of its face value. Investors demand a yield of 8 percent. On the settlement date, the bond is observed to be trading in the market at ₹92,000. The bond uses the Actual/Actual basis, and the take-home confirmation number is 0.

Your task is to calculate the intrinsic value of the bond for different coupon rates—6 percent, 7 percent, 8 percent, and 9 percent—using Excel and then explain how changes in the coupon rate affect the bond's intrinsic value relative to the required yield and observed market price.

Case-let 7: Eta Digital Services Bond

Learning focus: Effect of coupon payment frequency

Eta Digital Services Ltd. operates in the technology services sector and is experimenting with different bond structures. The company has issued a bond with a face value of ₹5,00,000, a coupon rate of 8.5 percent per annum, and redemption at face value. The bond was settled on August 15, 2024, and matures on February 15, 2036. The required yield is 8.2 percent. On the settlement date, the bond is observed to be trading in the market at ₹5,35,000. The bond follows the Actual/Actual convention with take-home confirmation number 0.

You are required to compute the intrinsic value of the bond assuming annual, semi-annual, and quarterly coupon payments and compare the intrinsic values with the market price to identify which payment frequency results in the highest bond value and why.

Case-let 8: Theta Renewable Power Bond

Learning focus: Long maturity with discount redemption

Theta Renewable Power Ltd. has issued a long-term bond to finance renewable energy infrastructure. The bond has a face value of ₹2,00,000 and pays quarterly coupons at a rate of 9.2 percent per annum. The bond was settled on October 1, 2024, and will mature on October 1, 2039. Due to regulatory constraints, the bond will be redeemed at only 92 percent of its face value. Investors require a yield of 9 percent. On the settlement date, the bond is observed to be trading in the market at ₹1,84,000. The bond is issued on the Actual/Actual basis, and the take-home confirmation number is 0.

You are required to estimate the intrinsic value of this bond and compare it with the market price, discussing the combined impact of long maturity and discount redemption on bond valuation.

Case-let 9: Iota Urban Development Bond

Learning focus: High coupon with discount redemption

Iota Urban Development Ltd. focuses on large urban infrastructure projects and issues bonds with attractive coupons to compensate investors for redemption losses. The bond has a face value of ₹75,000 and pays a semi-annual coupon at a rate of 10 percent per annum. The bond was settled on December 1, 2024, and matures on September 1, 2037. At maturity, it will be redeemed at 95 percent of its face value. The required yield is 8.8 percent. On the settlement date, the bond is observed to be trading in the market at ₹78,800. The Actual/Actual basis applies with take-home confirmation number 0.

Your task is to compute the intrinsic value of the bond and compare it with the market price, explaining how a high coupon rate can partially or fully offset the negative effect of discount redemption.

Case-let 10: Kappa Strategic Investment Bond

Learning focus: Integrated valuation and sensitivity analysis

Kappa Strategic Investments Ltd. caters to institutional investors and has issued a sophisticated bond with quarterly coupon payments. The bond has a face value of ₹3,00,000 and pays coupons at an annual rate of 8.75 percent. The settlement date is May 1, 2024, and the bond matures on November 1, 2037. At maturity, investors will receive 108 percent of the face value. The bond follows the Actual/Actual convention, and the take-home confirmation number is 0. The required yield is 9.25 percent. On the settlement date, the bond is observed to be trading in the market at ₹3,28,000.

You are required to compute the intrinsic value of the bond at the given yield and then perform a sensitivity analysis by estimating intrinsic values at different required yields, comparing the results with the market price to summarize key insights regarding yield sensitivity, coupon frequency, and premium redemption.