

Stat 274 — Winter 2024

Homework Assignment 7

Due: Thursday, April 4th on Learning Suite at 9:30 am

1. You will pay 2,318.63 for an n -year 2,000 par-value bond with a coupon rate of 10% compounded semiannually or pay 2,531.05 for an n -year 2,000 par-value bond with a coupon rate of 11% compounded semiannually. Assuming that you get the same yield on the two bonds, find the nominal annual yield rate (compounded semiannually) and n . [8.5%, 28]
2. You own a 3,000 par-value 12% bond with semiannual coupons. The bond will mature at the end of fourteen years. You decide a ten-year bond will be preferable. The current yield rate (for both bonds) is 6% convertible semiannually. You use the proceeds from the sale of the 12% bond to buy an 8% bond also with semiannual coupons maturing at par at the end of ten years. Find the face value of the 8% bond. [4081.54]
3. A 3,000 9% twelve-year bond with annual coupons is purchased with a discount of 57 and yields 9.1% if held to maturity. Find the price. [2997.95]
4. You buy a newly issued 1,000 20% ten-year bond, redeemable at 1,100 and having yearly coupons, for 1,400. You immediately take a constant amount D from each coupon and deposits it in another account earning 8% effective annual interest, so as to accumulate the full amount of the premium the moment after the final deposit. Find D . [20.71]
5. A 2,000 11% ten-year bond has semiannual coupons and is sold to yield 5.2% convertible semiannually. The discount on the bond is 83.28. Find the redemption amount. [4438.18]
6. You purchase a ten-year 1,000 bond with semiannual coupons for 982. The bond has a 1,100 redemption payment at maturity, a nominal coupon rate of 7% for the first five years, and a nominal coupon rate of $q\%$ for the final five years. Christie calculated that her annual effective yield for the ten-year period was 7.35%. Find q . [5.216%]
7. A 1,000 bond with a coupon rate of 8% has quarterly coupons and is redeemable after an unspecified number of years at 957. The bond is bought to yield 12% convertible quarterly. If the present value of the redemption amount is 231.59, find the purchase price of this bond. [736.93]
8. A 20,000 bond has annual coupons and is redeemable at the end of fourteen years for 22,600. It has a base amount equal to 18,450 when purchased to yield 6%. Find its base amount if it were purchased to yield 7%. [15814.29]
9. Joey purchased an n -year par-value 2,000 bond that had a coupon rate of 9% convertible quarterly. Todd purchased a par-value bond with an identical coupon rate but having a term of $2n$ years. The coupons that Joey and Todd received in the first n years were identical and both bonds had a yield rate of 6% convertible quarterly. Todd paid 233.02 more than Joey. Calculate n . Note that $4n$ must be an integer. [7.75]

10. Find and work 5 more practice problems on bonds. You can find those:

- In the online practice problems
- In the study manuals
- In the book
- Ask the TA's to write one
- In your purchased software (Infinite Actuary, Coaching Actuaries, Actex, etc.)