The purpose of this assignment is to make sure everyone understands how to value bonds and how to record bond-related journal entries prior to moving on from the topic and prior to testing your knowledge of bonds on Quiz 2. This homework contains 3 sets of questions, all of which are based on Goldman Sachs' <u>GS.SF</u> bond. If you are stuck, you can use the price chart on the linked Morningstar page to assist you.

This assignment will be graded on effort. <u>Show your work for each of the calculations, as your work is</u> what will be graded, not your final answers. You will receive feedback on this assignment prior to Quiz 2, so that you can be sure to understand the material.

NOTE: Rounding in the below answers is only done at the end. All calculations used full precision internally.

Question 1

Assume the GS.SF bond was issued on February 15, 2004¹. When the bond was issued it had a coupon rate of 6.345% and a yield of 6.345%, and the principal amount was \$2,750M. The bond pays its coupon semiannually and uses a 30/360 count date. The bond will mature after 30 years, on February 15, 2034. Note that Goldman Sachs uses a December 31st fiscal year end.

Required:

- A) What was the price of this bond at issuance? Record the journal entry for its issuance.
- B) What is the journal entry to record this bond's first coupon payment?
- C) What is the journal entry for the adjusting entry?
- D) What is the journal entry for the bond's second coupon payment?

Part A) No need for calculations. Since coupon rate = yield, the bond is priced at par.

Part B)

Coupon payment is
$$2750M \times \frac{6.345\%}{2} = 87.24M$$

Part C)

30/360: Aug 15 to Dec 31. Dec 31->Jan 1.

Month	August	September	October	November	December	January
Days	15	30	30	30	30	1

Days = 15 +30*4 + 1 = 136

Full coupon payment is 87.24MM. Interest accrued is $87.24M \times \frac{136}{180} = 65.92M$

Part D)

Partial period interest expense is Full period IE - Already recognized = 87.24M - 65.92M = 21.33M

¹ It was actually issued, effectively, on February 20th, 2004. This difference makes only a marginal difference on the bond issue price, which is essentially just a rounding error in this bond's case.

Question 2

Now, let's assume that the bond was instead issued on February 15, <u>2008</u>, and was still due on February 15th, 2034. On this date, the bond was trading at a yield of 6.89%. Assume everything else about the bond remains the same.

Required:

- A) What is the price of this hypothetical bond at issue? Record the journal entry for its issuance.
- B) What is the journal entry to record this bond's first coupon payment?
- C) What is the journal entry for the adjusting entry?
- D) What is the journal entry for the bond's second coupon payment?

Part A) Calculate bond price. CF=87.24M (calculated in part 1), r=0.03445, T=52, P=2,750M

Note that T=52 as the bond is now going from 2008 to 2034.

$$\frac{87.24M}{0.03445} \times \left[1 - \frac{1}{(1 + 0.03445)^{52}}\right] + \frac{2750M}{(1 + 0.03445)^{52}} = 2569.85M$$

Part B)

Interest Expense = Carry x yield/n = $2569.85M \times 0.03445 = 88.53M$

Discount CR = Interest Expense – CF = 1.29M

New carrying amount = 2569.85M + 1.29M = 2571.14M

Part C)

Full period interest expense = Carry x yield/n = $2571.14M \times 0.03445 = 88.58M$

Partial period interest expense = $88.58M \times \frac{136}{180} = 66.92M$

Part D)

Partial period interest expense = Full period IE – Already recognized = 88.58M - 66.92M = 21.65M

Question 3

Now, let's assume that the bond was instead issued on February 15, <u>2018</u>, and was still due on February 15th, 2034. On this date, the bond was trading at a yield of 4.649%. Assume everything else about the bond remains the same.

Required:

- A) What is the price of this hypothetical bond at issue? Record the journal entry for its issuance.
- B) What is the journal entry to record this bond's first coupon payment?
- C) What is the journal entry for the adjusting entry?
- D) What is the journal entry for the bond's second coupon payment?

Part A) Calculate bond price. CF=87.24M (calculated in part 1), r=0.023245, T=32, P=2,750M

Note that T=32 as the bond is now going from 2018 to 2034.

$$\frac{87.24M}{0.023245} \times \left[1 - \frac{1}{(1+0.023245)^{32}}\right] + \frac{2750M}{(1+0.023245)^{32}} = 3272.33M$$

Part B)

Interest Expense = Carry x yield/n = $3272.33M \times 0.023245 = 76.07M$

Premium DR = CF - Interest Expense = 11.18M

New carrying amount = 3272.33M - 11.18M = 3261.15M

Part C)

Full period interest expense = Carry x yield/n = $3261.15M \times 0.023245 = 75.81M$

Partial period interest expense = $75.81M \times \frac{136}{180} = 57.28M$

Part D)

Partial period interest expense = Full period IE – Already recognized = 75.81M - 57.28M = 18.53M