**Finance 6810: Fixed Income Investing**

**Assignment 4**

**Submitted By: Tony Trotter**

**A picture containing graphical user interface

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1. Use the given interest rate tree to price a 1.5-year coupon bond that pays semi-annual coupons with a coupon rate of 3% and face value of $100.

**Including final coupon using continuous compounding**

Diagram

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**Removing the final coupon and using discrete compounding**

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2. Calculate the price of a 1.5-year Cap with a strike rate of 3% and a notional value of $100.

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**T = 1.5 Calculations**

**T = 1 Calculations**

**T = .5 Calculations**

3. Find the price of a 1.5-year floor with a strike rate of 3% and a notional value of $100. (In this case here is a way that is quicker than valuing off of the tree

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**T = 1.5 Calculations**

**T = 1 Calculations**

**T = .5 Calculations**

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1. Use the tree above to price a 1.5-year bond that pays a semi-annual coupon with a coupon rate of 3%. This bond is callable, every six-months at a price of $100 starting in six-months from today (t = 0.5). Remember, the callable bond value is equal to the value of the non-callable bond less the call option value.

Double check how I accounted for the coupon

**This is assuming the final coupon is included in the bond price but not the option pricing tree and was continuously compounded.**

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.5

2. Add 0.001 to all of the rates on the tree and value the callable bond in question 1 using this adjusted interest rate tree.

**This is assuming the final coupon is included in the bond price but not the option pricing tree and is continuously compounded.**

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3. Subtract 0.001 from all of the rates on the tree and value the callable bond in question 1 using this adjusted interest rate tree.

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100.93𝑒−.040596∗.5

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4. Using your answers to questions 1, 2, and 3 of Part 2, find the modified duration of the callable bond. Recall, the modified duration of an asset can be approximated by:

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5. Use the same process outlined in questions 1, 2, 3, and 4 above to calculate the modified duration of the equivalent non-callable bond. Note, you should have already done much of the work needed to answer this question.