Introduction to Finance
Problem set to prepare for the Quiz 4

Problems. Show all work. Clearly indicate your answer to each question. For the purposes of this problem set assume that any 6-month period is exactly one-half of a year, and that any 3-month period is exactly one-fourth of a year. Prices are reported in decimal format.

Today is Thursday, May 14, 2019. You observe the following STRIPS quotes on Bloomberg: (STRIPS prices are quoted in percentage of par terms, on a decimal basis.)

Maturity	Bid	Ask
August 15, 2019	99.4282	99.4592
November 15, 2019	98.8287	98.8607
February 15, 2020	98.2080	98.2400
May 15, 2020	97.5895	97.6220
August 15, 2020	96.9426	96.9756
November 15, 2020	96.2371	96.2704
February 15, 2021	95.5199	95.5539
May 15, 2021	94.8190	94.8531
August 15, 2021	94.0794	94.1104
November 15, 2021	93.3454	93.3894
February 15, 2022	92.6751	92.7241
May 15, 2022	91.9155	91.9655
August 15, 2022	91.2075	91.2575
November 15, 2022	90.3374	90.3774
February 15, 2023	89.3432	89.3842
May 15, 2023	88.3380	88.3780

1. What are the quarterly discount factors over the next four years?

2. What is the yield curve–on a continuously-compounded basis, with quarterly increments, over the next four years?

3. What is the yield curve–on a bond-equivalent basis, with quarterly increments, over the next four years?

4. Consider an 28.5-year old 8.625% bond that matures on November 15, 2020.

   (a) According to these STRIPS prices, what is the value of this 8.625% November 15, 2020 bond?

      i. Build a replicating portfolio of the bond using the relevant STRIPS, and report the price of this replicating portfolio.

      ii. Compute the spot rates from the STRIPS and then discount the bond's future cash flows using these rates.

   (b) Suppose that you see this bond quoted on Bloomberg as: 108.04687 – 108.0625. Show how exactly the trades you make to make arbitrage profits. Show the cash flows on all dates from these trades. Ignore financing and short-selling costs and complexities.

   (c) Suppose that you see this bond quoted on Bloomberg as: 109.59375 – 109.609375. Show how exactly the trades you make to make arbitrage profits. Show the cash flows on all dates from these trades. Ignore financing and short-selling costs and complexities.

5. Consider a 7.25% bond that matures on February 15, 2020. Use the STRIPS quotes to obtain the value of this bond.

6. Consider a 7 year old, 10-year note that matures on May 15, 2022, with a coupon of 2.625%.

   (a) According to these STRIPS prices, what is the value of this 2.625% May 15, 2022 bond?

   (b) Suppose that this note were selling for 98.5 – 98.546875 ask. Demonstrate the arbitrage trade, and show the cash flows on each date from the position.

   (c) Suppose that this note were selling for 100-22 – 100-23. Demonstrate the arbitrage trade, and show the cash flows on each date from the position.

7. Today is Wednesday, November 14, 2018. You see the following two securities in Bloomberg (the quotes are in percentage terms):

Security	Maturity	Coupon	Bid	Ask
T Bond	May 15, 2019	10.5%	104.0625	104.09375
T Note	may 15, 2019	3%	100.15625	100.1875

   (a) What is the cc ytm on the bond?

   (b) What is the cc ytm on the note?

   (c) Does this suggest an arb may be possible?

   (d) Show an arb trade that profits from the relative prices of these 2 securities.