Name:

Student ID:

Section:

AP/ADMS 4540 Financial Management
Winter 2019

Mid-term Exam for All Sections

Time Limit: *2 hours*

Instructions: Answer all 5 questions of this exam in the spaces provided on the question sheets. **(If necessary, you may write on the back of the sheet).** You have 2 hours to work. The marks for each question are given. Please provide the marker with the greatest opportunity to give you credit by showing all calculations clearly. **Answers without clear calculations will be penalized**. Only normal writing instruments, a calculator and one 8.5"x11" or letter-size page list of **hand-written** formulas may be used to write this test. This **formula sheet must be submitted with the test**; otherwise you will automatically receive a mark of zero (0).

Question No.	Topic	Full Marks	Marks Obtained
1	Duration and Interest Rates	20	
2	Refunding	15	
3	ODA	15	
4	Risk and Return	30	
5	CAPM/APT/Canadian Tradition	20	

Question 1 on Duration and Interest Rates (20 marks)

a) You are presented with a 5-year semi-annual bond. This bond has a $1,000 face value and a 6% coupon per annum. Another annual 6-year bond similar bond with a 5% interest is priced at $904.67. Compute the duration for the semiannual bond. **(10 marks)**
b) What is the change of price change for this bond if market annual yield increases by 50 basis points? **(5 marks)**
c) What is the impact on this bond demand and yield if its liquidity increases? Also separately discuss the impact of an expected increased government deficit on the supply of bonds and their yield. **(5 marks)**

Note: one basis point is equivalent to one hundredth of a percent.

Question 2 on Refunding (15 marks)

Imagine, National Industrial Development Corporation (NIDC) is taking into consideration to offer a new $110, 000,000 bond issue to replace an outstanding $100,000,000 bond issue. The firm wants to do this business to take benefit of the decline in interest rates that has occurred since the original issue. The two bond issues are described in what follows. The firm is in the 30% tax bracket. In connection with the old bonds, the outstanding bonds have a one thousand dollars par value and an 8.5% coupon interest rate. They were issued 5 years ago with a twenty-year maturity and are callable at an 8.5 percent premium. With regard to the new bonds, the new bonds would have a fifteen-year maturity and a 7% coupon interest rate. It is anticipated that these bonds can be sold at par for a floatation cost of 1 percent of the total value of the issue. The firm believes a three-month-period of overlapping interest while it retires the old bonds. The firm can pay some of the costs by investing the issue at 4%, the short-term interest rate. The additional $10,000,000 from the new bond issue could be invested in a fifteen-year-project with an expected Net Present Value of $2,500,000. Should NIDC proceed with the refunding?

Required:

- Make a decision whether NIDC should proceed with the refunding.
- The answer and your response should consider detailed analysis of all the costs and benefits which are occurring as a result of the refunding; and
- Show all the required working steps.

Question 3 on ODA (15 marks)

The government of ON promised the following OSAP loan to the island of STUDENTS: **$1 billion**, to be **amortized** over **6 years** by **12 semi-annual payments**, after a **grace period of 4.5 years** during which ***no interest*** would be charged (i.e., **interest-free and payment-free grace period**). The government of ON would charge interest at a stated annual rate of **6 percent** after the 4.5-year grace period.
Due to the non-existent credit history and **un**employment of STUDENTS, the World Bank (currently led by interim President Ivanka) published the market rate of loans made to STUDENTS by private lenders to be **100 percent annually**, which she sees as generous with annualized payday loan rates above 200% and Venezuela suffering from over 1million% annual interest rates (and more suffering from more sanctions imposed by her father).

With the annual subsidized rate of 6%, annual market rate of 100% and 4.5-year grace period, determine first the implicit grant, in PV dollars ($ at time zero), and then the grant element, as a percent (%), of the $1 billion loan. **(5 marks)**
If the ON government decided that no loan repayment is required from STUDENTS, what would be the PV cost of this decision, first in terms of PV dollars ($ at time zero) and then as a percent (%) of the loan? Would you recommend the ON government convert the entire OSAP loan into an OSAP grant, i.e., make it ***tuition-free*** for STUDENTS? **(2 marks)**
Now suppose a new PC government takes over, and the PC government ***reduces the interest-free and payment-free grace period to 4 years***. How much would the PC government save, in PV dollars ($ at time zero), and then as a percent (%), of the $1 billion loan? Are the savings significant? **(2 marks)**
What would be the impact on STUDENTS if the PC government reverses the previous ON government's decision and reverts the OSAP grant back into an OSAP loan, and reduces the interest-free and payment-free grace period to 4 years? **(3 marks)** What would be the impact on the value of ON capital stock, given what we learnt from the Jaganathan and Wang (*Journal of Financ*e, 1996) paper? **(3 marks)**

Quick, what do you call spending more than USD $103 million to save CAD $6 million? **(no marks)**

Question 4 on Risk and Return (30 marks)

4a. From the *Youtube* videos you watched, based on William Sharpe's experience, would "A" students or "B" students be preferred by employers for non-academic jobs? Why? Also, why did William Sharpe think that academic finance before the 1960s was "moronic"? **(4 marks)**

4b. The following table gives some characteristics of two risky assets - stocks and bonds. Also shown are weights in the tangency portfolio P, which is constructed to be mean-variance efficient, i.e., it provides the highest expected return for its level of variance. Calculate the beta of stocks to the tangency portfolio P, β_{sp}. **(4 marks)**

Asset	Weigh in Tangency Portfolio P	Expected Return	Standard Deviation	Correlation With Stocks	Correlation With Bonds
Stocks	0.50	?	0.20	1.00	0.20
Bonds	0.50	?	0.10	0.20	1.00

4c. What is the "equity premium puzzle"? Explain the "equity premium puzzle" using historical statistics of the Canadian bond and stock markets, and how it was evident in Canada until the end of the last century and what happened after that until 2008, and then again until 2014. **(4 marks)**

4d. Suppose earnings before tax per share or EBT/share is $1 and the dividend payout rate is 100%. The return on equity or R_E is 10%. Suppose the corporate tax rate is 35% and there is no growth due to zero retained earnings (i.e., zero growth in dividends). The number of shares also remains constant. First, find the fundamental value of each share P_0. **(1 mark)** Now suppose the corporate tax rate is cut to 21%. Find the fundamental value of each share P'_0 now. **(1 mark)** What is the percentage change in the share price? **(1 mark)** What is causing the share price to increase? Are earnings growing? If not, why is the share price increasing? **(1 mark)**

4e. The tax cut and jobs act of 2017 (TCJA) which cut the U.S. corporate tax rate from 35% to 21% was passed jointly by the U.S. House and Senate on December 20, 2017. Now suppose investors already expected a corporate tax cut after President Trump was inaugurated in January 2017. From Assignment 1, the Adjusted Close AC of the S&P 500 index in January 2017 was 2,278.87 while the AC of the S&P/TSX index in January 2017 was 15,386. Also, from Assignment 1, the AC of the S&P 500 index in January 2018 was 2,823.81 while the AC of the S&P/TSX index in January 2017 was 15,951.7. Assignment 1 also showed the S&P/TSX and S&P 500 indexes are significantly positively correlated at the 1% level from 2014 to 2018. How could one explain the difference in returns of the S&P/TSX index and the S&P 500 index in the one year after the Trump inauguration? **(4 marks)**

4f. Now TCJA is expected to increase the U.S federal debt by more than $1.5 TRILLION over the next decade. Explain clearly what should happen to bond prices and bond yields when the U.S. federal debt increases. Besides future generations, who else is paying for the increase in the U.S. federal debt now? **(5 marks)**

4g. The UBS Billionaires Report (prepared by Swiss bank UBS and accountants at PwC) showed the world's billionaires became nearly 20% wealthier in 2017. The Bloomberg Billionaires Report showed the world's billionaires increased their wealth by about 20% in 2017, but then lost nearly 10% of their wealth in 2018. From what you learnt from lectures and the first assignment in ADMS 4540, provide a plausible explanation of the billionaires' about 20% increase in wealth in 2017. **(5 marks)**

Question 4 (continued)

Question 5 on Risk and Return (CAPM/APT/Canadian Tradition) (20 marks)

5a. Determine the equation that describes the equilibrium returns for the following portfolios: **(9 marks)**

Portfolio	Expected Return (%)	β_{i1}	β_{i2}
A	33.2	1.6	0.8
B	44.8	2.0	1.2
C	54.5	2.4	1.5

Hint: What is today's date – MM/DD/YY?

5b. Assume there is a portfolio D with β_{D1} = 1.8. What is the equilibrium return on portfolio D? What is the sensitivity of portfolio D to factor 2 β_{D2}? What is the relationship of portfolio D to factor 2? **(4 marks)**

5c. Suppose there is another portfolio E with the following characteristics: Actual Return = 52.5%; β_{E1} = 2.0 and β_{E2} = 1.5. Would you recommend investment in portfolio E? Why? **(2 marks)**

5d. From class discussion, we know that Lecture 4 ppt slide 62 contains many errors. Correct the last 2 erroneous statements found in slide 62. Include a short explanation for your corrections. **(5 marks)**

- The APT can handle multiple factors that the CAPM ignores
- A multifactor model like the APT is probably more reflective of reality