

NAME: _____ Student ID # _____

DO NOT TURN THIS PAGE UNTIL THE INSTRUCTION TO BEGIN IS GIVEN.

THIS IS A **TWO HOUR EXAM**. YOU MUST STOP WRITING IMMEDIATELY WHEN THE END OF THE EXAM IS ANNOUNCED – PLEASE REMAIN SEATED AND WAIT FOR THE PROCTORS TO COLLECT THE EXAMS.

YOU ARE ALLOWED TO LEAVE ONLY AFTER HALF AN HOUR HAS PASSED SINCE THE START OF THE EXAM.

YOU *ARE ALLOWED* TO LEAVE BEFORE THE EXAM IS OVER IF YOU FINISH MORE THAN FIVE MINUTES EARLY (TURN IN YOUR EXAM TO ONE OF THE PROCTORS ON YOUR WAY OUT).

DO NOT SEPARATE THE PAGES OF THIS EXAMINATION.

BE SURE TO PUT YOUR NAME AND STUDENT ID NUMBER ON THE TOP OF THE NEXT PAGE OF THIS EXAMINATION.

REMEMBER TO SHOW ALL WORK.

PLEASE FOLLOW ALL DIRECTIONS.

The next page contains general instructions.

There are instructions accompanying the individual problems.

Only your instructor is able to answer your questions.

There are limits to the types of questions I will answer.

GOOD LUCK

Name: _____

Student Number: _____

Finance FINA 395

Mid Term 1

Fall 2011

Instructor Parianen Veeren

October 12, 2011

70 points

This exam is composed of 5 multiple choice questions, 5 short problems and 4 multi-part word problems. Some of the sub-questions rely on information calculated in other parts of the question. Carry through errors will not be penalized. You are allowed a financial calculator and you may have one 8½×11 inch “formula sheet” with material on both sides. These sheets must be in human handwriting and may not be mechanically altered (i.e. reduced by a photocopier). Please **use ink** (neither red nor green) to answer the questions since questions not answered in ink will not be graded.

Show all work. Credit will not be given for answers without supporting information. Please limit the amount of extraneous information in your answers since it makes it difficult to ascertain your understanding. Use the backs of the pages for scratch. Do not write answers outside of the allotted space (i.e., **I do not read the backs of exams**).

Read through the exam before starting. Good luck!

Part 1 Multiple Choice _____ (10)

Short Problems _____ (20)

Part 2 Long Problems

Problem 1: _____ (10)

Problem 2: _____ (10)

Problem 3: _____ (10)

Problem 4: _____ (10)

Total: _____ (70)

- Q1. If a project has a net present value equal to zero, then:
- I. the present value of the cash inflows exceeds the initial cost of the project.
 - II. the project produces a rate of return that just equals the rate required to accept the project.
 - III. the project is expected to produce only normal profit.
 - IV. any delay in receiving the projected cash inflows will cause the project to have a negative net present value.
- A) II and III only
 - B) II and IV only
 - C) I, II, and IV only
 - D) II, III, and IV only**
 - E) I, II, and III only
- Q2. A previously purchased building, being used by another project, is to be used by a proposed project. This is an example of a(n):
- A) Sunk cost.
 - B) Opportunity cost.**
 - C) Variable cost.
 - D) Total cost.
 - E) None of the above.

- Q3. “We pay you \$18,000 a year for 25 years and thereafter you will pay us \$18,000 a year forever!” – reads the Highlander (who lives forever) in an ad. What must be the rate of interest (EAR) in order for this to be a fair deal, (i.e. the rate of interest that makes the present value of these two series of cash flows equal). Assume that all payments occur at the end of the year, so the Highlander receives the first payment at the end of year one and he makes his first payment at the end of year 26.
- A) No such interest rate exists
 - B) 0%
 - C) 2.81%
 - D) 3.18%
 - E) 3.36%
- Q4. 7% compounded monthly is equivalent to _____ compounded quarterly?
- A) 1.78%
 - B) 1.76%
 - C) 1.81%
 - D) 7.04%
 - E) 7.10%
 - F) 7.23%
- Q5. Efficient capital markets are financial markets:
- A) in which current market prices reflect available information.
 - B) in which current market prices reflect the present value of securities.
 - C) in which there is no excess profit from using available information.
 - D) all of the above.
 - E) none of the above.

Short Problem 1:

“A stock market crash is evidence supporting the Efficient Market Hypothesis”. Discuss. (4 points)

Stock market crash is evidence against efficient market hypothesis. EMH argue that prices reflect “fair price”. Stock market crash is more like “overreaction”.

Short Problem 2:

Why do some firms issue non-voting shares? The price of a voting share of Equalitarian Inc is the equal to the price of a non-voting share of Equalitarian Inc. Discuss. (4 points)

Firms issue non-voting shares to keep control of the corporation. The price of voting share is expected to be different from that of the non-voting share. Usually you expect the price of the voting share to be higher since it gives you the right to vote.

Short Problem 3:

“Profitability index and NPV always give the same accept/reject decision”. Discuss this statement and explain your answer.

This statement is wrong. PI cannot be use for mutually exclusive projects.

Short Problem 4:

How do corporate taxes affect cost of capital, value, and cost of equity of a levered firm? Please assume that taxes are the only imperfection in this world and interest payments are tax deductible. (4 Marks)

Cost of Capital decreases.

Value increases.

Cost of Equity increases but at a lower rate than it would have increased without taxes

Short Problem 5:

What are real options? Describe two of them. (4 points)

Real options are the adjustment that we can make after undertaking an investment. For instance we talk about three of them in class.

Option to abandon

Option to delay

Option to expand

Problem 1:

Junk Bond Corp. (JBC) has two different bonds and one class of shares currently outstanding. Bond A has a face value of \$100,000 and matures in 15 years. The bond makes no payments for the first three years, and pays \$9,500 semi-annually for the last 12 years. Bond B has a face value of \$180,000 and matures in 12 years. This bond makes no payments over its life except the payment of face value at maturity.

Starting end of this year, JBC is expected to pay \$2/share in dividend every 2 years for the next 7 years, after which the company is going to pay an annual dividend with a constant growth rate of 8% for the following 2 years. Subsequently, the dividend is expected to grow at a rate of negative 5% forever. The yield to maturity for bonds with similar risk is 14. The cost of equity for JBC is 18%.

- A. What is the current price of bond A? (3 points)

Bond A: $FV=100,000$, $PMT= 9,500$ every six months for last 12 years, $yield =7\%$

Value at Yr3 or t6 ($n=24$, $i=7$, $pmt =9500$, $fv=100000$)= $128,673.3350$

Current price = $128,673.3350/1.07^6 =\$85,740.476$

- B. What is the current price of bond B? What would be the price of bond B if it were to mature in 8 years instead? (3 points)

Current price of bond B = $180,000/1.07^{30} = \$23,646.081$

Price of bond B if mature in 8 yrs = $180,000/1.07^{16} = \$60,972.2276$

- C. What is the current price of Junk Bond's stock? (4 points)

$2/1.18 + 2/1.18^3 + 2/1.18^5 + 2/1.18^7 + 2*1.08/1.18^8 + 2*1.08^2/1.18^9 +$
 $[2*1.08^2*0.95/(0.18+0.05)]/1.18^9$

= $\$7.6872$

Problem 2:

- a) Toy2 Motors Inc wants to undertake a new project. It will cost \$825 today. The project will generate annual cash flow of \$150.00 forever. What is the NPV of this project? The appropriate discount rate is 20%. (3 points)

$$\text{NPV} = -825 + 150/.2 = -75$$

- b) Suppose after one year, new information will arrive and Toy2 will either have a cash flow of \$75 or \$ 225 forever with equal probability. After one year, you can abandon the project if NPV is negative. If you decide to abandon the project after one year, you will realize \$600 as salvage value. What is value of this option? (7 points)

$$\text{NPV} = -825 + 150/1.2 + (0.5*225/0.2 + 0.5*600)/1.2 = \$18.75$$

$$\text{Value of Option} = 18.75 - (-75) = \$93.75$$

Problem 3:

Oil Patch Corporation is considering the purchase of a new machine for \$300,000. The machine will reduce manufacturing costs by \$75,000 annually, growing at annual inflation rate of 3%. The machine belongs to asset class 43 with a CCA rate of 30%, and the company expects to sell the machine at the end of its 4-year operating life for \$100,000. The firm expects to be able to reduce net working capital by \$20,000 when the new machine has been installed (time=1) and keep lowering it by 5% a year, but required working capital will return to the original level when the machine is sold after 4 years. Oil Patch has marginal tax rate of 40%. It uses a 14% cost of capital to evaluate projects of this nature. Should Oil Patch invest in the new machine? (10 points)

Solution

Period	0.00	1.00	2.00	3.00	4.00
Discount factor	1.00	0.88	0.77	0.67	0.59
Cost savings		75,000.00	77,250.00	79,567.50	81,954.53
Taxes		- 30,000.00	- 30,900.00	- 31,827.00	- 32,781.81
OCFs		45,000.00	46,350.00	47,740.50	49,172.72
Working Capital		20,000.00	21,000.00	22,050.00	23,152.50
Change in WC		20,000.00	1,000.00	1,050.00	23,152.50
Investment	- 300,000.00				100,000.00
Cashflows	- 300,000.00	65,000.00	47,350.00	48,790.50	126,020.22
PV(Cashflows)	- 300,000.00	57,017.54	36,434.29	32,932.20	74,614.08
CCA Tax Shields					
PV perpetual tax shields		76,794.26			
PV lost tax shields		- 16,147.64			
PV of CCA tax shields		60,646.61			
NPV	- 38,355.27				

Problem 4:

You have three mutually exclusive projects Alpha, Beta and Gamma, with initial costs of \$7.5M, \$5M and \$6M respectively. The after tax cash flow for Alpha will be \$4.25M in the first year and \$3.25M in the second year. The after tax cash flow for Beta will be \$2.5M in year one and \$4.25M in the second year. The after tax cash flow for Gamma will be \$3.25M for the next three years. The interest rate is 15%. Using two different methods, show in which project you should invest. (10 points)

Solution

First calculate the NPV of each **1 point for each NPV**

$$\text{Alpha: } -7.5 + 4.25/1.15 + 3.25/1.15^2 = -1.3469\text{M}$$

$$\text{Beta: } -5 + 2.5/1.15 + 4.25/1.15^2 = \$0.3875$$

$$\text{Gamma: } -6 + 3.25/1.15 + 3.25/1.15^2 + 3.25/1.15^3 = \$1.4205$$

Since these are mutually exclusive and different time period we can either do the EAS or matching cycle or replacement chain **3 points each**

Since Alpha has a negative NPV we can drop it. **1 point here**

EAS for Beta is \$0.2384 and for Gamma \$0.6221. Therefore we choose Gamma

Under Matching cycle:

$$\text{Beta} = 0.3875 + 0.3875/1.15^2 + 0.3875^4 = \$0.9021$$

$$\text{Gamma} = 1.4205 + 1.4205/1.15^3 = \$2.3545$$

Again we choose Gamma

Under replacement chain

$$\text{Beta} = 0.3875 / (1.15^2 - 1) = \$1.2016$$

$$\text{Gamma} = 1.4205 / (1.15^3 - 1) = \$2.7271$$

Again we choose Gamma

Can also use incremental CF