Høgskolen i Østfold

Sensorveiledning

Course code: SFB13114 **ECTS credits:** 10	**Course:** Global Markets and Institutions
Date: 14/12/2018	**Duration:** 4 Hours (written examination)
Allowed aids: Pen, pencils, ruler, simple calculator	**Academic responsible:** Imtiaz Badshah
Grading: A-F	**Attachments:** formula sheet

The Examination:

The examination paper consists of 4 pages (including this page) and a Formula sheet (two pages hand written). Please check that the examination papers are complete before you start answering the questions.

The school exam entails 5 (five) problems, all of which should be answered/solved.

Please start answering each problem on a NEW page.

Read the text relating to each problem carefully. If something is unclear, you have to make realistic assumptions about how you understand the problem and how you decide to slove the problem. Any such assumptions must be clearly outlined.

Grading Deadline: 03/01/2019

LYKKE TIL/ BEST OF LUCK!

Problem 1 (20 %)

A. Assume you just deposited $1,000 into a bank account. The current real interest rate is 2% and inflation is expected to be 6% over the next year. What nominal interest rate would you require from the bank over the next year? How much money will you have at the end of one year? If you are saving to buy a stereo that currently sells for $1,050, will you have enough to buy it?

Solution: The required nominal rate would be:

$$i = i_r + \pi^e$$
$$= 2\% + 6\% = 8\%.$$

At this rate, you would expect to have $1,000 × 1.08, or $1,080 at the end of the year. Can you afford the stereo? In theory, the price of the stereo will increase with the rate of inflation. So, one year later, the stereo will cost $1,050 × 1.06, or $1,113. You will be short by $33.

B. Risk premiums on corporate bonds are usually anticyclical; that is, they decrease during business cycle expansions and increase during recessions. Why is this so?

Answer 3. During business cycle booms, fewer corporations go bankrupt and there is less default risk on corporate bonds, which lowers their risk premium. Similarly, during recessions, default risk on corporate bonds increases and their risk premium increases. The risk premium on corporate bonds is thus anticyclical, rising during recessions and falling during booms.

C. Consider the following two companies and their forecasted returns for the upcoming year:

		Fly-by-Night	Feet-on-the-Ground
Outcome 1	Probability	50%	100%
	Return	15%	10%
Outcome 2	Probability	50%	
	Return	5%	

What is the standard deviation of the returns on the Fly-by-Night Airlines stock and Feet-on-the-Ground Bus Company, with the return outcomes and probabilities described above? Of these two stocks, which is riskier?

Solution

Fly-by-Night Airlines

$$\sigma = \sqrt{P_1(R_1 - R^e)^2 + P_2(R_2 - R^e)^2}$$

$$R^e = P_1 R_1 + P_2 R_2.$$

$P_1 = 50\% = 1/2$, $R_1 = 15\% = 0.15$.

$P_2 = 50\% = 1/2$; $R_2 = 5\% = 0.05$.

$$\Rightarrow R^e = \tfrac{1}{2} \times (0.15) + \tfrac{1}{2}(0.05).$$

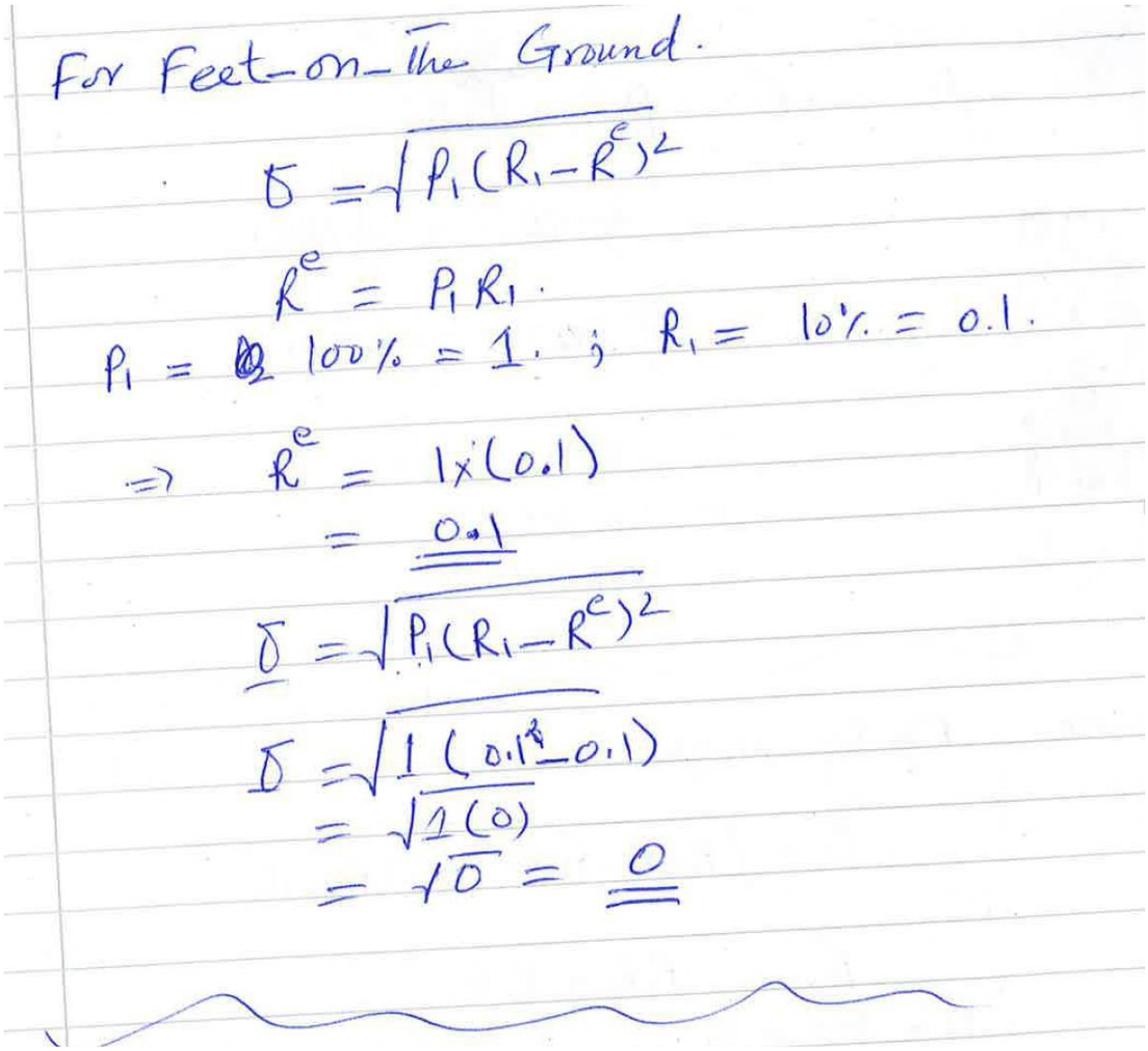
$$= \underline{\underline{0.1}}.$$

$$\sigma = \sqrt{\tfrac{1}{2}(0.15 - 0.1)^2 + \tfrac{1}{2}(0.05 - 0.1)^2}$$

$$\sigma = \tfrac{1}{2}(0.0025) + \tfrac{1}{2}(0.0025)$$

$$\sqrt{0.0025 + 0.00125}$$

$$= \sqrt{0.0025} = 0.05 = 5\%$$



Clearly, Fly-by-Night Airlines is a riskier stock because its standard deviation of returns of 5% is higher than the zero standard deviation of returns for Feet-on-the-Ground, which has a certain return.

Problem 2 (20 %)

A: "The independence of the Fed has meant that it takes the long view and not the short view." Is this statement true, false, or uncertain? Explain your answer.

Answer 13. Uncertain. Although independence may help the Fed take the long view, because its personnel are not directly affected by the outcome of the next election, the Fed can still be influenced by political pressure. In addition, the lack of Fed accountability because of its independence may make the Fed more irresponsible. Thus it is not absolutely clear that the Fed is more far sighted as a result of its independence.

B. The short-term nominal interest rate is 5% with an expected inflation of 2%. Economists forecast that next year's nominal rate will increase by 100 basis points, but inflation will fall to 1.5%. What is the expected change in real interest rates?

Answer: nominal rate = real rate + expected inflation

Year 1: 5% = real rate + 2%, or the real rate = 3%
Year 2: 6% = real rate + 1.5%, or the real rate = 4.5%

Real rates have increased by 150 basis points.

C. from chapter 10: Question 5.

What procedures can the Fed use to control the three-month Treasury bill rate? Why does control of this interest rate imply that the Fed will lose control of the money supply?

Answer 5. The Fed can control the interest rate on three-month Treasury bills by buying and selling them in the open market. When the bill rate rises above the target level, the Fed would buy bills, which would bid up their price and lower the interest rate to its target level. Similarly, when the bill rate falls below the target level, the Fed would sell bills to raise the interest rate to the target level. The resulting open market operations would of course affect the money supply and cause it to change. The Fed would be giving up control of the money supply to pursue an interest-rate target.

Problem 3 (20 %)

A. Why do businesses use the money markets?

Answer Businesses both invest and borrow in the money markets. They borrow to meet short-term cash flow needs, often by issuing commercial paper. They invest in all types of money market securities as an alternative to holding idle cash balances.

B. The price of $8,000 face value commercial paper is $7,930. If the annualized discount rate is 4%, when will the paper mature? If the annualized investment rate % is 4%, when will the paper mature?

Solution: Let N = when the paper matures

$$[(\$8{,}000 - \$7{,}930)/\$8{,}000)] \times (360/N) = 0.04$$
$$(\$70/\$8{,}000) \times (360/N) = 0.04$$
$$(\$0.00875) \times (360/N) = 0.04$$
$$(360/N) = 0.04 \times (1/\$0.00875)$$
$$(360/N) = 4.571429$$
$$N = 78.75 = 79 \text{ days}$$

Investment Rate:

$$[(\$8{,}000 - \$7{,}930)/(\$7{,}930)] \times (365/N) = 0.04$$
$$(\$70/\$7{,}930) \times (365/N) = 0.04$$
$$(365/N) = 0.04 \times (1/0.008827)$$
$$365/N = 4.53155$$
$$N = 80.55 = 81 \text{ days}$$

C. Consider the two bonds described below:

	Bond A	**Bond B**
Maturity	15 yrs	20 yrs
Coupon Rate (Paid semiannually)	10%	6%
Par Value	$1,000	$1,000

a. If both bonds had a required return of 8%, what would the bonds' prices be?
b. Describe what it means if a bond sells at a discount, a premium, and at its face amount (par value). Are these two bonds selling at a discount, premium, or par?
c. If the required return on the two bonds rose to 10%, what would the bonds' prices be?

Solution:

a. Bond A = $1,172.92
   Bond B = $802.07
b. Bond A is selling at a premium
   Bond B is selling at a discount
c. Bond A = $1,000

   Bond B = $656.82

Problem 4 (20 %)

A: What is the purpose of requiring that a borrower make a down payment before receiving a loan?

Answer The down payment means that if the borrower chooses not make payments on the loan, the borrower will suffer some financial loss. This increases the likelihood that the borrower will continue to make the promised payments.

B: If the bank you own has no excess reserves and a sound customer comes in asking for a loan, should you automatically turn the customer down, explaining that you don't have any excess reserves to loan out? Why or why not? What options are available for you to provide the funds your customer needs?

Answer No. When you turn a customer down, you may lose that customer's business forever, which is extremely costly. Instead, you might go out and borrow from other banks, corporations, or the Fed to obtain funds so that you can make the customer's loan. Alternatively, you might sell negotiable CDs or some of your securities to acquire the necessary funds.

C: NewBank started its first day of operations with $6 million in capital. $100 million in checkable deposits is received. The bank issues a $25 million commercial loan and another $25 million in mortgages, with the following terms:

- mortgages; 100 standard 30-year, fixed-rate with a nominal annual rate of 5.25% each for $250,000.
- commercial loan: 3-year loan, simple interest paid monthly at 0.75%/month.

If required reserves are 8%, what does the bank balance sheets look like? Ignore any loan loss reserves.

Solution

Assets		**Liabilities**	
Required Reserves	$ 8 million	Checkable Deposits	$100 million
Excess Reserves	$48 million	Bank Capital	$ 6 million
Loans	$50 million		

NewBank decides to invest $45 million in 30-day T-bills. The T-bills are currently trading at $4,986.70 (including commissions) for a $5,000 face value instrument. How many do they purchase? What does the balance sheet look like?

Solution: The bank can purchase $45 M/$4,986.70, which is about 9,024 T-bills. The actual cost is $44,999,980.80.

After the transaction, the balance sheet is:

Assets		Liabilities	
Required Reserves	$ 8 million	Checkable Deposits	$100 million
Excess Reserves	$ 3 million	Bank Capital	$ 6 million
T-bills	$45 million		
Loans	$50 million		

Problem 5 (20 %)

A On January 1st, a mutual fund has the following assets and prices at 4:00 p.m.:

Stock	Shares owned	Price
1	1,000	$ 1.97
2	5,000	$48.26
3	1,000	$26.44
4	10,000	$67.49
5	3,000	$ 2.59

Calculate the net asset value (NAV) for the fund. Assume that 8,000 shares are outstanding for the fund.

Solution:

$$\text{NAV} = \frac{\$1{,}970 + \$241{,}300 + \$26{,}440 + \$674{,}900 + \$7{,}770}{8{,}000} = \$119.05/\text{share}$$

An investor sends the fund a check for $50,000. If there is no front-end load, calculate the new number of shares and price/share. Assume the manager purchases 1,800 shares of stock 3, and the rest is held as cash.

Solution: With the $50,000, the value of the fund is now $952,380 + 50,000 = $1,002,380. Shares are sold at a price of $119.05, or 420 new shares. There are now 8,420 shares outstanding.

The new fund looks like:

Stock	Shares owned	Price
1	1,000	$ 1.97
2	5,000	$48.26
3	2,800	$26.44

4	10,000	$67.49
5	3,000	$ 2.59
cash	n.a.	$ 2408

B: Kio Outfitters estimated the following losses and probabilities from past experience:

Loss	Probability
$30,000	0.25%
$15,000	0.75%
$10,000	1.50%
$ 5,000	2.50%
$ 1,000	5.00%
$ 250	15.00%
$ 0	75.00%

What is the probability Kio will experience a loss of $5,000 or greater? If an insurance company offers a loss policy with $1,500 deductible, what is the most Kio will pay?

Solution Solution: Losses of less than $5,000 occur 95% of the time. So, 5% of the time, losses will be $5,000 or greater.

With a $1,500 deductible, Kio's expected losses are:

Loss	Probability
$28,500	0.25%
$13,500	0.75%
$ 8,500	1.50%
$ 3,500	2.50%
$ 1,000	5.00%
$ 250	15.00%
$ 0	75.00%

The expected (mean) loss if $475, which is the fair price of insurance.