i Front Page

Department of Economics

Examination paper for SØK2010 Banking

Examination date: 11.05.2024

Examination time (from-to): 09:00 – 13:00

Permitted examination support material:
Mathematical manual and calculator

Academic contact during examination: Yabin Wang
Phone: 46282679

Academic contact present at the exam location: No

OTHER INFORMATION

Get an overview of the question set before you start answering the questions.

Read the questions carefully and make your own assumptions. If a question is unclear/vague, make your own assumptions and specify them in your answer. The academic person is only contacted in case of errors or insufficiencies in the question set. Address an invigilator if you suspect errors or insufficiencies. Write down the question in advance.

Hand drawings/tablet*: The questions can be answered directly in Inspera and/or on handwritten sheets or tablet.

***Hand drawings:** At the bottom of the question you will find a seven-digit code. Fill in this code in the top left corner of the sheets you wish to submit. We recommend that you do this during the exam. If you require access to the codes after the examination time ends, click “Show submission”.

***Tablet:** Save the file on your computer and upload the file in the file-upload task at the end of the exam.

File upload: 15 minutes are added for file upload. The time is included in the time shown at the top left of the test, and the time is reserved for file upload.

Weighting: *Question 1: 30 points, Question 2: 30 points, Question 3 : 40 points*

Notifications: If there is a need to send a message to the candidates during the exam (e.g. if there is an error in the question set), this will be done by sending a notification in Inspera. A dialogue box will appear. You can re-read the notification by clicking the bell icon in the top right-hand corner of the screen.

Withdrawing from the exam: If you become ill or wish to submit a blank test/withdraw from the exam for another reason, go to the menu in the top right-hand corner and click “Submit blank”. This cannot be undone, even if the test is still open.

Access to your answers: After the exam, you can find your answers in the archive in Inspera. Be aware that it may take a working day until any hand-written material is available in the archive.

1 Exam

Fill in your answer here

Format

Words: 0

Maximum marks: 10

2 File upload

Upload your file here if you have used the tablet to draw

Upload your file here. Maximum one file.

All file types are allowed. Maximum file size is **50 GB**

Select file to upload

Maximum marks: 10

Question 1
Attached

SØK2010 Final Exam
Spring 2024

Question 1 (30 points)

Please write or type your answers clearly for the following questions.

1. Explain the problems created by "asymmetry of information" in the loan market. How can banks help to reduce the impact of this problem? (10 points)

2. What are mortgage backed securities (MBS) and explain their role in creating interest rate risk of banks. (10 points)

3. Explain in words what is "securitized banking". (10 points)

Question 2 (30 points)

Consider a borrower with zero capital who needs to raise \$1 million from 10,000 smaller lenders, and each lender has capital of \$100. Lenders do not observe the borrower's return directly, but can monitor the information by paying a cost. The borrower can retain any unreported return. Monitoring the borrower costs $c = \$200$. The value of the borrower's project will be $y = \$1.4$ million with probability $p = 0.8$ and $y = \$1$ million with probability $1 - p = 0.2$. The lenders have a required return of 5%.

1. Assume each lender monitors the borrower separately, in other words, the monitoring effort is duplicated. What is the total cost of monitoring by all lenders? (5 points)

2. Because duplicated monitoring is very expensive and the lenders decide not to monitor the borrower, but instead, the lenders now impose a penalty for low payments from the borrower which work as follows: if the borrower offers a payment lower than $\$f$ million, liquidation will occur. If the borrower offers a payment of at least f, the liquidation can be avoided. If liquidation occurs, the borrower and the lenders both get nothing. Would the lenders accept the contract if $f = 1$? Explain your answers. (5 points)

3. Following the same assumption as in question (2), calculate the value of f in the unmonitored debt situation that gives the lender her required return of 5%. Show your steps. (5 points)

4. Now suppose delegated monitoring can occur through the bank and the bank monitor two loans from two borrowers, whose returns are independently and identically distributed, the same as the return specified above. The bank now takes \$2 million in deposits from 20,000 lenders and lends it out to two different borrowers. The bank gives each borrower a debt contract with face \$F million and collects full amount F when the borrower has \$1.4 million. If the borrower has \$1 million, she will default by paying back only \$1 million because of being monitored by the bank.

   Complete the below table on borrowers' payments to the bank and the corresponding probabilities under 3 different scenarios: one loan defaults, two loan default and no loan defaults. (5 points)

   Borrowers' payment to the bank and related probabilities

Payment	Probability	Probability that payment is >= this value	Scenarios
			no loan defaults
			one loan defaults
			two loan default

5. Let B denotes the face value of bank deposits per loan, which means that the two-loan bank has total deposits of $2B$ and each deposit of \$100 has a face value $\frac{1}{10,000}B$. Assume the bank can pay its deposits when just one loan defaults (the bank will default on the deposits when both loan default).

   Calculate the expected payment received by all depositors. Based on your answer, what would the promised interest rate on bank deposits be? (5 points)

6. Based on the answer you got in (5), what should the face value of each loan F be? (5 points)

Question 3 (40 points)

Choose **one** correct answer for each of the following questions. Note that more than one choices, incorrect choice, or no choice will get zero point.

1. Which of the following statements is *not* true based on the model of Diamond and Dybvig (1983, Journal of Political Economy) discussed in class? (5 points)

   (A) Banks play the role of liquidity creation, converting illiquid assets into liquid asset

   (B) By issuing deposit contracts, banks can improve risk sharing among individuals that need to consume at different time horizons

   (C) For a fundamentally solvent bank, bank runs will not occur if depositors exhibit heard behaviors to withdraw from the bank

   (D) Regulatory measures, such as deposit insurance and lender-of-last-resort facilities, are important in mitigating the risk of banking panics

2. Based on the reading material "Wholesale Funding Dry-Ups" discussed in class, please choose the *correct* statement from below. (5 points)

   (A) The articles explores the fragility of wholesale funding of banks using transaction level data on repos in the European market

   (B) The article does not have a conclusive finding regarding the causes of market freeze in the wholesale funding market

   (C) The articles finds that funding dry-ups are supply-driven, predominantly affecting low-quality banks, indicating the presence of informed lenders

   (D) The articles finds that high-quality banks self-select out of the market due to severe adverse selection, causing dry-ups that are demand-driven

3. Which of the following statements about "Suspension of Deposit Convertability" is *not* true? (5 points)

   (A) It highlights the vulnerability of the banking system to liquidity crisis and the needs for interventions

   (B) It is a theoretical concept derived in the banking model as a defense mechanism against bank runs and it has never been deployed in reality

(C) Banks can temporarily halt the conversion of deposits into cash when withdrawals exceed a certain threshold

(D) The suspension of convertibility is not optimal if it result in some depositors being unable to withdraw their funds when needed

4. Based on the reading material "Managing the Balance Sheet through the Use of Repo 105" discussed in class, please select the *incorrect* statement from below. (5 points)

   (A) The financing or the loan remains on the balance sheet in a standard repo transaction

   (B) Lehman Brothers manipulated its leverage ratios by removing assets from its balance sheet

   (C) Lehman Brothers disclosed the use of Repo 105 to the board and the public, however, investors and the market were overly optimistic about the true state of Lehman

   (D) Lehman Brothers could not secure Repo 105 as sales by US law, so they relied on UK law to circumvent the regulation

5. Which of the following statements is *incorrect* about the provisions made in Basel III? (5 points)

   (A) Under Basel III, banks must improve both the quantity and quality of their capital

   (B) Basel III introduces both new liquidity measures and capital reforms

   (C) The minimum ratio of common equity to RWA is increased in Basel III, but liquidity measures are not imposed due to banks' shrinking profit margin

   (D) Basel III establishes a leverage ratio for banks to maintain certain level of Tier 1 capital

6. From the reading material "Norwegian covered bond - a rapidly growing market" discussed in class, please choose the *correct* statement from below. how and through which channels a drop in house prices would affect OMFs. (5 points)

(A) OMFs are more difficult to issue and trade because they are unsecured bank bonds

(B) Multiple defaults in the OMFs during the financial crisis in 2007- 2009 due to the housing market turmoil

(C) A drop in house prices will decrease mortgages' LTV which in turn reduces the eligible cover pool

(D) OMFs are issued not only in NOK but also in other currencies

7. Using the model from Stiglitz and Weiss (1981) on credit rationing introduced in class, which of the following statements is *correct*? (5 points)

   (A) Credit rationing can arise as lenders cannot increase the interest rate charged to borrowers, in fear of losing potential good borrowers and profit

   (B) Credit rationing cannot persist because lenders can clear the market by increasing interest rate

   (C) Credit rationing can occur as lenders cannot increase the interest rate charged to borrowers, due to regulatory ceiling imposed to reduce market distortion

   (D) Increased interest rates lead to higher cost of the loan, which gives less incentive to borrowers to invest in riskier projects

8. Consider an Entrepreneur who invests in a project with 0.5 million of his own wealth and borrows a loan of 1.5 million from the bank with an annual interest rate of r. That is a total amount of 2 million will be invested in his project. The project lasts one one year and its payoff structure is the following: if the market condition is good, the project gets return of $x = 4$ or $x = 1.4$ if the market condition is bad, with equal probability. At the end of one year, the Entrepreneur needs to pay back the bank. Assume there is no information friction, and the Entrepreneur's project realized return is known to both parties. What is the expected net payoff of the project for the Entrepreneur? (5 points)

   (A) 0.75 - 0.75r

   (B) 1.50 - 0.25r

   (C) 2.75 - 0.50r

   (D) 0