UNIVERSITY OF OSLO
DEPARTMENT OF ECONOMICS

Exam: **ECON4335 – The Economics of Banking**

Date of exam: Thursday, December 3, 2015 **Grades will be given: January 4, 2016**

Time for exam: 2:30 p.m. – 5:30 p.m.

The problem set covers 4 pages (incl. cover sheet)

Resources allowed:
- No resources allowed (except if you have been granted use of a dictionary from the Faculty of Social Sciences)

The grades given: A-F, with A as the best and E as the weakest passing grade. F is fail.

Exam ECON 4335 Economics of Banking, Fall 2015

Total: 30 points.

Problem 1. (8 points) A plot of agricultural land ensures an expected yearly yield of monetary value equal to x forever. Let r denote the risk-free interest rate.

(1.a) (2 points) What is the fundamental value of the plot?

(1.b) (3 points) Can the market price of the plot be different from the fundamental value if all traders are rational? Briefly justify your answer.

(1.c) (3 points) Let the plot of land be owned by a farmer. How does the market price of the plot affect the farmer's ability to access a loan?

Problem 2. (7 points) Define funding illiquidity and market illiquidity. How and through which channels might funding illiquidity and/or market illiquidity have contagious impact within the banking system?

Problem 3. (15 points) An economy has 3 risk-neutral agents: an investor, a bank, and an entrepreneur. The entrepreneur has a project of publicly observable size $I \in [0,1]$. The project requires an investment equal to its size. The entrepreneur has no capital and is protected by limited liability. Both investor and bank have enough capital to finance the entire project. With probability $1/2$ the project is good; with probability $1/2$ it is bad. A good project returns RI. A bad one returns 0. The type of the project is unknown to all agents. The bank can check the type of the investment, at cost C, before accepting to finance the project. If the entrepreneur requires part of the financing from the bank and part from the investor, then whenever either the bank or the investor refuses to finance, the project is not started and both bank and investor keep their capital.

The bank has an alternative use of its capital that ensures $\lambda > 1$ per unit invested. The investor has an alternative use of his capital that ensures 1 per unit invested. The entrepreneur asks the bank to lend $I_b \geq 0$ and promises to pay $d_b \geq 0$ if the project is good. The entrepreneur asks to the investor to lend $I_i \geq 0$ (where $I_i = I - I_b$) and promises to pay $d_i \geq 0$ if the project is good. Assume that $2 > R > 1$.

(3.a) (3 points) Suppose there is no bank. Are there values of I for which the project is financed? If your answer is yes, show for which values of I the project is financed. If your answer is no, discuss which assumption of the problem should be relaxed in order to ensure that the project is financed even without the bank.

Suppose now that the bank is present.

(3.b) (4 points) Show that the bank prefers to observe the investment's type before lending rather than lending without checking if and only if $I_b \geq \frac{2C}{\lambda}$. Can you explain why the size of I_b matters for the preference of bank?

(3.c) (4 points) Show that the bank prefers to check, and lend if the project is good, rather than using its capital for the alternative use without checking the project if and only if $d_b \geq 2C + \lambda I_b$. Do you have an intuition for why the size of d_b does matter here?

(3.d) (4 points) Assume that the entrepreneur proposes to the bank the following contract: $I_b = \frac{2C}{\lambda}$ and $d_b = 4C$. The rest of the investment cost $(I - I_b)$ must be financed by the investor. For this contract, the bank checks and finances only if the project is good. Assume for a moment that $C \leq \frac{(R-1)\lambda}{2(2\lambda-1)}$. Can you find a function $I(C)$ such that the project is financed if and only if $I > I(C)$? How do you interpret the result that a project is financed only if I is larger than some threshold $I(C)$? Assume now that $C > \frac{(R-1)\lambda}{2(2\lambda-1)}$: argue that in this case the project is never financed (remember: we assumed $I \geq 0$ and $I \leq 1$).