# *UNIVERSITY OF OSLO*
# *DEPARTMENT OF ECONOMICS*

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

Date of exam: Friday, December 12, 2014 **Grades are given: January 5, 2015**

Time for exam: 09.00 a.m. – 12.00 noon

The problem set covers 2 pages

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.

There are three problems, and you are asked to answer all of them. The weights are indicated.

### *Problem 1 (40 %)*

Banking activities exhibit a number of externalities. Outline some of these externalities (their causes and nature), and provide suggestions as to how they can be internalized.

### *Problem 2 (30 %)*

What determines the total volume of bank credit?

### *Problem 3 (30 %)*

A risk-neutral firm, with no equity and protected by limited liability, is going to invest in a project at a cost equal to one, with financing from a monopoly bank. After a loan has been granted, the firm can take some action or effort that will affect the probability distribution of returns from the project. This action is taken prior to the realization of the project.

Let there be two actions, as given by $e \in \{0,1\}$, with cost $c(e)$. Assume that $c(1) > c(0) = 0$.

The return from the project, $Y$, is random and verifiable, and given by $Y \in \{0, y\}$. The probability of the good outcome $(Y = y)$ is higher with effort than without, in the sense that

$$p = \Pr(Y = y \mid e = 1) > q = \Pr(Y = y \mid e = 0), \text{ with } 1 > p > q > 0.$$

(Pr stands for probability, and the distribution is conditioned on effort and known by both parties.)

a) Assume first that the bank is able to observe perfectly the borrower's effort choice. Assume that the borrower's outside option is zero. Derive the first-best rate of interest, both when the bank wants the firm to exert effort, and when no effort is optimal. If the bank's own funding cost is $1+f$, what are the conditions for the bank to prefer $e=1$?

Suppose now that the bank cannot observe the borrower's choice of effort, and suppose also that the bank wants to offer a contract that induces the borrower to exert effort.

b) Derive the rate of interest to be offered in this case.

c) When is it in the bank's interest to induce the borrower to choose $e=1$?

d) Explain why the rate of interest offered under b) is below the rate of interest if effort could be verified.