**Theory of Corporate Finance, ECN 5355**

**Lecture 6-7: Homework for 10 December**

**Problem 1 (Liquidity and Risk Management)**

Assume that the reinvestment need of a project at the intermediate stage is continuously distributed according to f() and expects a pay-off of pH R in the last stage, provided that the reinvestment need is met.

**a)** Which cut-off point for the reinvestment decision maximizes net present value?

**b)** Assume that the project provides a shirking option which results in a private benefit B and a decrease of the probability of success of p. Which cut-off point for the reinvestment decision maximizes pledgeable income? Which is the relationship between the cut-off point which maximizes NPV and the cut-off point which maximizes pledgeable income? – Show, why this is the case!

**c)** Assume that the initial borrowing need (I – A) is sufficiently small such that a cut-off point for the reinvestment in excess of the maximal pledgeable income can be realized. Demonstrate how you find the cut-off point which maximizes NPV under the condition that investors break even! Explain, which cases (continuation or non-continuation) can arise and what can be said about the interest of the borrower and lender.

**Problem 2 (Corporate Finance under Asymmetric Information)**

There are 1/3 good and 2/3 bad companies in the economy. Any firm may apply for a loan to finance a project which requires an investment of 56.

For a good company: p = 1 and Rgood = 70

For a bad company: q = 2/3 and Rbad = 90.

a) Determine the return at which the lender breaks even assuming that the shares with which good and bad companies apply for loans is the same as their share in the economy.

Verify whether this is a pooling equilibrium: i.e., show that all companies are willing to apply for loans.

b) Construct a separating equilibrium under the assumption that only bad companies apply! Show that this is actually an equilibrium!

c) The first time the project opportunity is announces, a company applies for a loan. What does this reveal about whether the company is good or bad?