

Economics 4905
 Financial Fragility and the Macroeconomy
 Fall 2017
 Problem Set 3
 Due Monday, October 22, 2018

1. Diamond-Dybvig Bank #1

The probability λ of being impatient is 35%. The utility function is:

$$u(c) = -\frac{1}{c}$$

The rate of return to the asset harvested late is 200%, i.e.,

$$R = 3$$

- (a) What is the depositor's *ex-ante* expected utility W as a function of c_1 , consumption in period 1, and c_2 , consumption in period 2?
- (b) Show that the depositor prefers consumption smoothing.
- (c) Why can't she insure on the market or self-insure against liquidity shocks?

Assume that her endowment is 100 and that she deposits her entire endowment in the bank.

- (d) What is her utility W in autarky?
- (e) What is her utility W under perfect smoothing, i.e. when $c_1 = c_2$?
- (f) What is the bank's resource constraint RC? Write this down precisely. Explain this in words.
- (g) What is the incentive problem? Write this down precisely and explain in words the incentive constraint IC.
- (h) Find the optimal deposit contract for this bank. What is W if there is no run?
- (i) Why is there a run equilibrium for this bank?
- (j) Calculate the following numerical values of *ex-ante* utility W and rank them in numerical ascending order: $W_{autarky}$, $W_{perfect\ smoothing}$, $W_{no\ run}$, W_{run} .
- (k) Assume that the run probability s is 10%. Will individuals deposit in this bank? That is, will they accept this banking contract? Explain.