



Diamond-Dybvig Model

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 - ▶ Utility depends on saver type

$$U(c_1, c_2) = \begin{cases} u(c_1) & \text{if impatient} \\ \beta u(c_1 + c_2) & \text{if patient} \end{cases}$$

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- ▶ Utility is strictly concave \Leftrightarrow strictly increasing $u'(c) > 0$ but at a decreasing rate $u''(c) < 0$.



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 - ▶ PDV of investment $>$ PDV of immediate consumption.
 - ▶ $R\beta > 1 \implies \beta u(R) > u(\beta R) > u(1)$ since utility is strictly concave.



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- ▶ θ is the probability that a saver is impatient.
- ▶ Key Mechanism:
 - ▶ Project requires 1 unit of money to start, two periods to complete.
 - ▶ If completed, payoff is R . Option to cancel project in period 1 and return investment.
 - ▶ Investments less liquid than savings, creates a liquidity mismatch.



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- ▶ Expected utility of agents $= \theta \cdot u(1) + (1 - \theta) \cdot \beta u(R)$.



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Social Planner Problem

Social planner wants to maximize expected utility of agents given a budget constraint.

$$\max_{c_1, c_2} \quad \theta \cdot u(c_1) + (1 - \theta) \cdot \beta u(c_2) \quad \text{s.t.} \quad (1 - \theta)c_2 \leq (1 - \theta c_1) \cdot R$$



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$$\implies \frac{\partial L}{\partial c_1} = \theta u'(c_1) - \lambda \theta R = 0$$



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Since $\beta R > 1 \implies u'(c_1) > u'(c_2) \Leftrightarrow c_1^* < c_2^*$.



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Since $\beta R > 1 \implies u'(c_1) > u'(c_2) \Leftrightarrow c_1^* < c_2^*$.

Moreover, $1 < c_1^* < c_2^* < R$ because $u(\cdot)$ is strictly concave.