



Chapter 9.3
Rehypotheication

Outline

- Problem and model assumptions
- Borrowing without rehypothecation
- Allowing rehypothecation
- Summary

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Re-using collateral

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Uncollateralized borrowing

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- ▶ Companies obtain their **investment return**

- ▶ $\Pi_C^H = ((1 + R) L \quad)$
 $\Pi_C^L = ((1 + R) L \quad)$

Uncollateralized borrowing

- ▶ Companies obtain their **investment return**, less the **repayment of the loan**

$$\begin{aligned}\Pi_C^H &= ((1 + R) L - (1 + r_L) L) \\ \Pi_C^L &= ((1 + R) L - (1 + r_L) L)\end{aligned}$$

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Uncollateralized borrowing

- ▶ Companies obtain their **investment return**, less the **repayment of the loan**, if **successful**
- ▶ If exerting effort, they also bear the **effort costs**
- ▶ $\Pi_C^H = \pi_H ((1 + R) L - (1 + r_L) L) - E$
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Collateralized borrowing

- ▶ Companies providing collateral will lose this if the company does not succeed
- ▶ $\hat{\Pi}_C^H = \pi_H ((1 + R) L - (1 + r_L) L) - (1 - \pi_H) C - E$
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- ▶ The bank will **invest the monies** raised

- ▶ $\hat{\Pi}_B = \left((1 + \hat{R}) \hat{L} \right)$

Bank incentives to rehypothecate

- ▶ The bank will **invest the monies** raised and be able to **repay this loan**

- ▶ $\hat{\Pi}_B = \left((1 + \hat{R}) \hat{L} - (1 + \hat{r}_L) \hat{L} \right)$

Bank incentives to rehypothecate

- ▶ The bank will **invest the monies** raised and be able to **repay this loan** only if their investment is **successful**

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$$\hat{\Pi}_B = \hat{\pi} \left((1 + \hat{R}) \hat{L} - (1 + \hat{r}_L) \hat{L} \right)$$

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- ▶ The bank will **invest the monies** raised and be able to **repay this loan** only if their investment is **successful**
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- ▶ $\hat{\Pi}_B = \hat{\pi} \left(\left(1 + \hat{R}\right) \hat{L} - (1 + \hat{r}_L) \hat{L} + \pi_H (1 + r_L) L \right)$

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- ▶ Companies only obtain their **investment return** and have to **repay their loan** if they are **successful**

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- ▶ Companies only obtain their **investment return** and have to **repay their loan** if they are **successful**
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- ▶ The company loses the **collateral** if it **itself is not successful** or the **bank is not successful**, and has to pay **effort costs**
- ▶ $\hat{\Pi}_C^H = \pi_H ((1 + R) L - \hat{\pi}(1 + r_L) L) - (1 - \pi_H \hat{\pi}) C - E$
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Minimum loan size to exert effort

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- ▶ Minimum loan size with rehypothecation is smaller if $L^{***} \leq L^{**}$
- ⇒ $E \geq E^* = (\pi_H - \pi_L)(1 + r_L)C$
- ▶ If effort costs are sufficiently high, **smaller loans** are sustainable

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- ⇒ $E \geq E^* = (\pi_H - \pi_L)(1 + r_L)C$
- ▶ If effort costs are sufficiently high, smaller loans are sustainable
- ▶ The possibility that the loan does not need to be repaid provides **additional incentives** to exert effort

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- ⇒ $E \geq E^* = (\pi_H - \pi_L)(1 + r_L)C$
- ▶ If effort costs are sufficiently high, smaller loans are sustainable
- ▶ The possibility that the loan does not need to be repaid provides additional incentives to exert effort, unless effort costs are **too high**

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- ▶ If loans are **not** under-collateralised, companies would agree to rehypothecation

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- ▶ The loss of collateral weighs **less** than the possibility of not having to repay the loan

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- ▶ Rehypothecation is optimal if banks have a **not-too-risky investment opportunity**

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The optimality of rehypothecation

- ▶ Rehypothecation is optimal if banks have a not-too-risky investment opportunity and loans are not over-collateralised
- ▶ Rehypothecation provides stronger incentives for companies to exert effort

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