Andreas Krause

Chapter 10.2.3

Evergreening

- Banks having provided a loan to a company have an interest in ensuring this loan is repaid.
- We will look at the incentives of such banks to provide additional loans to companies in distress with the aim of avoiding a default.

Extending new loans

Extending new loans

→
- Companies make investments and some of these investment might not be successful, or at least initially be not successful. In such a case a loan that is due to be repaid might not be repaid as the company doe snot have the necessary resources available.
- - If the bank were to insist on the repayment of the loan it would cause the company to fail.
  - In such a situation, the loan will be repaid only partially, if at all; this will impose losses on the bank.
- - To avoid realising such losses, banks might provide a new loan, allowing the company to make additional investments and generate profits.
  - These profits from the new investment are then used to repay the new loan, but also at least parts of the existing loan.
  - These additional repayments will reduce the losses to the bank.
- If the company would not obtain a loan from another bank not having provided loans previously, this is referred to a evergreening.

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- Companies may have loans outstanding they cannot repay with the resources available
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- Banks might extend a new loan for companies to generate additional profits, which will be put towards the repayment of the outstanding loan

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Company profits

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→ We can now look at the profits of a company requiring a loan after their initial investment has failed.

- We assume that a company has a loan which was used for an investment that failed; it is therefore not able to repay the existing loan.
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  - Assume now a bank provides an additional loan to the company.
  - This loan is invested, generating a return if successful.
  - The company uses these proceeds from the new investment now to repay both loans, the existing loan and the new loan.
- *Formula*
- The company will accept the new loan if this is profitable to do so.

⇒ This condition gives us a maximum loan rate for this new loan.

→ We will now look at the incentives of the existing bank to provide such a loan.

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Company profits

- A company has a loan outstanding which it cannot repay
- The bank provides a new loan, which the company invests

- $\Pi_C = \pi \left((1+R)L \qquad\qquad\qquad\qquad \right)$

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Company profits

- A company has a loan outstanding which it cannot repay
- The bank provides a new loan, which the company invests and uses these proceeds to repay both loans
- $\Pi_C = \pi \left((1 + R)L - (1 + r_L) \left(L + \hat{L} \right) \right)$

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$\Rightarrow$ $1 + r_L \leq 1 + r_L^* = (1+R)\frac{L}{L+\hat{L}}$

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Loan rate if both loans are repaid

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→ We will first consider the case where the new loan allows the company to repay both the existing and new loan.
- The revenue the new investment generates will now enable the company to repay the existing loan and the new loan, provided the new investment is successful.
- The bank will obtain the new and existing loans back, provided the new investment is successful and they repay the deposits they used to fund these loans. The existing loan is assumed to include any accumulated interest.
- If the bank would not be granting the new loan, they would lose the existing loan. Hence if the profits from granting a new loan are larger, the loan will be granted.

⇒ This condition gives us a minimum loan rate the bank will need to charge.
- The bank has a minimum loan rate it needs to charge to offer a loan, while above we have seen that the company has a maximum loan rate it can be charged in order to take up the loan. A loan rate can be agreed if the maximum of the company is above the minimum of the bank.

⇒ This condition can be solved such that there is a maximum loan amount that can be currently outstanding.

→ We can now turn to the case where the new loan would not allow the company to repay both loans fully.

Loan rate if both loans are repaid

- Assume the revenue of the investment is large enough to repay the both loans

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Loan rate if both loans are repaid

- Assume the revenue of the investment is large enough to repay the both loans
- $\Pi_B = \pi \left(1 + r_L\right) \left(L + \hat{L}\right) - \left(1 + r_D\right) \left(L + \hat{L}\right)$

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$\Rightarrow 1 + r_L \geq 1 + r_L^{**} = \frac{(1+r_D)\left(L+\hat{L}\right)-\hat{L}}{\pi\left(L+\hat{L}\right)}$

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$\Rightarrow$ $\hat{L} \leq \hat{L}^{*} = \frac{\pi\left(1+R\right)-\left(1+r_D\right)}{r_D} L$

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- If the bank would not be granting the new loan, they would lose the existing loan. Hence if the profits from granting a new loan are larger, the loan will be granted.

⇒ This condition gives us a minimum loan rate the bank will need to charge.

- The bank has a minimum loan rate it needs to charge to offer a loan, while above we have seen that the company has a maximum loan rate it can be charged in order to take up the loan. A loan rate can be agreed if the maximum of the company is above the minimum of the bank.

⇒ This condition can be solved such that there is a maximum loan amount that can be currently outstanding.

→ We can now turn to the case where the new loan would not allow the company to repay both loans fully.

Loan rate if both loans cannot be repaid

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→ The new loan might not be sufficient to repay both loans fully.

- The revenue the new investment generates might not be enough to repay both loans, even if the new investment is successful.
- In this case the bank will obtain the full revenue from the company, and as before have to repay the deposits used to fund both loans.
- f the bank would not be granting the new loan, they would lose the existing loan. Hence if the profits from granting a new loan are larger, the loan will be granted.

⇒ This can be directly transformed into the maximum size of the outstanding loan.

- Thus for an outstanding loan up this size a new loan can be agreed. The loan rate is irrelevant in this case as the loan is never repaid fully; therefore a loan rate that meets the requirements of the company can easily be agreed.

→ The maximum size of the outstanding loan is identical whether the company is able to repay the new loan in full or only partial. In both cases, the existing bank would grant a new loan to reduce or eliminate any losses they would otherwise make.

Loan rate if both loans cannot be repaid

- If the revenue is not enough to repay both loans, the bank will seize all revenue
- $\Pi_B = \pi\left(1+R\right)L - \left(1+r_D\right)\left(L+\hat{L}\right)$

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Loan limits

- → If the new loan does not allow both loans to be repaid fully, the existing and new bank have to share the repayments made. We assume that both loans have identical seniority.
- ▶ If the two loans are only repaid partially, the repayments are shared equally in the sense that the g=fraction of repayments received are based on the outstanding loan amounts.
- ▶ The banks seize the full return on the investment and then the new bank obtains its fraction of these proceeds and repay the deposits used to finance the loan.
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- If both loans cannot be repaid fully, the new bank obtains the revenue of the company pro-rata
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Lending decisions

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→ We can now compare the provision of loans if an outstanding loan cannot be repaid.

- If the outstanding loan is small, then new and existing banks would provide a new loan to the company in order to recover from the failed investment.
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  - Other creditors, often with a lower seniority, might be unaware of the impending failure of the company and there provide additional loans.

→ Evergreening happens as existing banks seek to recover losses on outstanding loans due from companies that are unable to repay them. This desire to reduce losses makes them more willing to extend loans than banks without this exposure to outstanding loans.

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This presentation is based on
Andreas Krause: Theoretical Foundations of Banking, 2025

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