

## Chapter 11.2.3 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

- ▶ Companies may have loans outstanding they cannot repay with the resources available
- ▶ This makes them subject to liquidation if the bank insists on loan repayment, causing the bank losses
- ▶ Banks might extend a new loan for companies to generate additional profits, which will be put towards the repayment of the outstanding loan, reducing bank losses
- ▶ Extending such loans is referred to as evergreening

# Extending new loans

- If a company has obtained a loan which is due to repay, the bank can insist on it being repaid or it can extend an additional loan.
- ▶ 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 does not 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 as evergreening.
- We will now look under which conditions such evergreening loans are given by banks.

# 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
  - ▶  $\Pi_C = \pi \left( (1 + R)L - (1 + r_L) (L + \hat{L}) \right)$
  - ▶ Companies accept loans if  $\Pi_C \geq 0$
- $\Rightarrow 1 + r_L \leq 1 + r_L^* = (1 + R) \frac{L}{L + \hat{L}}$

- 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.
- ▶
  - 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.
- ▶ [ $\Rightarrow$ ] 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.

## Loan rate if both loans are repaid

- ▶ Assume the revenue of the investment is large enough to repay the both loans
  - ▶  $\Pi_B = \pi (1 + r_L) (L + \hat{L}) - (1 + r_D) (L + \hat{L})$
  - ▶ Banks grant the new loan if they are better off than losing the outstanding loan:  
 $\Pi_B \geq -\hat{L}$
- $$\Rightarrow 1 + r_L \geq 1 + r_L^{**} = \frac{(1+r_D)(L+\hat{L})-\hat{L}}{\pi(L+\hat{L})}$$
- ▶ A loan is agreed if  $1 + r_L^* \geq 1 + r_L^{**}$
- $$\Rightarrow \hat{L} \leq \hat{L}^* = \frac{\pi(1+R)-(1+r_D)}{r_D} L$$

# Loan rate if both loans are repaid

- 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 cannot be repaid

- ▶ If the revenue is not enough to repay both loans, the bank will seize all revenue
  - ▶  $\Pi_B = \pi (1 + R) L - (1 + r_D) (L + \hat{L})$
  - ▶ Banks grant the new loan if they are better off than losing the outstanding loan:  
 $\Pi_B \geq -\hat{L}$
- $$\Rightarrow \hat{L} \leq \hat{L}^* = \frac{\pi(1+R)-(1+r_D)}{r_D} L$$
- ▶ A new loan is agreed if  $\hat{L} \leq \hat{L}^*$

# Loan rate if both loans cannot be repaid

- 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.
  - ▶ 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 can be directly transformed into the maximum size of the outstanding loan.
  - ▶ Thus for an outstanding loan up to 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 from another bank

▶ A new bank would not be concerned about the outstanding loan, but only the new loan granted

▶ Assume all loans can be repaid fully:  $(1 + R) L \geq (1 + r_L) L + \hat{L}$

$$\Rightarrow \hat{\Pi}_B = \pi (1 + r_L) L - (1 + r_D) L$$

▶ Banks grant the new loan if this is profitable:  $\hat{\Pi}_B \geq 0$

$$\Rightarrow 1 + r_L \geq 1 + \hat{r}_L^* = \frac{1 + r_D}{\pi}$$

▶ A loan is agreed if  $1 + r_L^* \geq 1 + \hat{r}_L^*$

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

# Loan from another bank

- We can now compare the result of an existing bank providing a loan to that of a new bank, which has not granted a loan.
- ▶
  - A new bank has no existing loan to be concerned about as the outstanding loan imposes losses only on the existing bank.
  - A new bank is only considering the repayment of their own, new, loan.
- ▶ Initially we again assume that the new loan can repay both loans fully. Thus the return would repay the new loan and the existing loan.
- ⇒ The new bank will only be concerned about the repayment of the new loan and the costs its funding imposes/
- ▶ Granting such a loan is profitable as long as the new bank makes a profit.
- ⇒ This condition will impose a minimum loan rate the bank needs to charge for the new loan.
- ▶ As before, this minimum loan rate of the bank must be less than the maximum loan rate to achieve a loan rate that both find acceptable.
- ⇒ Solving this condition, provides us with a maximum size of the outstanding loan for which a new loan would be granted.
- We have now obtained the maximum size of the outstanding loan for which the new bank would grant a new loan if the new loan allows both loans to be fully repaid. We now turn to the case where this is not possible.

# Loan limits

- ▶ If both loans cannot be repaid fully, the new bank obtains the revenue of the company pro-rata
  - ▶  $\hat{\Pi}_B = \pi (1 + R) \frac{L}{L + \hat{L}} L - (1 + r_D) L$
  - ▶ Banks grant the new loan if this is profitable:  $\hat{\Pi}_B \geq 0$
- $\Rightarrow \hat{L} \leq \hat{L}^{**} = \frac{\pi(1+R)-(1+r_D)}{1+r_D} L$

- 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.
- ▶ If these profits are positive, the new bank would provide a loan.
- ⇒ This condition is fulfilled if the outstanding loan amount is not too large.
- 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 new bank would grant a new loan for outstanding loans not being too large. The maximum size if the outstanding loan is smaller for new banks than for existing banks.

# Lending decisions

- ▶  $\hat{L} \leq \hat{L}^{**}$ : Other banks would provide a loan the company is creditworthy
- ▶  $\hat{L}^{**} < \hat{L} \leq \hat{L}^*$ : Only the existing bank provides a loan, evergreening
- ▶  $\hat{L} > \hat{L}^*$ : No new loan is granted
- ▶ To entice companies taking the evergreening loan, existing banks offer better conditions than other banks would

- 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.
- ▶ If the outstanding loan is of intermediate size, then only existing banks would provide a new loan to the company in order to recover from the failed investment. This is the case of evergreening
- ▶ If the outstanding loan is large, no bank would provide a new loan to the company in order to recover from the failed investment.
- ▶ To entice companies to take up the loan with the existing bank, this bank is able to offer better conditions than a new bank.
- We thus see that banks may extend loans to companies that are unable to repay an existing loan. Existing banks do so in order to recover some of the losses they would otherwise make, while for new banks it is a profitable investment. As existing banks may recover losses, they are less strict when providing new loans and will grant loans for larger outstanding loans.



# Summary

- ▶ If the outstanding loan is not too large, an existing bank will extend a new loan to recover some of the loan amount
- ▶ Banks provide a loan to a company that is not creditworthy to reduce their losses on the outstanding loan
- ▶ This can delay the failure of a company and expose other creditors to additional risks if they are unaware of the impending default

- Evergreening happens when a current banks extends a loan to a company that other banks would not grant a loan to.
  - ▶
    - An existing bank will grant a new loan to a company not being able to repay its outstanding loan, provided this outstanding loan is not too large.
    - Their motivation is to recover some or even all of the outstanding loan.
  - ▶
    - If new banks would not provide a loan, we can interpret that as the company not being creditworthy, but existing banks will nevertheless loans in this case, as long as the outstanding loan amount is not too high.
    - Existing banks provide these loans in the hope of reducing their losses from the outstanding loans that are not going to be repaid.
  - ▶
    - If the new loan does not guarantee that both loans are repaid, the company still fails, although the losses to the existing bank are reduced. Hence the failure of the company is known to the bank, but it is delayed until the new loan also needs to be repaid. The bank therefore knows that a failure is inevitable and it is only delayed until the new loan has enabled the bank to recover some of their losses.
    - 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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