

Chapter 17.1.1
Fixed-price deposit insurance



- Bank runs can have widespread economic consequences, not just due to the losses for individual depositors, but also the consequences of such bank failures for lending and subsequently investments in the economy.
- As bank runs can be individually rational, a mechanism to eliminate this incentive would benefit the economy.
- Such a mechanism could be deposit insurance, which pays the depositor if the bank is not able to do so. This eliminates any losses from retaining deposits in the bank and a bank run should not occur.
- We will investigate what impact such deposit insurance has on the behaviour of banks.

The effect on deposit rates

- ▶ Deposit insurance is often unpriced or any charges are fixed
- ▶ Deposit insurance eliminates the risk to depositors, which would obtain lower deposit rates
- ▶ This will affect the incentives of banks when lending

The effect on deposit rates

- Eliminating the risk of deposits not being repaid, will affect the deposit rate that banks have to pay.
 - ▶
 - In many cases, deposit insurance is provided free through government guarantees to depositors.
 - In other cases, banks contribute through a fixed fee, often determined as a fraction of the deposits insured,
 - ▶
 - The consequence of having deposit insurance is that depositors can be sure to have their deposits repaid, often including interest; thus any risk from the possible failure of the bank is eliminated. This risk of losses can either arise from the risk banks take when providing loans or the possible early withdrawal of deposits.
 - With the risks to depositors eliminated, they would not demand a risk premium and therefore the deposit rate should reduce, increasing profits to banks.
 - ▶ We will see that this change will affect the lending decisions by banks.
- We will not continue to see how banks are affected by deposit insurance and what the consequences are.

Bank profits without deposit insurance

- ▶ Banks obtain the repayment of loans and in turn repay their depositors and equity owners
 - ▶ $\Pi_B = \pi (1 + r_L) L - (1 + r_D) D - E$
 - ▶ In competitive markets, banks make no profits: $\Pi_B = 0$
- $\Rightarrow 1 + r_L = \frac{(1+r_D)D+E}{\pi(D+E)}$

Bank profits without deposit insurance

- We first consider the profits of a bank if no deposit insurance exists.
 - ▶
 - The bank profits are determined by the repayment of the loans they have granted.
 - From this the bank repays its depositors
 - and recovers its own equity which it has invested.
 - ▶ *Formula*
 - ▶ If banks are competitive, then they make no profits.
 - ▶ [⇒] From this condition we can, for a given deposit rate, determine the loan rate the bank charges.
- Having established the loan rate for banks without deposit insurance, we can now continue with assessing the case of a deposit insurance being introduced.

Maximizing risks

- ▶ With deposit insurance, banks have to pay the insurance premium
- ▶ $\hat{\Pi}_B = \pi ((1 + r_L) L - (1 + r_D) D) - P - E$
- ▶ Assume loan rates are set competitively as without deposit insurance
- ⇒ $\hat{\Pi}_B = (1 - \pi) (1 + r_D) D - P$
 $= (1 - \pi) (1 + r_D) \frac{1}{1+\kappa} L - P$
- ▶ Bank profits are maximized if loan risks are maximized and leverage is maximized

-
- ▶ The profits of the bank are given similar to before, however, with deposit insurance, the bank repays the deposits only if it has the resources to do so, thus if the loans are repaid. In addition the bank has to pay an insurance premium.
 - ▶ *Formula*
 - ▶ We now assume that loan rates are set as they were in the case without deposit insurance. This might be due to internally banks calculating profits ignoring deposit insurance, or there might be competition from banks not covered by deposit insurance.
 - ▶ [⇒] We can insert for the loan rate into the profits of the bank.
 - ▶ [] We can rewrite this result using the fraction of equity with which the bank finances its loans.
 - For a given deposit insurance premium, we see that this expression is maximized the higher the risk of the bank is, the lower π is.
 - A smaller κ also increases the profits, thus banks would choose the least amount of equity possible.
- We thus see that the elimination of risk for depositors induces moral hazard in that the bank seeks to increase its risk, through more risky loans and a higher leverage (lower equity). The reason is that the bank will take the benefits of the higher risks, but the costs of loans not being repaid is covered by the deposit insurance and not the bank itself.

Optimal deposit insurance pricing

- ▶ Deposit insurance premia should take into account the risks of banks
 - ▶ Set premium such that $\hat{\Pi}_B = 0$
- $\Rightarrow P = (1 - \pi) (1 + r_D) \frac{1}{1+\kappa} L$
- ▶ The premium is increasing in loan risks and bank leverage
 - ▶ This would provide no incentive to increase risks

- The incentive to increase the risk of their lending activities was based on the assumption of an exogenously fixed deposit insurance premium. We now will see how an appropriately priced deposit insurance scheme can reduce this incentive for banks to increase risks.
- ▶ As with all insurance premia, deposit insurance premia should also take into account the risks the insurance takes. The fixed insurance premium does not take risks into account as it does not respond to the choices the banks makes.
- ▶ Let us set the deposit insurance premium such that, as in competitive markets, banks make no profits.
- ▶ [⇒] Inserting from the above profit function, we easily get the deposit insurance premium.
- ▶
 - We see that the premium is increasing in the risks the bank takes, a lower π increases the premium.
 - Similarly, a higher leverage, a lower κ , will increase the premium. Here the lower amount of equity reduces the buffer for any losses before the deposit insurance has to repay deposits, making higher leverage more risky as banks are more likely to fail.
- ▶ As the premium increases as the risks increase, exactly offsetting their additional profits from this strategy, banks have no incentives to increase risks as there is no benefit for them.
- We thus see that with deposit insurance schemes taking into account the risks a bank takes, it has no incentive to increase risks.

Summary

- ▶ Deposit insurance premia that do not take into account the risks banks take, provide incentives to increase risks
- ▶ Deposit insurance causes moral hazard as any losses to depositors are covered, allowing them to be unresponsive to bank risks
- ▶ Any such incentives to increase risks must be countered by other regulatory measures, such as capital requirements

- Deposit insurance provides incentives for banks to increase risks unless it is priced to take these risks into account.
- ▶ We have seen that deposit insurance that does not take into account the risks banks are taking, gives incentives to banks to take additional risks as any losses are covered by the deposit insurance, but any gains from the more risky strategy are remaining with the bank.
- ▶
 - It is therefore that deposit insurance causes moral hazard. Depositors who would normally increase the required deposit rate in response to higher risks the banks takes, to compensate them for any potential losses.
 - With these losses covered by the deposit insurance, depositors are not concerned about bank risks, and would not require higher deposit rates. Thus banks' costs would not increase when taking higher risks. The alternative is to price the deposit insurance such that the premia reflect the risks taken.
- ▶
 - Without an accordingly priced deposit insurance, the increase in risk can only be prevented if additional regulation is put into place.
 - This might be achieved through capital requirements that prevents the increase of leverage, but also the increase of risks. If the capital requirements are tied to the risks of the loans, then increasing risks for a given amount of capital (equity) is not possible.
- Deposit insurance has the potential to introduce moral hazard into the risk-taking of banks, which would have to be countered by additional regulatory measures to avoid such a scenario.



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

Copyright © by Andreas Krause

Picture credits:

Cover: Bernard Spragg, NZ from Christchurch, New Zealand, CC0, via Wikimedia Commons, [https://commons.wikimedia.org/wiki/File:Bank_of_China_Hong_Kong_\(9532283389\).jpg](https://commons.wikimedia.org/wiki/File:Bank_of_China_Hong_Kong_(9532283389).jpg)

Back: Florian Lindner, CC BY 2.5 <https://creativecommons.org/licenses/by/2.5> via Wikimedia Commons, https://commons.wikimedia.org/wiki/File:Hong_Kong_Panorama_at_night.jpg

Andreas Krause
Department of Economics
University of Bath
Claverton Down
Bath BA2 7AY
United Kingdom

E-mail: mnsak@bath.ac.uk