



Chapter 14.1.1
The breakdown of liquidity insurance

Loan sales to finance deposit withdrawals

Loan sales to finance deposit withdrawals

- ▶ Deposits can be withdrawn **at any time**

Loan sales to finance deposit withdrawals

- ▶ Deposits can be withdrawn at any time, while loans are given for **longer fixed terms**

Loan sales to finance deposit withdrawals

- ▶ Deposits can be withdrawn at any time, while loans are given for longer fixed terms
- ▶ If a bank faces a **withdrawal of deposits**, it might not have the amount of cash reserves to pay these depositors

Loan sales to finance deposit withdrawals

- ▶ Deposits can be withdrawn at any time, while loans are given for longer fixed terms
- ▶ If a bank faces a withdrawal of deposits, it might not have the amount of cash reserves to pay these depositors
- ▶ If not enough cash reserves are held, banks will need to **sell loans** to generate cash reserves

Loan sales to finance deposit withdrawals

- ▶ Deposits can be withdrawn at any time, while loans are given for longer fixed terms
- ▶ If a bank faces a withdrawal of deposits, it might not have the amount of cash reserves to pay these depositors
- ▶ If not enough cash reserves are held, banks will need to sell loans to generate cash reserves
- ▶ Such sales will cause **losses** as loans often cannot be sold at full value

Loan sales to finance deposit withdrawals

- ▶ Deposits can be withdrawn at any time, while loans are given for longer fixed terms
- ▶ If a bank faces a withdrawal of deposits, it might not have the amount of cash reserves to pay these depositors
- ▶ If not enough cash reserves are held, banks will need to sell loans to generate cash reserves
- ▶ Such sales will cause losses as loans often cannot be sold at full value

Return to depositors not withdrawing

Return to depositors not withdrawing

- ▶ Banks **retain some cash** by not lending out all deposits

Return to depositors not withdrawing

- ▶ Banks retain some cash by not lending out all deposits
- ▶ Deposits are withdrawn, representing a fraction of these loans, γL

- ▶ γL

Return to depositors not withdrawing

- ▶ Banks retain some cash by not lending out all deposits
- ▶ Deposits are withdrawn, representing a fraction of these loans, γL
- ▶ Banks can sell loans and obtain a fraction of its face value
- ▶ $\gamma L = \lambda \hat{L}$

Return to depositors not withdrawing

- ▶ Banks retain some cash by not lending out all deposits
- ▶ Deposits are withdrawn, representing a fraction of these loans, γL
- ▶ Banks can **sell loans** and obtain a **fraction of its face value**, which needs to **balance** the deposit withdrawal
- ▶ $\gamma L = \lambda \hat{L}$

Return to depositors not withdrawing

- ▶ Banks retain some cash by not lending out all deposits
- ▶ Deposits are withdrawn, representing a fraction of these loans, γL
- ▶ Banks can sell loans and obtain a fraction of its face value, which needs to balance the deposit withdrawal
- ▶ $\gamma L = \lambda \hat{L}$
- ▶ Assume that $\lambda \geq \gamma$ and the bank can raise sufficient cash to repay all withdrawn deposits

Return to depositors not withdrawing

- ▶ Banks retain some cash by not lending out all deposits
- ▶ Deposits are withdrawn, representing a fraction of these loans, γL
- ▶ Banks can sell loans and obtain a fraction of its face value, which needs to balance the deposit withdrawal
- ▶ $\gamma L = \lambda \hat{L}$
- ▶ Assume that $\lambda \geq \gamma$ and the bank can raise sufficient cash to repay all withdrawn deposits
- ▶ Depositors retaining deposits will receive the **loan repayment**

- ▶ $1 + \hat{r}_D = \pi (1 + r_L)$ ———

Return to depositors not withdrawing

- ▶ Banks retain some cash by not lending out all deposits
- ▶ Deposits are withdrawn, representing a fraction of these loans, γL
- ▶ Banks can sell loans and obtain a fraction of its face value, which needs to balance the deposit withdrawal
- ▶ $\gamma L = \lambda \hat{L}$
- ▶ Assume that $\lambda \geq \gamma$ and the bank can raise sufficient cash to repay all withdrawn deposits
- ▶ Depositors retaining deposits will receive the **loan repayment** on the **outstanding loans**
- ▶ $1 + \hat{r}_D = \pi (1 + r_L) \frac{L - \hat{L}}{L}$

Return to depositors not withdrawing

- ▶ Banks retain some cash by not lending out all deposits
- ▶ Deposits are withdrawn, representing a fraction of these loans, γL
- ▶ Banks can sell loans and obtain a fraction of its face value, which needs to balance the deposit withdrawal
- ▶ $\gamma L = \lambda \hat{L}$
- ▶ Assume that $\lambda \geq \gamma$ and the bank can raise sufficient cash to repay all withdrawn deposits
- ▶ Depositors retaining deposits will receive the **loan repayment** on the **outstanding loans** and share this with all **depositors that have not withdrawn**
- ▶ $1 + \hat{r}_D = \pi (1 + r_L) \frac{L - \hat{L}}{D - \gamma L}$

Return to depositors not withdrawing

- ▶ Banks retain some cash by not lending out all deposits
- ▶ Deposits are withdrawn, representing a fraction of these loans, γL
- ▶ Banks can sell loans and obtain a fraction of its face value, which needs to balance the deposit withdrawal
- ▶ $\gamma L = \lambda \hat{L}$
- ▶ Assume that $\lambda \geq \gamma$ and the bank can raise sufficient cash to repay all withdrawn deposits
- ▶ Depositors retaining deposits will receive the loan repayment on the outstanding loans and share this with all depositors that have not withdrawn
- ▶ $1 + \hat{r}_D = \pi (1 + r_L) \frac{L - \hat{L}}{D - \gamma L}$

Early withdrawal of deposits

Early withdrawal of deposits

- ▶ When withdrawing deposits, we assume no interest is payable, hence $r_D = 0$

Early withdrawal of deposits

- ▶ When withdrawing deposits, we assume no interest is payable, hence $r_D = 0$
- ▶ Depositors would not withdraw if $\hat{r}_D \geq r_D$

Early withdrawal of deposits

- ▶ When withdrawing deposits, we assume no interest is payable, hence $r_D = 0$
 - ▶ Depositors would not withdraw if $\hat{r}_D \geq r_D$
- $\Rightarrow \lambda \geq \frac{\gamma\pi(1+r_L)}{\pi(1+r_L)-(1-\gamma)} > \gamma$

Early withdrawal of deposits

- ▶ When withdrawing deposits, we assume no interest is payable, hence $r_D = 0$
- ▶ Depositors would not withdraw if $\hat{r}_D \geq r_D$
- ⇒ $\lambda \geq \frac{\gamma\pi(1+r_L)}{\pi(1+r_L)-(1-\gamma)} > \gamma$
- ▶ If sales are not causing too much losses, depositors do **not withdraw** early

Early withdrawal of deposits

- ▶ When withdrawing deposits, we assume no interest is payable, hence $r_D = 0$
- ▶ Depositors would not withdraw if $\hat{r}_D \geq r_D$
- ⇒ $\lambda \geq \frac{\gamma\pi(1+r_L)}{\pi(1+r_L)-(1-\gamma)} > \gamma$
- ▶ If sales are not causing too much losses, depositors do not withdraw early

High withdrawal rates

High withdrawal rates

- ▶ If loan sales are not able to generate sufficient cash to repay all early withdrawals,
 $\lambda < \gamma$

High withdrawal rates

- ▶ If loan sales are not able to generate sufficient cash to repay all early withdrawals, $\lambda < \gamma$, those retaining deposits will receive **no repayment**

High withdrawal rates

- ▶ If loan sales are not able to generate sufficient cash to repay all early withdrawals, $\lambda < \gamma$, those retaining deposits will receive no repayment

$$\Rightarrow 1 + \hat{r}_D = 0$$

High withdrawal rates

- ▶ If loan sales are not able to generate sufficient cash to repay all early withdrawals, $\lambda < \gamma$, those retaining deposits will receive no repayment

$$\Rightarrow 1 + \hat{r}_D = 0$$

- ▶ Withdrawing depositors obtain the cash generated after selling all loans

- ▶ $1 + r_D = \frac{D - (1 - \lambda)L}{D} > 0$

High withdrawal rates

- ▶ If loan sales are not able to generate sufficient cash to repay all early withdrawals, $\lambda < \gamma$, those retaining deposits will receive no repayment

$$\Rightarrow 1 + \hat{r}_D = 0$$

- ▶ Withdrawing depositors obtain the cash generated after selling all loans and share this among those withdrawing deposits

- ▶ $1 + r_D = \frac{D - (1 - \lambda)L}{D - (1 - \gamma)L} > 0$

High withdrawal rates

- ▶ If loan sales are not able to generate sufficient cash to repay all early withdrawals, $\lambda < \gamma$, those retaining deposits will receive no repayment

$$\Rightarrow 1 + \hat{r}_D = 0$$

- ▶ Withdrawing depositors obtain the cash generated after selling all loans and share this among those withdrawing deposits

$$\text{▶ } 1 + r_D = \frac{D - (1 - \lambda)L}{D - (1 - \gamma)L} > 0$$

$$\Rightarrow \gamma > \gamma^* = \lambda \frac{\pi(1+r_L) - 1}{\pi(1+r_L) - \lambda}$$

High withdrawal rates

- ▶ If loan sales are not able to generate sufficient cash to repay all early withdrawals, $\lambda < \gamma$, those retaining deposits will receive no repayment
- ⇒ $1 + \hat{r}_D = 0$
- ▶ Withdrawing depositors obtain the cash generated after selling all loans and share this among those withdrawing deposits
- ▶ $1 + r_D = \frac{D - (1 - \lambda)L}{D - (1 - \gamma)L} > 0$
- ⇒ $\gamma > \gamma^* = \lambda \frac{\pi(1 + r_L) - 1}{\pi(1 + r_L) - \lambda}$
- ▶ If sufficient depositors withdraw early, it is optimal for **all depositors** to withdraw early

High withdrawal rates

- ▶ If loan sales are not able to generate sufficient cash to repay all early withdrawals, $\lambda < \gamma$, those retaining deposits will receive no repayment
- ⇒ $1 + \hat{r}_D = 0$
- ▶ Withdrawing depositors obtain the cash generated after selling all loans and share this among those withdrawing deposits
- ▶ $1 + r_D = \frac{D - (1 - \lambda)L}{D - (1 - \gamma)L} > 0$
- ⇒ $\gamma > \gamma^* = \lambda \frac{\pi(1 + r_L) - 1}{\pi(1 + r_L) - \lambda}$
- ▶ If sufficient depositors withdraw early, it is optimal for all depositors to withdraw early

Self-fulfilling prophecies

Self-fulfilling prophecies

- ▶ If depositors believe early withdrawals are sufficiently high, they will also **withdraw early**

Self-fulfilling prophecies

- ▶ If depositors believe early withdrawals are sufficiently high, they will also withdraw early
- ▶ This represents a **bank run**

Self-fulfilling prophecies

- ▶ If depositors believe early withdrawals are sufficiently high, they will also withdraw early
- ▶ This represents a bank run
- ▶ If depositors believe early withdrawals are sufficiently low, they will **not withdraw early**

Self-fulfilling prophecies

- ▶ If depositors believe early withdrawals are sufficiently high, they will also withdraw early
- ▶ This represents a bank run
- ▶ If depositors believe early withdrawals are sufficiently low, they will not withdraw early
- ▶ Their **behaviour aligns with their belief**

Self-fulfilling prophecies

- ▶ If depositors believe early withdrawals are sufficiently high, they will also withdraw early
- ▶ This represents a bank run
- ▶ If depositors believe early withdrawals are sufficiently low, they will not withdraw early
- ▶ Their behaviour aligns with their belief and what they **expect** to occur, **will happen**

Self-fulfilling prophecies

- ▶ If depositors believe early withdrawals are sufficiently high, they will also withdraw early
- ▶ This represents a bank run
- ▶ If depositors believe early withdrawals are sufficiently low, they will not withdraw early
- ▶ Their behaviour aligns with their belief and what they expect to occur, will happen

Summary

Summary

- ▶ Bank runs are based on **expectations** about the behaviour of other depositors

Summary

- ▶ Bank runs are based on expectations about the behaviour of other depositors, **not** information about the bank

Summary

- ▶ Bank runs are based on expectations about the behaviour of other depositors, not information about the bank
- ▶ A **swing in expectations** can cause bank runs

Summary

- ▶ Bank runs are based on expectations about the behaviour of other depositors, not information about the bank
- ▶ A swing in expectations can cause bank runs and it is **optimal to join** the bank run

Summary

- ▶ Bank runs are based on expectations about the behaviour of other depositors, not information about the bank
- ▶ A swing in expectations can cause bank runs and it is optimal to join the bank run
- ▶ If expectations are such that **no bank run** occurs, it is rational to **not withdraw** deposits early

Summary

- ▶ Bank runs are based on expectations about the behaviour of other depositors, not information about the bank
- ▶ A swing in expectations can cause bank runs and it is optimal to join the bank run
- ▶ If expectations are such that no bank run occurs, it is rational to not withdraw deposits early



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