FHLB as Lender of *First* Resort: The Good, the Bad and the Ugly

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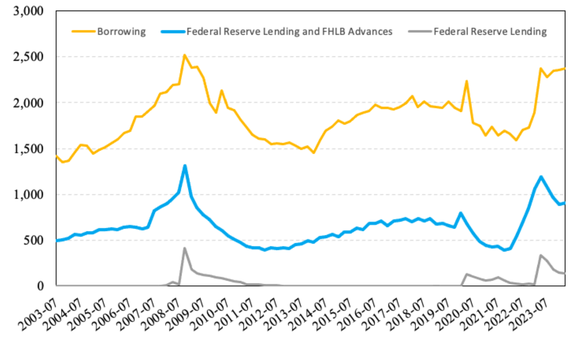
Yudong's Website

Podcast: FHLB Paper

Two Parallel Peaks in FHLB Advances

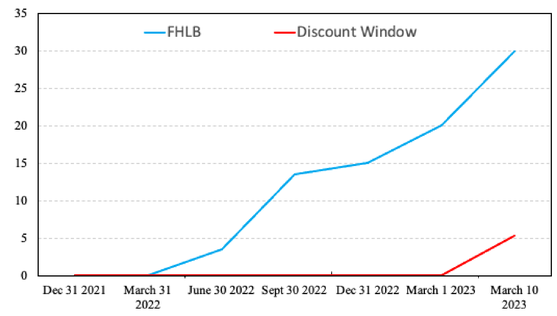
Breakdown of US Commercial Bank Borrowings: FHLB Advances, FED Lending, and Other Borrowing (Q1 2003–Q2 2024, in Billions USD)



Sources: Board of Governors, Financial Accounts of the United States, BOGZ1FL403069330Q , H.4.1 and H.8.

SVB turned to the discount window only on the eve of its failure.

Silicon Valley Bank's Total Outstanding FHLBank Advances and Discount Window (billions of USD)



Sources: Call Report - FFIEC, and Fed.

Why Federal Home Loan Banks (FHLBs)?

Parallel peaks in 2008 and 2023:FHLB advances hit $1 trillion.

- Among 22 run banks with significant liquidity outflows (Mar 9 to 14, 2023), only Silicon Valley Bank and Signature Bank failed.
- All 22 run banks used FHLBs' funding, but only some tapped the Fed's discount window.
- Banks prioritized FHLB borrowing over the Fed's discount window.

Conclusion

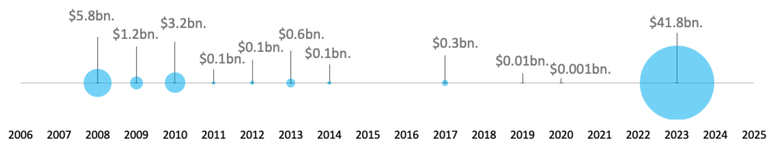
Federal Home Loan Banks' (FHLBs') role in banking crises hinges on borrower bank fundamentals.

1. **The Good:** For banks with sound fundamentals,FHLB advances provide essential liquidity, effectively serving as a lender of both *first* resort and *last* resort.
2. **The Bad:** For banks with intermediate fundamentals, it would be socially optimal for the bank to borrow from the discount window, but FHLB lending postpones failure, benefiting bank managers and FHLBs at the expense of the DIF (Deposit Insurance Fund) and uninsured depositors.
3. **The Ugly:** For banks with unsound fundamentals, it would be socially optimal for the bank to fail immediately, but FHLB lending postpones failure, benefiting bank managers and FHLBs at the expense of the DIF and uninsured depositors.

FHLB Advances to Banks that Failed from 2006 through 2023

FDIC Payment to FHLB for Banks that Failed from 2006 through December 31, 2023

(Principal, Interest, and Prepayment Fee)



Source: FDIC.

Model Setup and Assumptions

Active uninsured depositors (mass A): At time $t = 1$ each active depositor i chooses an attempted withdrawal indicator $W_i^a \in \{0, 1\}$ in a simultaneous-move game.

Total withdrawals at time $t = 1$ by actives are $W^A = \int_{i=0}^{A} W_i^a \, di$.

Transient depositors (mass T): Always withdraw at time $t = 1$.

Government insured depositors (mass G): Never withdraw at time $t = 1$.

Inactive uninsured depositors (mass I) : Never withdraw at time $t = 1$.

At $t = 1$, the total mass of deposits is $D = A + T + G + I$.

The total mass of attempted withdrawals is $W = W^A + T = \int_{i=0}^{A} W_i^a di + T$.

If the bank still exists at $t = 2$, all remaining depositors try to withdraw: $D - W$

The bank's portfolio comprises liquid assets and illiquid assets.

Liquid assets: mark-to-market value $a_L > 0$, which can be liquidated at either $t = 1$ or $t = 2$.

Illiquid assets: If the bank fails at $t = 2$, its illiquid assets pay zero if there is no external funding or if the bank borrows from the FHLB. By contrast, failure after discount-window borrowing raises the liquidation value to Δ>0, where $\Delta \geq D + r\,(W - a_L)^+ - a_L$

Good or bad; Lender of *First* or *Last* Resort?

$T < a_L$: enough liquid assets to pay transient depositors.

$a_L < T + A$: Insufficient liquid assets to pay transient and active depositors.

$T + A - a_L \leq a_I$: enough collateral.

$a_I + a_L \geq D$: fundamentally sound.

Assumptions	Parameter Restrictions	Equilibrium Outcomes
1. No External Lenders	$D \leq a_I + a_L$	Two equilibria: (i) Run equilibrium (bank fails at $t = 1$); (ii) No-run equilibrium (bank survives).
2.a. FHLB Funding	$D \leq a_I + a_L < D + r(T + A - a_L)$	Two equilibria: (i) Run equilibrium (bank fails at $t = 2$); (ii) No-run equilibrium (bank survives).
2.b. FHLB Funding	$a_I + a_L \geq D + r(T + A - a_L)$	Unique no-run equilibrium (bank survives).
3.a. Discount Window Funding	$D \leq a_I + a_L < D + r(T + A - a_L)$	Unique no-run equilibrium (bank survives).
3.b. Discount Window Funding	$a_I + a_L \geq D + r(T + A - a_L)$	Unique no-run equilibrium (bank survives).

Ugly: Collusive Rip-Off

$T < a_L$: enough liquid assets to pay transient depositors.

$a_L < T + A$: Insufficient liquid assets to pay transient and active depositors.

$T + A - a_L \leq a_I$: enough collateral.

$a_I + a_L < D$: fundamentally unsound.

Assumptions	Equilibrium Outcomes
1. No External Lenders	Unique equilibrium: Run; bank fails at $t = 1$
2. FHLB Funding Available	Unique equilibrium: Run; bank fails at $t = 2$
3. Discount Window Funding	Unique equilibrium: Run; bank fails at $t = 1$

$V_{bank} = (1 - f_1)\left(a_L + a_I - D - r\,(T + A - a_L)^+\right)^+ \leftarrow$ a proxy value under assumption 1 and 2

(1) and (3): $V_i = \frac{(a_L - G)^+}{D - G}$; (2): $V_i = 0$

(1) and (3): $V_{DIF} = -\,(G - a_L)^+$; (2): $V_{DIF} = -G$

(1) and (3): $V_{FHLB} = 0$; (2): $V_{FHLB} = \min\left\{r\,(T + A - a_L)^+, (a_I - (T + A - a_L))^+\right\}$