Research Paper Session 2: Deposit Stability

Discussant: Matthew Plosser
Federal Reserve Bank of New York

Community Banking Research Conference
October 2, 2024

Deposit Stability

Dimensions of deposit stability:

1. Price:
   - Quasi-fixed rate – sensitivity to rates somewhere between 0 and 1
   - Sensitivity to short-rates typically referred to as **'deposit beta'**
2. Quantity:
   - Stock of deposits reflect a source of funding
   - Jointly determined with prices (classic trade-off $\Rightarrow$ Price $\uparrow$ leads to Quantity $\uparrow$)
3. Risk sensitivity:
   - Sensitivity (price/quantity/speed) of depositors to bank health
   - Distinct from depositors sensitivity to prevailing rates
   - Heavily influenced by perceived **insurance**

Why do we care?

- Demand deposits are the largest source of funding for the banking industry ($> 50\%$)
- Instability in deposits threatens the solvency of the bank

1. Price-Quantity
   - Determined by depositor opportunity costs (i.e., prevailing short rates)
   - Paying higher prices to retain deposits lowers profits
   - A shrinking stock of deposits may require replacing deposits at higher rates
2. Risk sensitivity
   - Uninsured deposit flight/run risk is sensitive to bank specific health
   - If depositors flee, bank must either (i) replace funds at market rates, (ii) raise equity, or (iii) sell illiquid assets
   - Impaired assets may mean (i) and (ii) are impossible and (iii) insufficient

A framework for considering impact of deposit stability

- Standard accounting/regulatory capital measures are slow to recognize the impact of deposit stability (book/par values)
- Alternative concept – Economic Value of Equity (EVE)

$$EVE = PV_{Assets} - PV_{Liabilities}$$

- Market/fair/present value of assets *and* liabilities
- Reflects the discounted profitability over a long horizon at prevailing rates
- Key to interest rate risk management but also informative as to the role deposit franchise on economic capital / solvency

Deposit stability and bank solvency

Simple bank: \$1 in assets, debts 100% deposits, deposits never mature, no other liabilities:

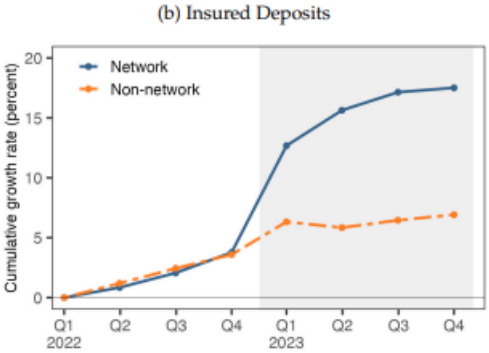
$$PV_{Liabilities} = \frac{\beta * r}{r}$$
$$EVE = PV_{Assets} - \beta$$

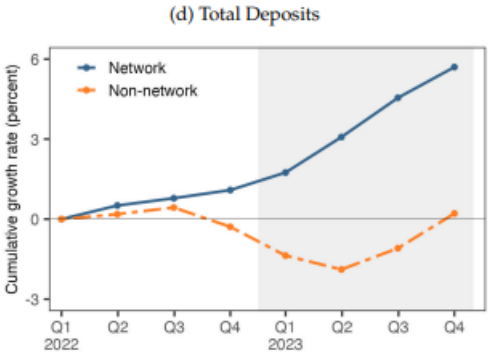
- Low EVE suggests low profitability and potential insolvency
- When deposits pay below market rates ($\beta < 1$) $\rightarrow$ $PV_L \downarrow$ & $\uparrow$ EVE
- Higher prices or replacement funding $\rightarrow$ $\beta \uparrow$ $PV_L \uparrow$ & $\downarrow$ EVE
- Selling assets $\rightarrow$ $PV_A \downarrow$ & $\downarrow$ EVE

Variable Deposit Betas and Bank Interest Rate Risk Exposure

	Dependent variable: Deposit beta			
	(1)	(2)	(3)	(4)
Ln(Fed funds rate$_{t-1}$)	0.051***			
	(0.007)			
Fed funds rate$_{t-1}$		0.314***		
		(0.014)		
(Fed funds rate$_{t-1}$)^2		-0.048***		
		(0.002)		
Ln(2-year yield$_{t-1}$)			0.032***	
			(0.012)	
2-year yield$_{t-1}$				0.230***
				(0.018)
(2-year yield$_{t-1}$)^2				-0.036***
				(0.003)
Time deposits$_{t-1}$/Total deposits$_{t-1}$	1.168***	1.076***	1.288***	1.206***
	(0.124)	(0.125)	(0.121)	(0.120)
Controls	Yes	Yes	Yes	Yes
Bank FEs	Yes	Yes	Yes	Yes
Observations	37,378	37,378	37,378	37,378
R-squared	0.03	0.04	0.03	0.03

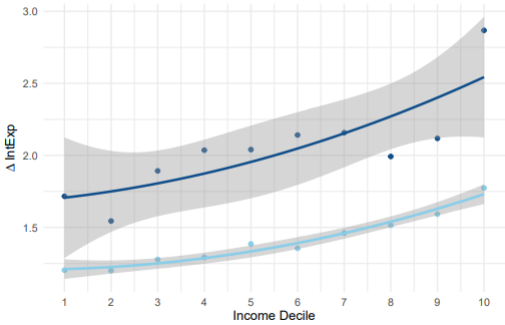
The Economics of Market-Based Deposit Insurance



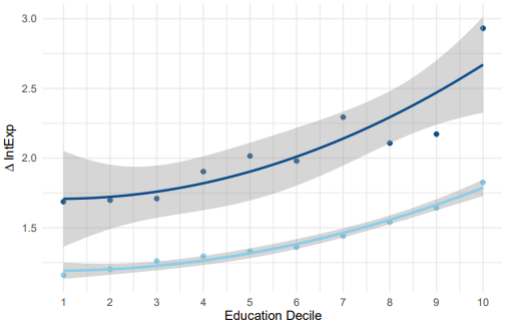


Depositor Characteristics and Deposit Stability

Panel A: Income



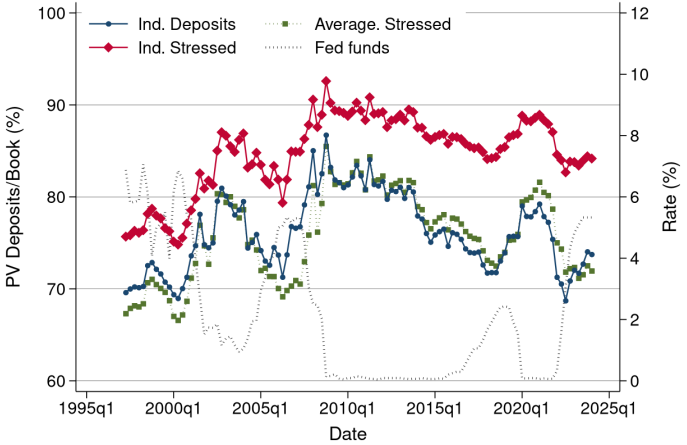
Panel B: Education



Putting it together

1. Variable Deposit Betas
   - Movement in deposit betas over time (convexity) changes sensitivity of profits to interest rates (IRR)
   - Time-series variation is critical to accurately assessing bank risk
   - How to forecast future betas rather than current?
2. Deposit Insurance
   - Insurance is associated with the risk sensitivity of depositors
   - Reciprocal deposit programs may provide an alternative to deposit flight for risk sensitive depositors
   - But who bears the program costs? Banks? Depositors?
3. Depositor Characteristics
   - Depositor behavior is highly related to depositor characteristics
   - Some retail depositors are more price and risk sensitive than others
   - Patterns vary with bank size! Why?

Present value of deposits over time



Stressed Deposits assume uninsured depositors have a beta of one. Based on calculations from *A Measure of Bank Solvency: Integrating Capital, Liquidity, and Stress*, Beverly Hirtle and Matthew Plosser, 2024

Wrapping

- Conceptually, stakeholders have long known that the stability of deposits are critical to bank fragility
- Novel measures can help identify these banks — but are highly sensitive to key parameters that determine price elasticity (beta) and risk sensitivity of depositors
  - Long period of low rates have led to a neglected risk: data and modeling of deposits have stagnated
    - Significantly more insight and data collection around assets
  - Current supervisory calculations (i.e., FOCUS report) do not capture the richness of depositor behavior
- Panel reveals where we can make substantial progress on modeling depositor behavior, deposit risks, and ultimately bank fragility