

Dynamic Banking and the Value of Deposits

A Brief Summary

Link to the full paper: https://yeli-macrofinance.com/dynamic_bank.pdf

Research on deposits typically focuses on deposit outflows as bank runs have been at the center of banking literature. In this paper, we show that payment inflows often pose a great challenge for banks.

We develop a continuous-time model of a bank's dynamic balance-sheet management. The stock of deposits, which is the key state variable, loads on both positive and negative shocks as depositors receive and send payments. A sequence of positive shocks resembles what U.S. banks experienced during the Covid-19 pandemic: from Q4 2019 to Q1 2020, JP Morgan Chase had an increase of 18% of its deposit liabilities, and the deposits at Citigroup and Bank of America increased by 11% and 10%, respectively. During this period, bankers consistently complained about deposit influx and some even went out of their way to persuade depositors to move money out of their accounts. This is inconsistent with the conventional wisdom that deposit inflow is beneficial (i.e., the marginal value of deposits from bank owners' perspective, or the "*deposit marginal q*", should always be positive). Moreover, banks did not increase lending following the deposit influx.

The key to understanding these phenomena is the combination of bank leverage regulation and equity issuance cost. Deposit influx forces a bank to increase leverage, and if the bank violates the regulatory cap on leverage, it must incur issuance costs to raise equity. Therefore, deposit inflows, by pushing the bank close to the regulatory boundary of equity raising, can decrease bank shareholders' value. Moreover, as the likelihood of costly equity raising increases following deposit inflows, the bank becomes increasingly cautious in risk-taking as negative shocks to earnings would deplete equity and further increase leverage. Therefore, in response to deposit influx, the bank may even cut lending. Since the bank cannot perfectly control the liability side of its balance sheet due to payment-driven deposit flows, it chooses to de-risk the asset side.

We introduce a zero lower bound on deposit rate and show that a low-interest rate environment is detrimental to banks. The bank adjusts deposit flows via deposit rate. Once the deposit rate hits zero, the bank loses its ability to counteract deposit inflows through reductions of the deposit rate. In our model, the bank earns a spread between the market rate, r , and deposit rate. When it is well capitalized (away from the boundary of costly equity raising), the bank raises the deposit rate to attract deposits as a cheap source of funds, and importantly, to gain slack so that when it becomes undercapitalized in the future, there would be more room to cut the deposit rate and deleverage before hitting the zero lower bound. Therefore, when r is high, the bank has more flexibility in raising deposit rate when it is well capitalized without squeezing too much the spread between r and deposit rate. The distance between r and zero essentially determines the degree of flexibility to control deposit flows. A low r makes it more difficult for the bank to manage deposits.

The way we model deposits allows us to sharply distinguish between deposits and a bank's short-term debts. With short-term debts, the bank can always choose to stop borrowing at maturity, and therefore, does not face the problem of unwanted leverage. In contrast, deposits are in effect long-term contracts without a well-defined maturity (Drechsler, Savov, and Schnabl, 2021; Jermann and Xiang, 2023). Deposits leave the bank only when depositors withdraw funds. We show that when the bank is well capitalized, it issues short-term debts to obtain additional financing for lending. Following negative

shocks to bank earnings, the bank deleverages by first reducing its short-term debts. When the bank becomes severely undercapitalized and approaches the boundary of costly equity issuance, it switches from issuing short-term bonds to holding risk-free bonds issued by other entities (e.g., the government), thereby de-risking the asset side of its balance sheet, given that the risk on the liability side (deposits) cannot be fully controlled.

Deposit contracts allow depositors to freely put money in and take money out of their accounts, which is necessary for the seamless operation of the payment system. The consequence is that banks cannot perfectly control their deposit liabilities. The bank's inability to fully control the size of its liabilities gives rise to a balance-sheet management problem that is conceptually very different from that of non-depository intermediaries and nonfinancial firms.

References

- Drechsler, I., A. Savov, and P. Schnabl (2021). Banking on deposits: Maturity transformation without interest rate risk. *The Journal of Finance* 76(3), 1091–1143.
- Jermann, U. and H. Xiang (2023). Dynamic banking with non-maturing deposits. *The Journal of Economic Theory* 209, 105644.