

MONETARY POLICY IMPLEMENTATION

Class Notes

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LIQUIDITY MANAGEMENT

Liquidity management is recognized as one of the fundamental problems in banking in practice. To clarify the ideas, consider the balance sheet of a bank depicted in the left panel of Figure 1. A bank in the real world holds central bank reserves and loans as part of their assets and demand deposits and equity as liabilities. When a bank provides a loan to a potential borrower, that bank is effectively granting credit in the form of checks, electronic checks or electronic credit lines.¹ Credit is a fantastic innovation of modern economies. Credit enables borrowers to perform transactions with minimal transaction costs. When a bank grants credit, this allows the flow of commodities with ease because trading parties don't have to worry about the creditworthiness of each other. As long as a party is confident that his bank will accept the funds transferred by the borrower, the transaction takes place. This aspect of credit creation is essential for the fluent operation of the economy. However, when a bank provides a loan against a credit line, the credit line is also a liability for the bank and a potential source of risk. After the borrower executes a payment, whoever receives payments from that credit line, holds the liabilities of the lender bank. In turn, the holder can make further payments and so on, so the lending bank's credit flows from one hand to another. The bank does not really care who holds the liability. What matters for the bank is that when it provides a loan, it is simultaneously creating a liability that may be potentially transferred. Of course, for every one dollar that a bank provides as credit it earns an interest on that loan which seems as a great deal for the bank. Banks take on a liability by issuing their own liabilities –credit lines- but charge an interest rate for that operation. This deal increases the bank's equity simply by issuing a liability at a lower interest rate than what it will earn from the loan.

The right panel of Figure 1 shows the balance sheet of a bank after a loan is made. The accounts in the figure show how loan creation is profitable. This balance sheet shows that when a loan is created, a liability is created by the bank, but the bank increases its equity because it earns an interest rate. The increment in assets is more than one for one the increment in liabilities.

¹ In practice, banks can also raise deposits from other banks but they can't do this for the whole system.

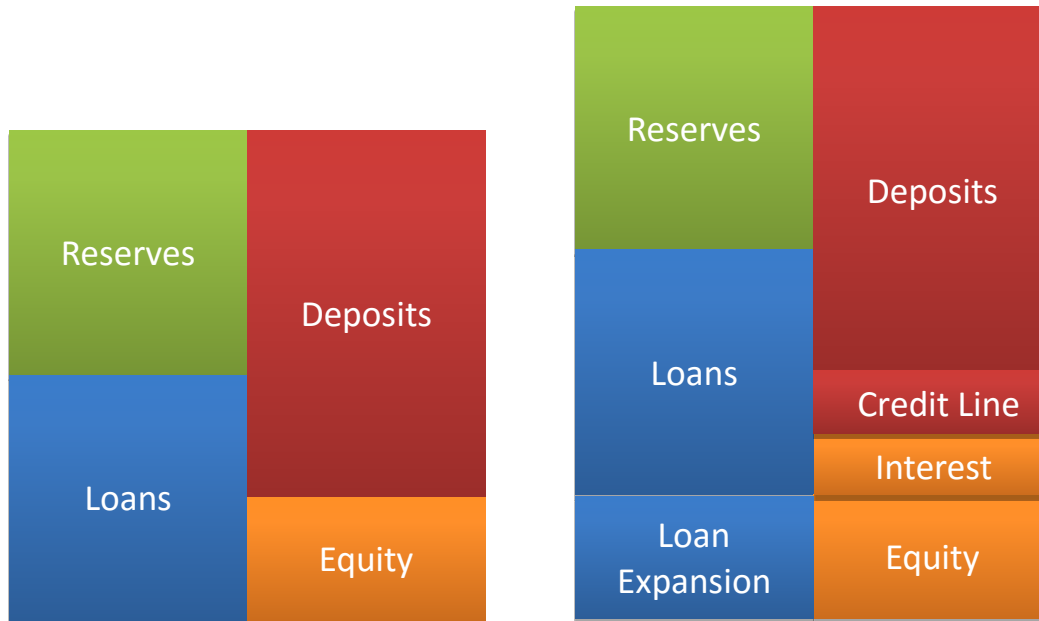


Figure 1: Balance Sheet Expansion

Liquidity Risk: A critical feature that makes banking special is that deposits can be withdrawn from banks immediately. Often, large withdrawals occur before loans mature. An important detail is that when a large withdrawal occurs, deposits are transferred from one bank to another. The bank that receives those deposits is literally taking over the liabilities issued originally by another bank. Thus, by allowing this, banks are unique institutions. They are the only institutions whose liabilities may suddenly become the liabilities of other institutions. This is a great system because it allows credit to flow with ease. This allows borrowers to execute transactions without worrying about where the money came from, or what bank granted the initial credit line. The depositor only worries about the shape of his own bank ---or whether he is FDIC insured. This allows deposits to be a medium of exchange. Nobody needs to bother gathering information about the credit worthiness. This is the reason why deposits are part of the monetary aggregates.

However, since banks take on the liabilities of other banks when deposits are transferred to them, they also request the other bank an assets to settle the transaction. The first bank could, in theory, transfer loans or issue loans against other banks but usually this takes some time.² For the most part, banks rely on reserves issued by the Central Bank to settle transactions among them. This

² The issuer bank may be a specialist on a particular sector, there may be private information or moral-hazard concerns. Transferring loan may be costly due to transaction costs or the bank may fear losing the client. Another possibility is securitization, but often this requires complicated structuring to align the incentives of the seller bank.

settlements system is called the payments system and has an old historical tradition in the United States which predates the existence of the Federal Reserve.

Banks do not necessarily hold reserves to settle withdrawals under all possible contingencies. On the contrary, they are frequently short of reserves. When reserves are insufficient to settle transactions across banks, banks borrow reserves from other banks or from the Central Bank (the FED in the case of the US). The fact that a bank may be short of reserves and must incur in costly borrowing constitutes a potential illiquidity risk. Figure 2 describes this possibility. Suppose there is a withdrawal that exceeds the level of currency reserves at the bank. Banks must rely on costly overnight borrowing to compensate this withdrawal. These costs induce a reduction in bank equity, and an overall shrinkage of the bank's balance sheet.

Compare equity before the loan expansion in the left panel of Figure 3 with the equity in the right of Figure 3. The equity at the right is smaller. This shortfall in equity results from the losses that occur if the bank suffers a large withdrawal after the bank expanded its loans. If withdrawals scale with the size of the bank's deposits, the higher the amount of lending, the higher the deposits and the higher the liquidity risk. To see this, notice that the relative size of reserves to deposits, the bank's ratio of reserves to deposits falls with the amount of lending (see Figure 1 once again). With fewer reserves, the bank is forced to use more borrowing to finance the shortage liquidity and this may be very expensive.

Liquidity risk affects the bank's decisions to lend because it exposes the bank to more risk. Banks can foresee the possibility of liquidity risk and thus, take into account how lending reduces their liquidity ratio and how this increases the risk of incurring in additional costs. If the cost of running short of reserves is low, they will lend more. If the cost is high, they lend less. This tradeoff should be clear by comparing the size of equity in the left and right of Figure 3.

Naturally, if banks become more cautious for any reason, this has effects on the supply of credit. Credit bears real effects because it may induce effects in economic activity by decreasing the availability of mediums of exchange in the economy. Monetary policy has –most of the time- the power to affect this trade off. The next section of these notes explain how.

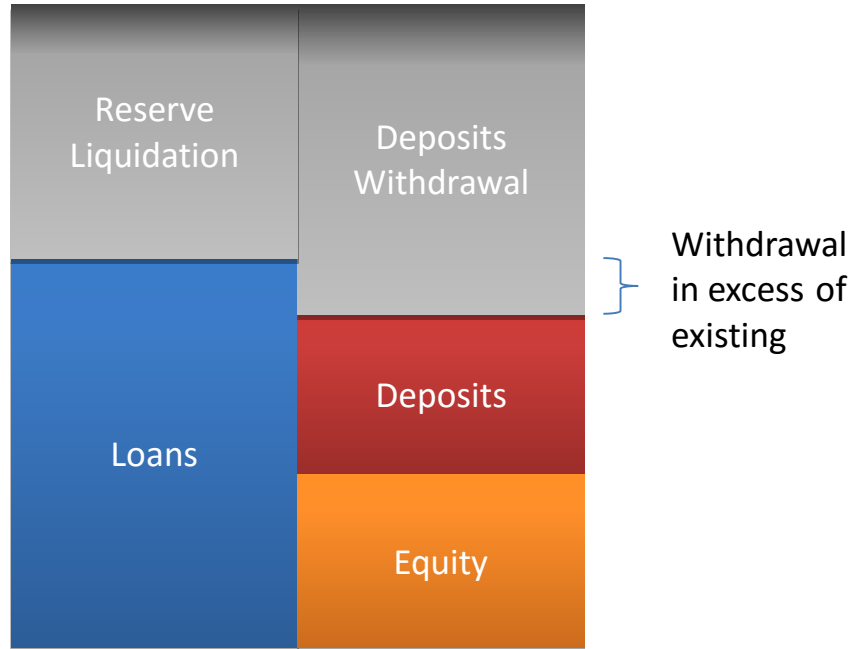


Figure 2: Balance Sheet Liquidity Shock

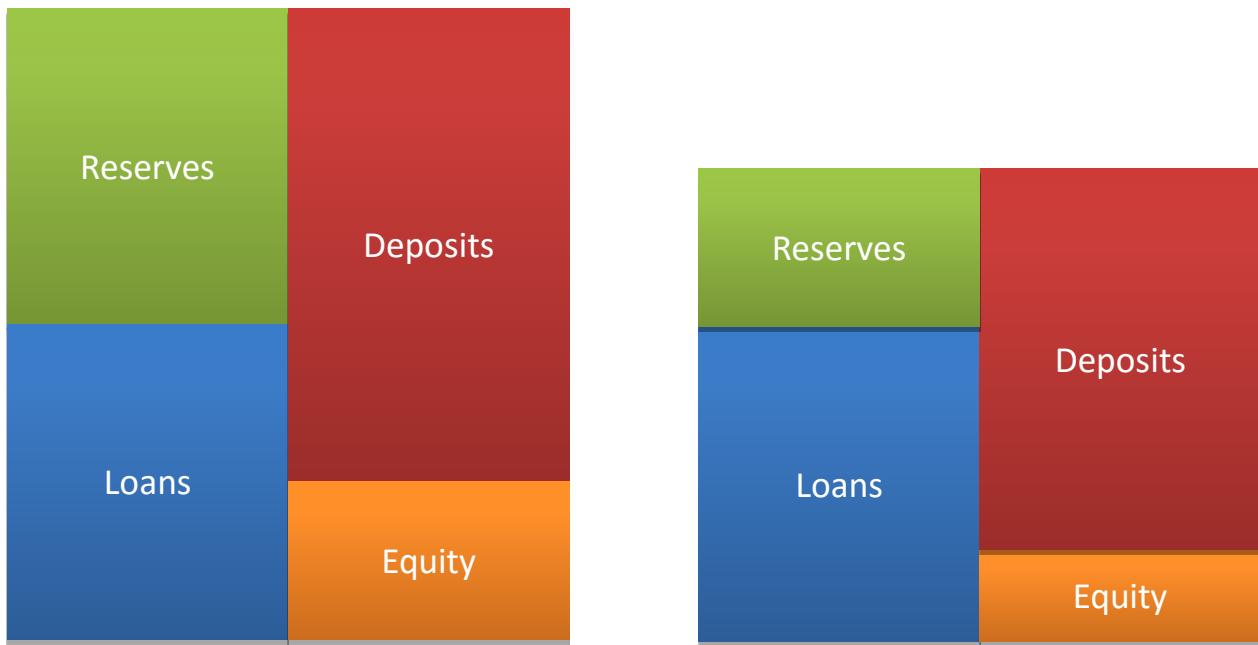


Figure 3: Liquidity Loss

Policy Instruments: In practice, there is a plethora of monetary policy instruments that central banks used to alter the liquidity management trade-off described above. However, most central banks rely only on three: conventional open-market operations, discount window lending, and reserve requirements. These three monetary policy tools affect the liquidity management trade-off in different ways, but they all carry the same effect.

Open market operations are large purchase of loans that substitute loans for reserves. In practice, these purchases are transactions on Treasury Bonds (T-Bills) which can be seen as liquid loans. In our framework, the exchange of liquid assets for illiquid assets will cause a reduction in the liquidity risk faced by those institutions participating in the bond sale. Since at least part of the banking system will have more reserves, some institution will be inclined to do more lending after an open market operation.

The discount window operates differently. The discount window is the rate at which central banks lend reserves to banks at an overnight basis. Thus, lowering this rate affects the financial losses incurred after a withdrawal because banks that lack the reserves will be able to borrow at a lower rate. A reduction in the discount window thus stimulates lending because banks are more inclined to lend more if by doing so they risk lower financial losses. Finally, reserve requirements operate by determining the level of currency after which banks have to start borrowing reserves.

Current Policy Issues

The conduct of monetary policy around the world is changing. The past five years have witnessed banking systems bearing unprecedented losses together with frozen interbank markets. Banks cut back on their lending as these events threatened their survival. In an attempt to preserve financial stability and reinvigorate lending, the central banks of the US and Europe have reduced policy rates to almost zero, and continuously purchased private loans issued from banks. In reaction to these unprecedented policy interventions, banks seem to have mostly accumulated central bank reserves without renewing lending as intended by policy. Why and what can central banks do about this remains an open question.

Not surprisingly, the role of banks in the transmission of monetary policy has been at the centerpiece of policy debates. Unfortunately, there are only a few modern macroeconomic models that take into account that, as occurs in practice, monetary policies are implemented through the banking sector. Instead, most modern macroeconomic models assume that Central Banks have a handle of the economy simply by setting their policy interest rates. Although this seemed a reasonable simplifying assumption prior to the Great Recession, those models are of little use for current policy debates.

Policy Questions

The proposed research agenda has important policy implications and will be of direct interest to central banks and financial regulators around the world. The core model of this agenda seeks to provide answers to a number of theoretical issues that include: How does the transmission of monetary policy depend on the decisions of commercial banks? What type of new economic conditions may induce banks to hold more reserves or lend out less loans? How is the strength of monetary be affected by these shocks? What is the connection between monetary policy and the new financial regulation? Will the FED's policies have consequences fiscal consequences?

PROPOSAL APPENDICES

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