

Lecture Notes on

**MONEY, BANKING,
AND FINANCIAL MARKETS**

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Chapter 9: Banking and the Management of Financial Institutions

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In our overview of the financial system, we briefly considered the role that banks play in channelling funds from agents who have saved funds and want to lend to agents who need funds and want to borrow. We also identified the main sources and uses of funds that banks have.

Mishkin's Chapter 9 begins by taking a much closer look at the typical bank's balance sheet, first listing its sources of funds, or liabilities, and then listing its uses of funds, or assets.

Then, the chapter illustrates in more detail how banks operate: how they obtain their funds from agents who want to lend and channel those funds to agents who want to borrow. In the process of doing this, the chapter introduces us to a valuable analytic device called a T-account. T-accounts will prove useful, not only in this part of the course on banking, but also in the next part of the course that looks at the money supply process.

Finally, the chapter helps us identify and understand four basic principles of bank management: liquidity management, asset management, liability management, and capital adequacy management.

1 The Bank Balance Sheet

A bank's balance sheet lists:

Source of funds, or liabilities.

Uses of funds, or assets.

Bank Capital is defined as

$$\text{Capital} = \text{Assets} - \text{Liabilities},$$

which implies that capital serves as a measure of net worth.

Since we can rearrange this definition to read

$$\text{Assets} = \text{Liabilities} + \text{Capital},$$

it also implies that if we put assets on one side of the bank's balance sheet, and liabilities plus capital on the other, then the two sides of the balance sheet will always balance.

Looking at the bank's balance sheet shows us that banks make profits by charging an interest rate on their assets that exceeds the interest rate that they pay on their liabilities.

Mishkin's Table 1 (p.202) shows the combined balance sheet of all commercial banks as of January 2003, with all items listed as a percentage of total assets or liabilities.

Liabilities (Sources of Funds)

Checkable Deposits	9%
<i>Nontransaction Deposits:</i>	
Small-denomination Time Deposits and Savings Deposits	42%
Large-denomination Time Deposits	14%
Borrowings	28%
Bank Capital	7%
Total	100%

Assets (Uses of Funds)

Reserves, Cash Items in the Process of Collection, and Deposits at Other Banks	5%
<i>Securities:</i>	
US Government and Agency	15%
State and Local Government	10%
<i>Loans:</i>	
Commercial and Industrial	14%
Real Estate	29%
Consumer	9%
Interbank	4%
Other	8%
Physical Assets	6%
Total	100%

1.1 Liabilities (Sources of Funds)

Checkable Deposits:

Checkable deposits are deposits in bank accounts that allow their owners to write checks.

Checkable deposits include:

Demand deposits = checking accounts that pay no interest.

Negotiable Order of Withdrawal (NOW) accounts = checking accounts that pay interest.

Money Market Deposit Accounts (MMDAs) = high-yielding deposit accounts that allow limited check-writing privileges.

Unlike demand deposits and NOW accounts, MMDAs are not included in M1 and are not subject to reserve requirements.

Checkable deposits are payable on demand: if the depositor requests a withdrawal or writes a check, the bank must pay immediately.

Checkable deposits are a bank's lowest-cost source of funds, since depositors are willing to accept a lower interest rate in exchange for the convenience of being able to write checks.

But checkable deposits are also costly to maintain: the bank must process the checks, prepare monthly statements, maintain bank branches, etc.

Nontransaction Deposits:

Owners cannot write checks on nontransaction deposits.

But they pay higher interest rates than checkable deposits.

Nontransaction deposits include:

Savings deposits = funds can be withdrawn, without penalty, at any time.

Small (under \$100,000) time deposits (certificates of deposit or CDs) = have a fixed maturity, with penalty for early withdrawal.

Large (over \$100,000) time deposits (CDs) = also have a fixed maturity date, but they are negotiable, meaning that they can be resold in a secondary market.

Borrowings:

Borrowings include:

Borrowings from the Federal Reserve = discount loans.

Borrowings from other banks = federal funds.

Borrowings from non-bank corporations = repurchase agreements.

Bank Capital:

As noted above:

$$\text{Capital} = \text{Assets} - \text{Liabilities} = \text{Net Worth.}$$

And as we'll see below, bank capital is a cushion against a drop in the value of the bank's assets, since the bank becomes insolvent (bankrupt) if the value of its assets falls below the value of its liabilities (i.e., it owes more than it can repay).

1.2 Assets (Uses of Funds)

Reserves:

Reserves include:

The bank's deposits at the Federal Reserve.

Vault cash = currency that is physically held by the bank.

Reserves do not pay interest.

Required reserves:

By law, the bank must hold a certain fraction (10%) of every dollar of checkable deposits (more precisely, demand deposits and NOW accounts) it receives as reserves.

10% = required reserve ratio.

Excess reserves = additional reserves held by the bank to meet its customers' requests for withdrawals.

Cash Items in the Process of Collection:

A check that had been deposited at the bank, but not yet collected from the check writer's bank, is a cash item in the process of collection.

Deposits at Other Banks:

Many small banks hold deposits at larger banks.

In return, the large banks provide services such as check collection and help with securities purchases.

This relationship between large and small banks is called correspondent banking, and is less important today than in was years ago, when check collection and securities transactions were considerably more difficult.

Securities:

Securities include:

US government and US government agency securities.

State and local government (municipal) securities.

By law, banks can only hold debt instruments; they cannot own equities.

Because they are default-free and highly liquid, a bank's holdings of short-term US government securities (Treasury bills) are sometimes call its "secondary reserves."

Loans:

Loans include:

Commercial and industrial loans.

Real estate loans (mortgages).

Consumer loans.

Interbank loans.

Other Assets:

Physical assets owned by banks: buildings and land, computers and office equipment, etc.

2 Basic Operation of a Bank: T-accounts

By looking at their balance sheets, we can see that banks sell liabilities with one set of characteristics and use the proceeds to acquire assets with a different set of characteristics.

For example, a bank will accept a savings deposit from one customer and use the proceeds to make a mortgage loan to another customer.

This process is called asset transformation.

By engaging in asset transformation, the bank hopes to profit by charging a higher interest rate on its assets than it must pay on its liabilities.

Bank operations can be illustrated with the help of a diagram called a T-account. A T-account is set up in the same format as a balance sheet, with assets on one side and liabilities on the other. But the T-account is simplified since it only shows the changes on each side that occur as a result of specific bank operations.

To see how banks engage in asset transformation, let's consider three examples.

2.1 Example 1

Suppose a customer deposits a \$100 bill into his or her checking account at Fleet Bank.

The bank puts the \$100 bill in its vault and adds \$100 to the customer's checking account balance.

The \$100 deposit shows up as a new liability on Fleet's balance sheet, while the extra \$100 in vault cash adds to Fleet's reserves and therefore shows up as a new asset.

Hence, the T-account looks like this:

FLEET

Assets	Liabilities
Reserves +\$100	Checkable Deposits +\$100

Thus, when a bank receives additional deposits, it gains an equal amount of reserves.

2.2 Example 2

Now suppose that instead of depositing a \$100 bill, Fleet's customer deposits a check for \$100 written on an account at Citibank.

The initial effect of this transaction can be shown in a T-account for Fleet:

FLEET

Assets	Liabilities
Cash Items in the Process of Collection +\$100	Checkable Deposits +\$100

Fleet then deposits the check in its account at the Fed.

The Fed transfers \$100 from Citibank's account to Fleet's account.

Now we can draw T-accounts for both Fleet and Citibank:

FLEET

Assets	Liabilities
Reserves +\$100	Checkable Deposits +\$100

CITIBANK

Assets	Liabilities
Reserves -\$100	Checkable Deposits -\$100

Thus, when a bank receives additional deposits, it gains an equal amount of reserves.

And when a bank loses deposits, it loses an equal amount of reserves.

2.3 Example 3

Consider Fleet Bank's situation after it receives \$100 in checkable deposits and hence \$100 in additional reserves.

By law, Fleet must hold 10%, or \$10, as required reserves.

The remaining \$90 is excess reserves.

FLEET

Assets	Liabilities
Required Reserves +\$10	Checkable Deposits +\$100
Excess Reserves +\$90	

Since reserves pay no interest, and since Fleet is not required to hold excess reserves, it may decide to use the \$90 to make a new loan to one of its other customers.

FLEET

Assets	Liabilities
Required Reserves +\$10	Checkable Deposits +\$100
Loans +\$90	

If Fleet charges a 10% interest rate on this loan, its revenues increase by $\$90 \times 10\%$, or \$9.

If Fleet pays only 5% on its checking account balances, its costs increase by $\$100 \times 5\%$, or \$5.

Hence, Fleet makes a profit from this process of asset transformation.

Strictly speaking, however, a fraction of the salaries paid to the bank’s tellers (who received the deposit) and loan officers (who made the loan), as well as a fraction of the costs of running the bank’s branches, must be subtracted from this profit.

3 General Principles of Bank Management

A bank manager has four basic concerns:

Liquidity management = making sure that the bank has enough cash to cover depositors’ requests for withdrawals (deposit outflows).

Asset management = acquiring assets with the highest return and the lowest risk.

Liability management = acquiring funds at the lowest cost.

Capital adequacy management = maintaining sufficient capital while still providing decent returns to shareholders.

3.1 Liquidity Management

To illustrate the basic principles of liquidity management, let's consider two examples of how a bank can cope with deposit outflows.

3.1.1 Example 1

Suppose that the required reserve ratio is 10%, but that Fleet Bank holds some excess reserves as well.

Fleet's balance sheet is:

FLEET

Assets		Liabilities	
Reserves	\$20	Checkable Deposits	\$100
Securities	\$10	Capital	\$10
Loans	\$80		

Required reserves are $\$100 \times 10\%$, or \$10. So Fleet has \$10 in excess reserves.

Now suppose that Fleet experiences a deposit outflow, either because one of its customers withdraws \$10 or because one of its customers writes a check for \$10 on his or her account.

We know from our previous analysis that, as a result of this transaction, Fleet loses \$10 in deposits and \$10 in reserves.

Fleet's balance sheet is now:

FLEET

Assets		Liabilities	
Reserves	\$10	Checkable Deposits	\$90
Securities	\$10	Capital	\$10
Loans	\$80		

Required reserves are $\$90 \times 10\%$, or \$9.

So Fleet is still meeting its reserve requirement and, in fact, still has \$1 in excess reserves.

This example shows that by holding excess reserves, a bank can cope with a deposit outflow without changing any other part of its balance sheet.

3.1.2 Example 2

Now suppose that the required reserve ratio is 10%, but Fleet holds no excess reserves.

This time, Fleet's balance sheet is:

FLEET

Assets		Liabilities	
Reserves	\$10	Checkable Deposits	\$100
Securities	\$10	Capital	\$10
Loans	\$90		

Required reserves are $\$100 \times 10\%$, or \$10. Hence, excess reserves are \$0.

If Fleet experiences a \$10 deposit outflow, it loses \$10 in deposits and \$10 in reserves.

Now it's balance sheet is:

FLEET

Assets		Liabilities	
Reserves	\$0	Checkable Deposits	\$90
Securities	\$10	Capital	\$10
Loans	\$90		

By law, Fleet must hold $\$90 \times 10\%$, or \$9, in required reserves. But right now it has no reserves at all. Hence, Fleet's manager must take action to obtain \$9 in reserves.

Fleet has three options:

Option 1: Borrow reserves as a discount loan from the Federal Reserve, borrow from another bank in the federal funds market, or borrow from a non-bank corporation by entering into a repurchase agreement.

In this case, Fleet's balance sheet becomes:

FLEET

Assets		Liabilities	
Reserves	\$9	Checkable Deposits	\$90
Securities	\$10	Borrowings	\$9
Loans	\$90	Capital	\$10

The cost of choosing this option is the interest rate on the borrowing.

Option 2: Sell securities.

In this case, Fleet's balance sheet becomes:

FLEET

Assets		Liabilities	
Reserves	\$9	Checkable Deposits	\$90
Securities	\$1	Capital	\$10
Loans	\$90		

The cost of choosing this option is the brokerage cost of selling securities. Also, the bank no longer gets the interest paid by the securities it sold.

Option 3: Reduce its loans.

In this case, Fleet's balance sheet becomes:

FLEET

Assets		Liabilities	
Reserves	\$9	Checkable Deposits	\$90
Securities	\$10	Capital	\$10
Loans	\$81		

This third option may be the most costly of all, since it might antagonize the bank's customers who want to borrow. Also, the bank no longer gets the interest that would have been paid by the borrower.

Comparing examples 1 and 2 illustrates why a bank might hold some excess reserves even though reserves do not pay interest.

If the bank does not hold excess reserves, it must meet deposit outflows by borrowing, selling securities, or reducing its loans.

All of these options are costly; excess reserves provide insurance against these costs.

3.2 Asset Management

The bank must hold a mix of assets that provides the highest return with the lowest risk.

Thus, asset management involves four basic principles:

1. Finding borrowers who will pay high interest rates but who are unlikely to default.
2. Finding securities with high returns and low risk.
3. Diversifying the bank's asset holdings to minimize risk: holding many types of securities and making many types of loans offers protection when there are losses in one type of security or one type of loan.
4. Holding some liquid assets, including excess reserves and US Treasury bills ("secondary reserves"), to protect against deposit outflows, even though the interest rate on these assets may be lower.

3.3 Liability Management

Checkable deposits are a bank's lowest-cost source of funds.

But checkable deposits are unlikely to provide a bank with all of the funds that it needs.

Thus, the bank may obtain additional funds at higher costs by issuing CDs or by borrowing from other banks (federal funds) or non-bank corporations (repurchase agreements).

3.4 Capital Adequacy Management

Recall once again that

$$\text{Capital} = \text{Assets} - \text{Liabilities} = \text{Net Worth}$$

To understand the role played by bank capital, consider two more examples.

3.4.1 Example 1

Consider two banks, one with high capital and the other with low capital.

Their balance sheets look like this:

HIGH CAPITAL BANK

Assets		Liabilities	
Reserves	\$10	Checkable Deposits	\$90
Loans	\$90	Capital	\$10

LOW CAPITAL BANK

Assets		Liabilities	
Reserves	\$10	Checkable Deposits	\$96
Loans	\$90	Capital	\$4

Now suppose that both of these banks have made \$5 loans to a company that goes bankrupt.

The value of loans at both banks falls by \$5.

And since the value of their liabilities remains unchanged, both banks also lose \$5 in capital.

HIGH CAPITAL BANK

Assets		Liabilities	
Reserves	\$10	Checkable Deposits	\$90
Loans	\$85	Capital	\$5

LOW CAPITAL BANK

Assets		Liabilities	
Reserves	\$10	Checkable Deposits	\$96
Loans	\$85	Capital	-\$1

The high capital bank still has positive net worth.

But the low capital bank is insolvent (bankrupt).

This example shows how capital serves as a cushion against a drop in the value of the bank's assets.

3.4.2 Example 2

If capital is a cushion against a drop in the value of the bank's assets, then why don't all banks have high capital?

To answer this question, let's consider the high capital bank again, before the \$5 loan went bad:

HIGH CAPITAL BANK

Assets		Liabilities	
Reserves	\$10	Checkable Deposits	\$90
Loans	\$90	Capital	\$10

Suppose next that this bank receives \$6 in new deposits, but instead of holding the \$6 as additional excess reserves, loaning the money out, or buying securities, the bank decides to pay the \$6 out as an extra dividend to its shareholders.

Now the bank's balance sheet is:

HIGH CAPITAL BANK

Assets		Liabilities	
Reserves	\$10	Checkable Deposits	\$96
Loans	\$90	Capital	\$4

This example shows that by lowering its level of capital, the bank can pay more dividends to its shareholders.

Thus, the bank faces a trade-off:

By maintaining more capital, it protects itself against a decline in the value of its assets.

But by maintaining less capital, it can pay more dividends and thereby provide its shareholders with a better return on their investment.

4 Conclusion

By looking at a bank's balance sheet, we can see how banks are involved in the process of asset transformation: they sell liabilities with one set of characteristics and use the proceeds to acquire assets with a different set of characteristics.

By engaging in asset transformation, the bank hopes to profit by charging a higher interest rate on its assets than it must pay on its liabilities.

Thus, a bank manager must be concerned with both asset management (acquiring assets with the highest return and the lowest risk) and liability management (acquiring funds at the lowest cost).

But a bank manager has to additional concerns as well:

Liquidity management = making sure that the bank has enough cash to cover deposit outflows (hold some excess reserves, even though they do not pay interest).

Capital adequacy management = maintaining sufficient capital as a cushion against a decline in the value of the bank's assets, while still providing a decent return to the bank's shareholders.