Course: Economics I (macroeconomics)

Study text

8th Chapter

Banking System and Deposit Multiplication

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8 Banking system and deposit multiplication

In this chapter, we will learn the structure of the banking system, banking system functions, objectives and functions of the central bank and commercial banks; we will admit the possibility of making money in the banking system and adopt the process of multiplication of bank deposits. We will discuss the terms of deposits generating, define simple multiplier of deposits, the monetary base and the money multiplier. In conclusion, we will discuss the factors influencing the money multiplier.

At a time when metal coins circulated, their amount was usually determined by the ruler who was the guarantor of the correct weight and internal content of precious metal in coins. Spreading of paper money needed an institution that issued paper money and mended for it. These institutions became the central banks. Gradually, with the development of the banking system, competences of central banks were expanded in the form of over the supervision over the activities of commercial banks and money supply regulation. Emission banks became central banks.

8.1 Banking system

The banking system consists of depository institutions (bank and non-bank). These institutions take deposits and provide loans. Banks are indirect financial intermediaries, allowing the movement of funds from creditors towards borrowers.

The banking system is usually **a two-step**. It consists of:

- ***central bank,***

- ***a net of commercial banks.***

This system is common in the most of market economies. In the United States, the structure of the banking system differs. It consists of the Federal Reserve System (Fed) - the central banking system of the United States, and a network of commercial banks. The Federal Reserve System is a private institution, where the state has influence on the composition of its management, and it is composed of 12 independent regional private banks (according 12 regions - districts). Board of Governors of the Federal Reserve System is based in Washington.

Banks have the following **two basic functions for the economy**:

1. **banks transfer the money** from those who save money towards those who borrow funds,

2. **banks can make extra money** by providing loans from its free funds (the excess of total reserves).

Banks allow transferring money from creditors towards borrowers, thereby increasing the efficiency of resource utilization in the economy. If people save their cash under

the pillow and not to depository institutions, banks would not lend money towards investing companies.

The basic functions of **commercial banks** are accepting deposits, making loans and conducting brokerage operations. Commercial Bank focuses profitably, trying to maximize the difference between interests received from loans and interests that commercial bank pays its creditors.

The Central Bank supervises the **solvency and liquidity** of commercial banks. **Solvency** of the bank is the bank´s ability to meet its obligations in crisis situations. Insolvency may cause a situation called "run on the banks". In this situation, the bank depositors lose confidence and suddenly everyone is wishing to withdraw cash. Holding of required reserves is aimed to prevent this situation. The central bank acts as lender of last instance. The bank´s **liquidity** is the ability of banks to convert their assets into liquid form.

The central bank usually takes the form of individual institutions like the Czech National Bank (CNB). Its aim is not to make profit, it is the non-business operator and itperforms the following functions:

- *emission function* - the central bank has the sole power to issue new money or withdraw old money from circulation;

- *supervision of commercial banks* – the central bank grants banking license, supervises the money and capital markets, has the right to examine the legality of banking institutions;

- *monetary policy* - central bank conducts monetary policy through administrative and market instruments - sets the discount rate, rate of minimum reserves, carries out open market operations, etc.;

- bank of banks – the central bank may provide loans to commercial banks, establishes rules for commercial lending;

- *bank of the state* - the central bank conducts financial operations of government and it administers the national debt;

- *management of foreign exchange reserves* - central bank holds foreign reserves to secure foreign currency liquidity of the country (foreign exchange reserves consist of securities denominated in foreign currencies, cash and gold);

- *representation of the banking system and the state* in the field of international monetary relations and organizations.

The basic objective of the central bank is usually to **preserve the quality of the currency or purchasing power of money.** This goal can be fulfilled only in terms of price stability.

Under Article 98 of the Constitution of the Czech Republic and Act no. 6/1993 Coll., On the Czech National Bank, the main objective of the Czech National Bank (CNB) is to **maintain price stability**. By achieving and maintaining price stability, i.e. low-inflation environment in the economy, the central bank´s ongoing contribution is to create conditions for sustainable economic growth.

8.2 The multiplication of bank deposits

The process of money creation will focus on the generation of deposits (deposits on demand) system in commercial banks. The method of generating deposits is perturbed by a central bank whose main task is to oversee the stability of the banking system, mediate some relationships between commercial banks and especially regulating the amount of money in the economy to ensure the stability of the price level.

Deposits at sight form a part of the liabilities in the balance sheet of commercial banks. Banks accept deposits for their transformation into loans. But commercial banks are limited by the reserves requirements (RR). They are determined as a percentage of deposits received. Commercial banks are obliged to hold reserves in the form of deposits on account of a central bank or vault cash at the bank. Tab. 8.1 shows the balance sheet of commercial banks. The basic equation of the balance sheet is following:

$$assets = liabilities + equity$$

Assets are relating to the ownership of a business. They include cash, loans, securities and reserves. Liabilities of commercial banks comprise commitments to economic operators and they include demand deposits, savings deposits and term deposits (e.g. passbooks). The equity represents funds provided by its owners, and the bank´s profit before distribution.

Tab. 8.1 Balance sheet of a commercial bank

Assets	Liabilities
Cash	
Receivables towards a central bank: • mandatory minimal reserves • excess reserves	Liabilities towards clients: • sight deposits • term deposits
Loans	• saving deposits

Securities	
Tangible assets	Equity
Other assets	Other liabilities
TOTAL	**TOTAL**

Bank deposits of commercial banks deposited in an account at the central bank represent total bank reserves. If the rate of minimum reserves is fixed at 10 %, commercial banks have to hold in reserves 10 % of each newly received deposit and these reserves can not be used for their commercial purposes (lending money).

Mandatory minimum reserves (reserves requirements) are counted as minimum reserve requirement (r) multiplied by the sum of demand deposits (D):

reserves = r . D

Excess reserves makes up the difference between the total bank reserves and mandatory minimum reserves. Commercial banks may provide loans to the amount of their excess reserves.

The process of making bank deposits can by selling securities held by a commercial bank in the amount of 1,000,- to the central bank. Assume the rate of minimum reserves of r = 10 %. In the balance sheet of commercial bank the new deposit 1000 – is divided into RR of 100,- (10% of 1000, -) and the amount of 900, - may be provided as a loan (see bank of the 1st stage).

Bank of the 1st stage

Assets		Liabilities	
reserves	+ 100,-	deposits	+ 1 000,-
loans	+ 900,-		

Assume this bank makes a loan to Mr. Novak of amount 900,- for the purchase of a good. The payment goes to another bank´s account. We talk about bank of the second stage and this operation will occur as following.

Bank of the 2nd stage

Assets		Liabilities	
reserves	+ 90,-	deposits	+ 900,-

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loans	+ 810,-	

The bank of second stage will provide a loan to Mr. Benda of amount 810,- for the purchase of a good. This payment goes to account at a bank of 3rd stage. The liabilities are increased by 810,- and the amount of 729,- can be loaned.

Bank of the 3rd stage

Assets		Liabilities	
reserves	+ 81,-	deposits	+ 810,-
loans	+ 729,-		

…

The process of making deposits could continue until the deposit growth was zero. We can see that the deposits form on bank accounts and are always reduced by the amount of reserves requirements. The condition for their multiplication, however, is that the bank of a stage is able to turn deposits into loans, in our text it is 90 % of new deposits. The full process of generating deposits is described in the following tab. 8.2.

Tab. 8.2 Deposit multiplication

Commercial bank of	Increase in deposits (€)	Increase in loans (€)	Increase in reserves (€)
1st stage	1 000,-	900,-	100,-
2nd stage	900,-	810,-	90,-
3rd stage	810,-	729,-	81,-
4th stage	729,-	656.1,-	72.9,-
…	…	…	…
Nth stage	0,-	0,-	0,-
Total	**10 000,-**	**9 000,-**	**1 000,-**

To sum the total volume of newly created deposit we use formula of the sum of the geometric series:

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$$\Delta D = \frac{1}{r} \cdot \Delta R$$

ΔD = overall increase of potential deposits;

ΔR = increase of reserves in the banking system (new money), here of 1000,-;

r = reserves ratio.

The fraction $\frac{1}{r}$ will be referred to as a simple deposit multiplier. It is the reciprocal of the reserves ratio (r).

This process of making the deposits works in the opposite direction, in which case we are talking about the contraction of bank deposits - reducing the money supply.

The monetary base (powerful money) consist of reserves held by commercial banks at the central bank and currency outside the banking sector and passes through multiplication. The monetary base is the central bank´s instrument aimed to regulate the money supply in circulation. Money supply depends on the money multiplier (m) and powerful money in the following way:

$$S_M = MB \cdot m$$

S_M = money supply,

MB = monetary base,

m = money multiplier.

Money multiplier (m) indicates how many times the money supply changes when the monetary base is changed by the unit.

Size of money multiplier is influenced by many factors, including:

- *public behavior influencing* proportions of holding liquid assets (currency, deposits),

- *behavior of the central bank influencing mandatory reserves for sight deposits and term deposits,*

- *behavior of commercial banks* affecting the amount of total reserves.

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