

## Money creation mechanism in the fractional reserve system

monetary base: 100,- EUR

reserve requirement: 20%

Money creation by commercial banks			
Bank	Amount deposited	Amount lent out	Obligatory reserve deposited in the central bank
A	100	80	20
B	80	64	16
C	64	51.20	12.80
D	51.20	40.96	10.24
E	40.96	32.77	8.19
F	32.77	26.21	6.55
G	26.21	20.97	5.24
H	20.97	16.78	4.19
I	16.78	13.42	3.36
J	13.42	10.74	2.68
K	10.74		
			Total reserves:
			89.26
	Total amount of deposits	Total amount of loans	Total reserves + last deposit
	457.05	357.05	100
	Total money creation = central bank money (monetary base) + money created by commercial banks	money created by commercial banks	central bank money (monetary base)
	457.05	357.05	100

### Formula

**Money multiplier**  $m$ , is the inverse of the reserve requirement,  $R$

$$m = \frac{1}{R}$$

Money multiplier indicates the **maximum** amount of money that can be created with the specified monetary base and specified reserve requirement. **Actual creation of money** depends on how much money is actually lent out by banks and returns to the banking system as deposits.

## Example

Reserve requirement  $R = 20\% = 1/5$

$$m = 1/\frac{1}{5} = 5$$

First deposit (in our example 100 EUR) multiplied by the money multiplier indicates maximum money creation by the banking system.

With the reserve requirement of 20%, maximum level of money supply arising from the monetary base of 100 EUR is 500 EUR, including 100 EUR of the monetary base and 400 EUR of money created by commercial banks.

*Source: Wikipedia, entry on "Money multiplier"*

Actual reserve requirements are much lower than the ratio used in the above example, which means that commercial banks can create much more money from the monetary base than indicated above.

Reserve requirement in Poland is currently (as of 14.10.2023) set at 3,50 % for all kinds of deposits, except for amounts obtained by repo and sell-buy-back transactions to which the reserve requirement does not apply. A lump-sum equivalent to 500.000 EUR is deducted from the required reserve of each bank (Article 39a of the Law on the NBP).

The NBP pays interest of 5,75% on funds deposited as mandatory reserve.

*Source: NBP website <https://nbp.pl/en/monetary-policy/mpc-decisions/interest-rates/>*

Minimum reserve requirements for credit institutions in the euro area are calculated according to the rate of 1%, with standardised deductions for some specified kinds of deposits and a lump-sum deduction of 100.000 EUR for each credit institution subject to the minimum reserve requirement.

National central banks of the euro area pay 3,75% interest on funds deposited as minimum reserve.

*Source: ECB website*

<http://www.ecb.europa.eu/mopo/implement/mr/html/calc.en.html>

<http://www.ecb.europa.eu/mopo/implement/mr/html/index.en.html>