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Banks and central bank

Theory of banking
2015-2016

Banks - definitions

- ✓ The detailed definition of a bank may vary from country to country

- ✓ Broadly speaking, a bank is a financial institution that:
  - lends money to a borrower
  - receives money from an investor-depositor

  - ➢ Typically used as regulators' definition
  - ➢ Under Italian law, banking activity is defined as the joint exercise of the activity of collecting savings from the public and the activity of granting credit

  (art. 10 of the Banking Law, Legislative Decree 1 September 1993 no. 385 and subsequent amendments and additions)

Banks – definitions (2)

- ✓ Broadly speaking, a bank is a financial institution that:
    - lends money to a borrower
    - receives money from an investor-depositor

- ✓ Lending activities can be performed either directly or indirectly through capital markets

- ✓ Banks are highly regulated in most countries
    - regulations intended to ensure liquidity
    - subject to minimum capital requirements based on an international set of capital standards, known as the Basel Accords

(simplified)
banks' balance sheet

Required Reserves	
Excess Reserves	Deposits
Loans	Debt securites
Securities	
	Capital

Banks – definitions (3)

- ✓ Broadly speaking, a bank is a financial institution that:
  - lends ***money*** to a borrower
  - receives ***money*** from an investor-depositor

- ✓ As deposits are one of the quantitatively most important components of ***money***, banks play a key role in the transmission of ***monetary*** policy by the central bank to the entire economy
  - ➢ creates credit by lending money to a borrower, thereby creating a corresponding deposit on the bank's balance sheet

- ✓ From this point of view, what distinguishes banks from other financial intermediaries is the special nature of their liabilities
  - ➢ customers can use the amounts deposited in the form of current account to make "transactions" (i.e., payments) by means of payment instruments such as checks, bank-transfers, debit cards, ATM payments

Central banks - definitions

- ✓ A central bank is an institution that manages money supply
- ✓ A central bank possesses a **monopoly** on increasing/decreasing the monetary base in the state, and usually also prints the national currency which usually serves as the state's legal tender
- ✓ The primary function of a central bank is to control the nation's money supply (monetary policy), through tools such as managing interest rates, setting the reserve requirement, and acting as a lender of last resort to the banking sector
- ✓ Central banks also usually oversee the commercial banking system of their respective countries intended to prevent bank runs and to reduce the risk that commercial banks and other financial institutions engage
- ✓ Central banks in most developed nations are institutionally designed to be independent from political interference

Central banks – definitions (2)

- ✓ Functions of a central bank may include:
  - implementing monetary policies
  - setting the official interest rate
  - the Government's banker and the bankers' bank ("lender of last resort")
  - managing the country's foreign exchange and gold reserves

- ✓ Monetary policy is the process by which the monetary authority of a country controls the supply of money to ensure **price stability** and general trust in the currency

- ✓ Why price stability?
  - ➢ M ⇨ P

- ✓ Further goals of a monetary policy are usually to contribute to economic growth and stability, to lower unemployment, and to maintain predictable exchange rates with other currencies

Money - definitions

- ✓ Classically it is said that money acts as:
  - a unit of account
  - a store of value
  - a medium of exchange

- ✓ In economics, money is a broad term that refers to any financial instrument that can fulfill the functions of money

- ✓ Money is any item or verifiable record that is generally accepted **as payment** for goods and services and repayment of debts in a particular country or socio-economic context, or is easily converted to such a form. Any item or verifiable record that fulfills these functions can be considered money
  - ➢ The money supply of a country consists of:
    - ➢ currency (banknotes and coins)
    - ➢ bank money: deposits, i.e. the balances held in checking accounts, savings accounts, and other types of bank deposits)

Money: $M = C + D$

  - ➢ Market liquidity describes how easily an item can be traded for another item, or into the common currency within an economy. Money is the most liquid asset because it is universally recognized and accepted as the common currency

Money – definitions (2)

- ✓ The control of the amount of money in the economy is known as monetary policy
- ✓ Monetary policy is the process by which central banks (or another monetary authority) manages the money supply to achieve specific goals
- ✓ Usually the goal of monetary policy is to have stable prices (or even to accommodate economic growth in an environment of stable prices)

- ✓ In the US, the Federal Reserve (Fed) is responsible for controlling the money supply, while in the Euro area the respective institution is the European Central Bank (ECB).

- ✓ Some of the tools used to control the money supply include:
  - changing the interest rate at which the central bank loans money to (or borrows money from) the banks
  - currency purchases or sales
  - manipulation of exchange rates
  - raising or lowering bank reserve requirements
  - regulation or prohibition of private currencies

Money creation

(simplified) banks' balance sheet	
Required Reserves	
Excess Reserves	Deposits
Loans	Debt securites
Securities	
	Capital

(over-simplified) banks' balance sheet	
Required Reserves	
Excess Reserves	Deposits
Credits	

Deposits: D

Credits: CR = Loans + Securities

Reserves: R = Required Reserves + Excess Reserves

$R = RR + ER$

Required Reserves: $RR = rD$

Excess Reserves: $ER = eD$

Money creation (2)

(simplified) banks' balance sheet	
Required Reserves Excess Reserves Loans Securities	Deposits Debt securites Capital

(over-simplified) banks' balance sheet	
Required Reserves Excess Reserves Credits	Deposits

Deposits: D

Credits: CR = Loans + Securities

Reserves: R = Required Reserves + Excess Reserves

R = RR + ER

Required Reserves: RR = rD

Excess Reserves: ER=eD

Currency in circulation: C=cD

Money: M = D + C

Monetary Base: MB = R + C

Money creation (3)

(semplified)
banks' balance sheet

Required Reserves Excess Reserves Loans Securities	Deposits Debt securites Capital

(over-semplified)
banks' balance sheet

Required Reserves Excess Reserves Credits	Deposits

Deposits:	D
Credits:	$CR = \text{Loans} + \text{Securities}$
Reserves:	$R = \text{Required Reserves} + \text{Excess Reserves}$
	$R = RR + ER$
Required Reserves:	$RR = rD$
Excess Reserves:	$ER=eD$
Currency in circulation:	$C=cD$
Monetary Base:	$MB = R + C$
Money:	$M = D + C$

RR ratio depends on CB

ER ratio depends on the banks

Currency ratio depends on the depositors

Monetary and credit multipliers

✓ **Deposit multiplier**

$$MB = R + C$$
$$MB = RR + ER + C$$
$$MB = rD + eD + cD$$
$$MB = (r + e + c)\,D$$

$$D = 1/r + e + c \;\; \text{MB}$$

✓ **Credit multiplier**

$$D = R + CR$$
$$D = RR + ER + CR$$
$$D = rD + eD + CR$$
$$(1 - r - e)\,D = CR$$

$$CR = 1 - r - e/r + e + c$$
$$\text{MB}$$

✓ **Money multiplier**

$$M = D + C$$
$$M = D + cD$$
$$M = (1 + c)\,D$$

$$M = 1 + c/r + e + c \;\; \text{MB}$$

Monetary and credit multipliers (2)

✓ **Deposit multiplier**

MB = R + C

MB = RR + ER + C

MB = rD + eD + cD

MB = (r+e+c) D

$$D=1/r+e+c \; MB$$

multipliers > 1

… tell how much monetary and credit aggregates change in response to a given change in the monetary base

✓ **Credit multiplier**

D = R + CR

D = RR + ER + CR

D = rD + eD + CR

(1−r − e) D = CR

$$CR=1-r-e/r+e+c \; MB$$

✓ **Money multiplier**

M = D + C

M = D + cD

M = (1 + c) D

$$M=1+c/r+e+c \; MB$$

An example

Individual Bank	Amount Deposited	Lent Out	Reserves
A	100.00	80.00	20.00
B	80.00	64.00	16.00
C	64.00	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 Lent Out:**	**Total Reserves + Last Amount Deposited:**
	457.05	357.05	100.00

Normal times

- *c* tends to remain rather constant and predictable
- if banks maintain low levels of excess reserves *e*, as they typically do, then CBs can control *D*, *M* and *CR*

➢ One can see the process concerning money creation in a fractional-reserve banking system in two ways:
  - either reserves are first injected by the central bank, and then lent on by the commercial banks (mainstream economics)
  - or loans are first extended by commercial banks, and then backed by reserves borrowed from the CB (endogenous money)

Financial crisis

- If, on the other hand, banks accumulate excess reserves, as occurred in the financial crisis, this relationship breaks down and CBs can force the broad money supply to shrink, but not force it to grow
  - increases in CBs' supply of money may not result in *D*, *M* and *CR* because the money is not *required* to be lent out – it may instead result in a growth of non-lent reserves (excess reserves)
  - CBs may *compel* banks to curtail lending (one can *pull* money via this mechanism), but cannot compel banks to lend (one cannot *push* via this mechanism)