Fiscal & Financial System in Japan A

2010 Spring

Session 11

Money Supply Process

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7. Money Supply Process (Mishkin Ch.9,15,16)

Money Stock and Commercial Banks

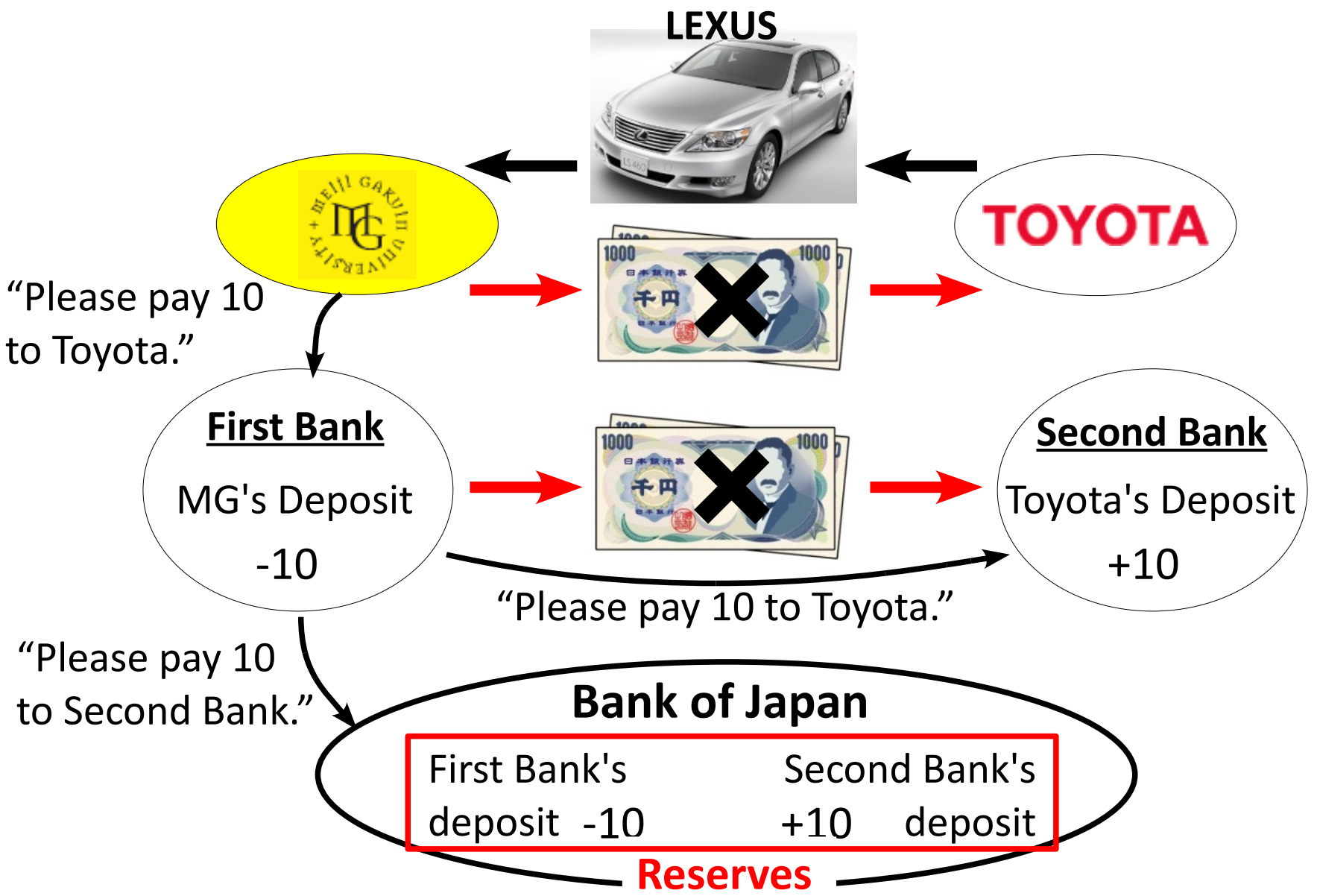
Deposits at commercial banks are the largest component of Japan's money stock, and accounts for 85% of M1. (March 2010)

→ Commercial banks also play a major role in the determination of money stock.

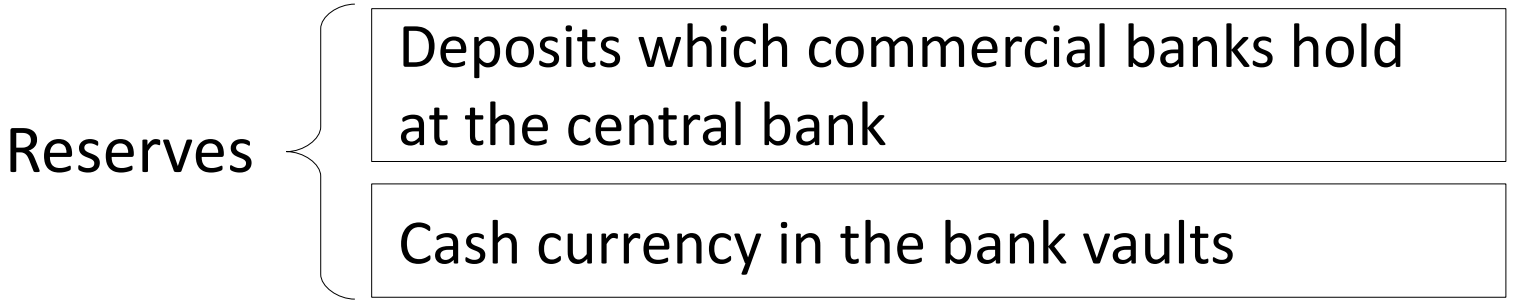
→ (1) How do banks supply/create deposits?

(2) How can the central bank, the Bank of Japan, affect the process?

Deposits as a Means of Settlement



Reserves



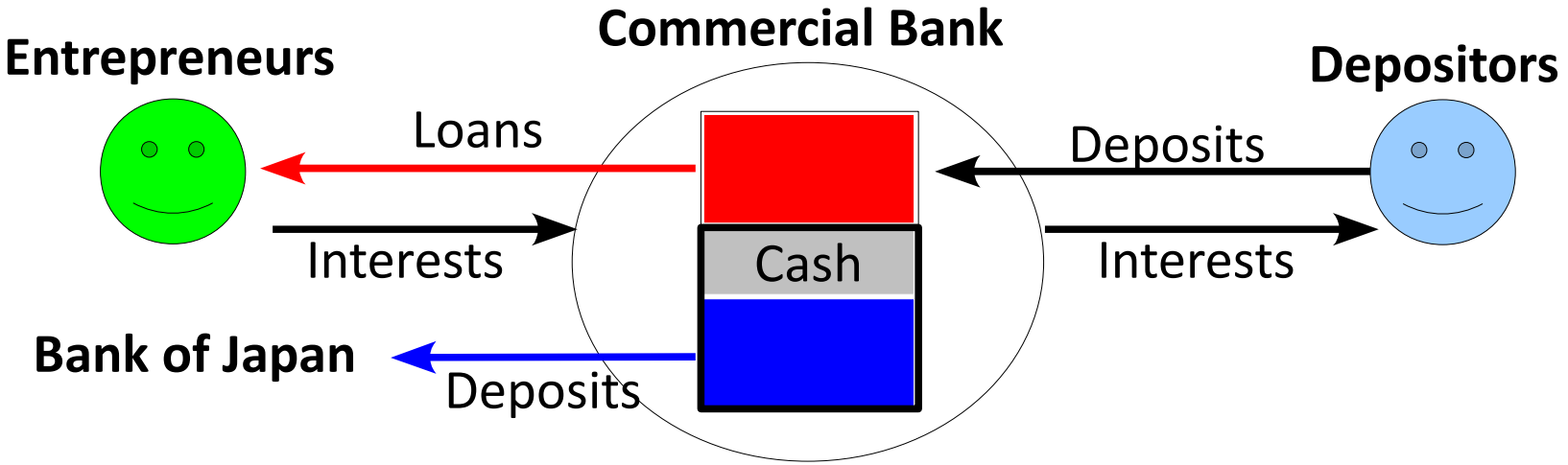
Reserves are “the most liquid assets”;

Deposits at the central bank can, at any time, be withdrawn and converted into cash, with which banks can meet the customers' requests of withdrawal. *Note that our deposits at commercial banks are not as liquid, because commercial banks sometimes fail to meet our requests.*

But reserves do not pay any interest (“the least profitable assets”);

Central banks do not pay interests on deposits. (*)
Cash currency in the bank vaults earns no interest.

Commercial Banks



Commercial banks hold profitable (but illiquid) assets such as loans to earn yields and pay interests to the depositors.

Commercial banks hold highly liquid assets, reserves, to meet the obligation when funds are withdrawn.

Commercial banks are legally required to hold a certain fraction of deposits in reserves.

Required reserve ratio

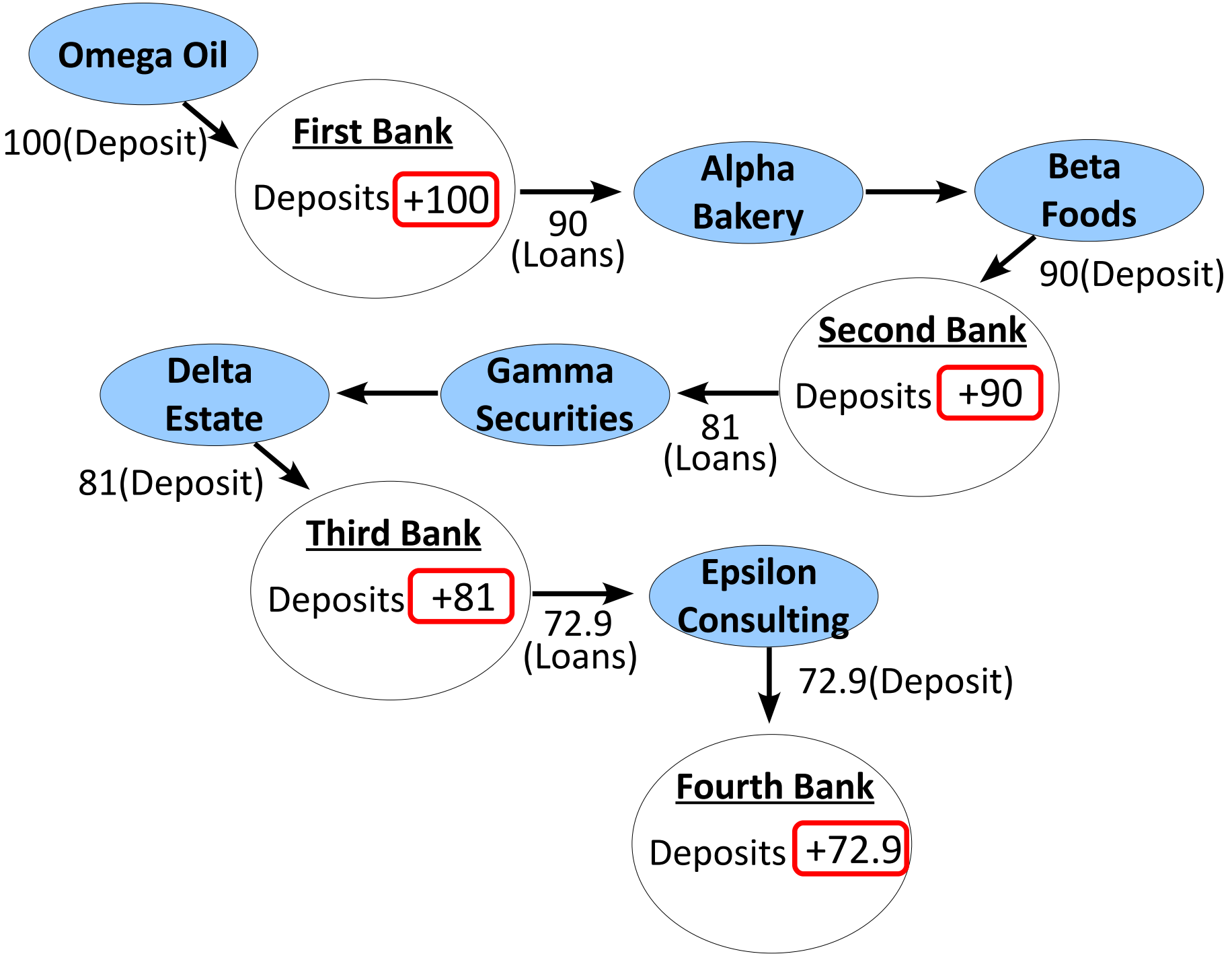
Multiple Creation of Deposits:Example

Assumption: Required reserve ratio is 10 percent, and banks do not hold any excess reserves.

Omega Oil deposits 100 million yen at *First Bank*.

- *First Bank* holds 10 reserves, and lends the rest 90 to *Alpha Bakery*, which pays 90 to *Beta Foods* for its purchase of ingredients.
- *Beta Foods* deposits 90 at *Second Bank*.
- *Second Bank* holds 9 reserves, and lends 81 to *Gamma Securities*, which pays 81 to *Delta Estate* for its purchase of a building.
- *Delta Estate* deposits 81 at *Third Bank*.

The process goes on ...


Omega Oil
100(Deposit)
First Bank
Deposits +100
90
(Loans)
Alpha Bakery
Beta Foods
90(Deposit)
Second Bank
Deposits +90
81
(Loans)
Gamma Securities
Delta Estate
81(Deposit)
Third Bank
Deposits +81
72.9
(Loans)
Epsilon Consulting
72.9(Deposit)
Fourth Bank
Deposits +72.9

Total Effects on Money Stock

Sum of increases in deposits = $100 + 90 + 81 + 72.9 + \cdots$

1st Round 100

2nd Round $100 - 100 \times 0.1 = 100 \times (1 - 0.1) = 90$

3rd Round $90 - 90 \times 0.1 = 90 \times (1 - 0.1) = 100 \times (1 - 0.1)^2 = 81$

4th Round $81 - 81 \times 0.1 = 81 \times (1 - 0.1) = 100 \times (1 - 0.1)^3 = 72.9$

$\vdots$

Multiplying this round by (1 - 0.9) yields next round.

"An infinite geometric series"

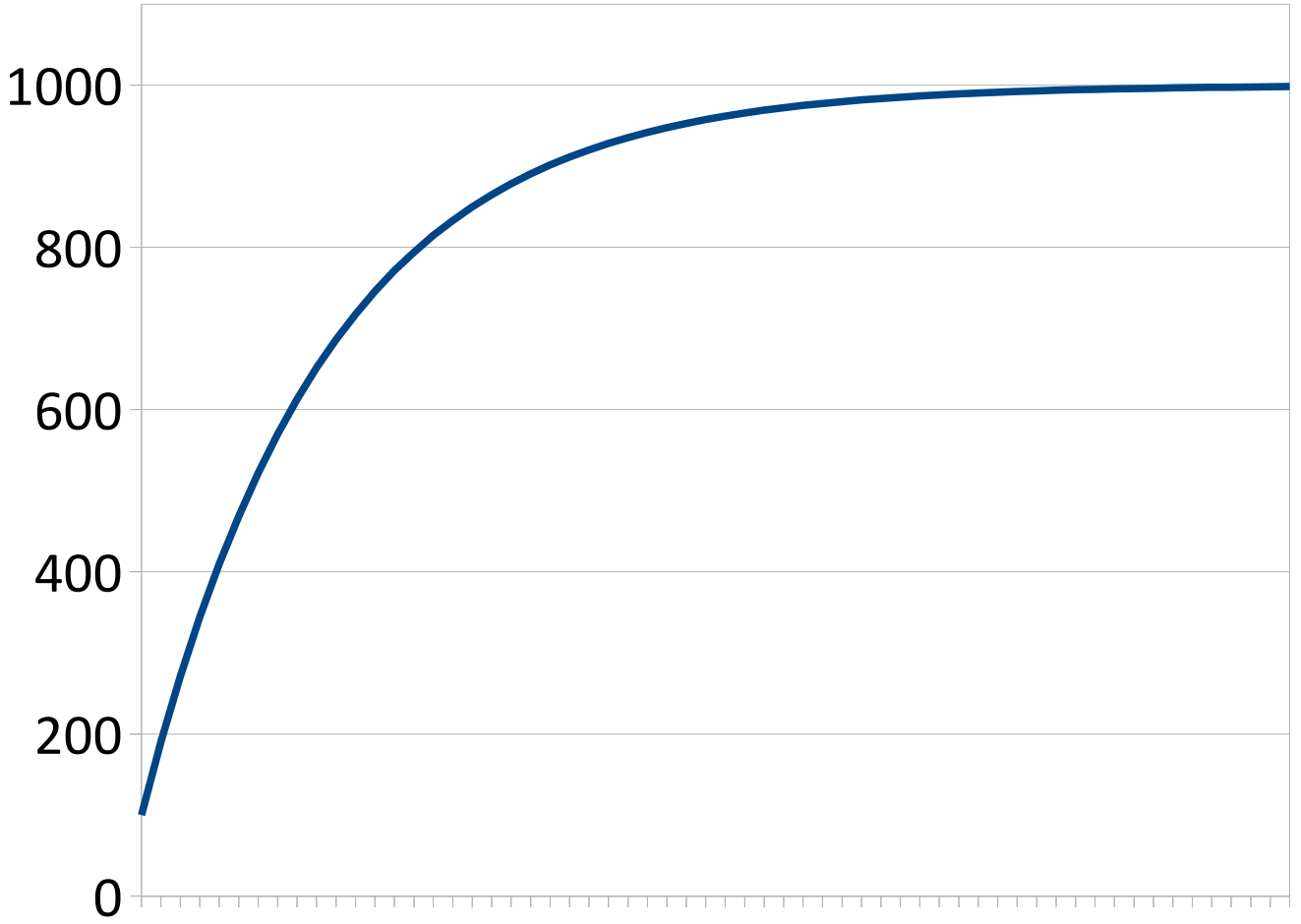
$$100 + 100 \times (1 - 0.1) + 100 \times (1 - 0.1)^2 + 100 \times (1 - 0.1)^3 + \cdots$$

Sum of an infinite series goes to infinity?

Total Effects on Money Stock

Deposits do **not** expand infinitely.

Deposits do **converge** to some particular level.



Total Effects on Money Stock

Mathematical Note

Sum of an infinite geometric series is, if $-1<x<1$, given by

$$1+x+x^2+x^3+\cdots=\frac{1}{1-x}$$

Sum of increases in deposits

$$=100+90+81+72.9+\cdots$$

$$=100+100\times(1-0.1)+100\times(1-0.1)^2+100\times(1-0.1)^3+\cdots$$

$$=100\times\{1+(1-0.1)+(1-0.1)^2+(1-0.1)^3+\cdots\}$$

$$=100\times\frac{1}{1-(1-0.1)}=100\times\frac{1}{0.1}$$

Money Multiplier

Sum of increases in deposits $= 100 \times \frac{1}{0.1}$

Initial injection of reserves

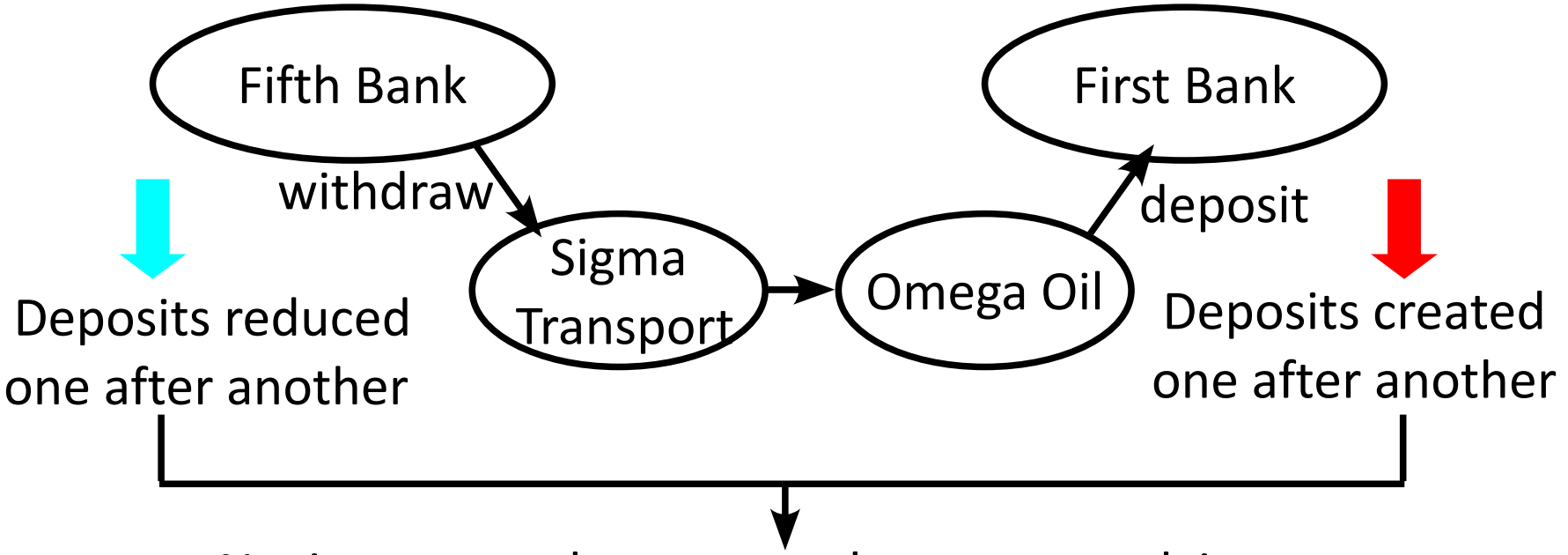
Inverse of reserve ratio

Money multiplier

An initial increase in reserves of a bank, after all, creates 10 times as large deposits in the economy as a whole.

The central bank can affect money stock by changing reserves that the commercial banks hold.

Economy as a Whole

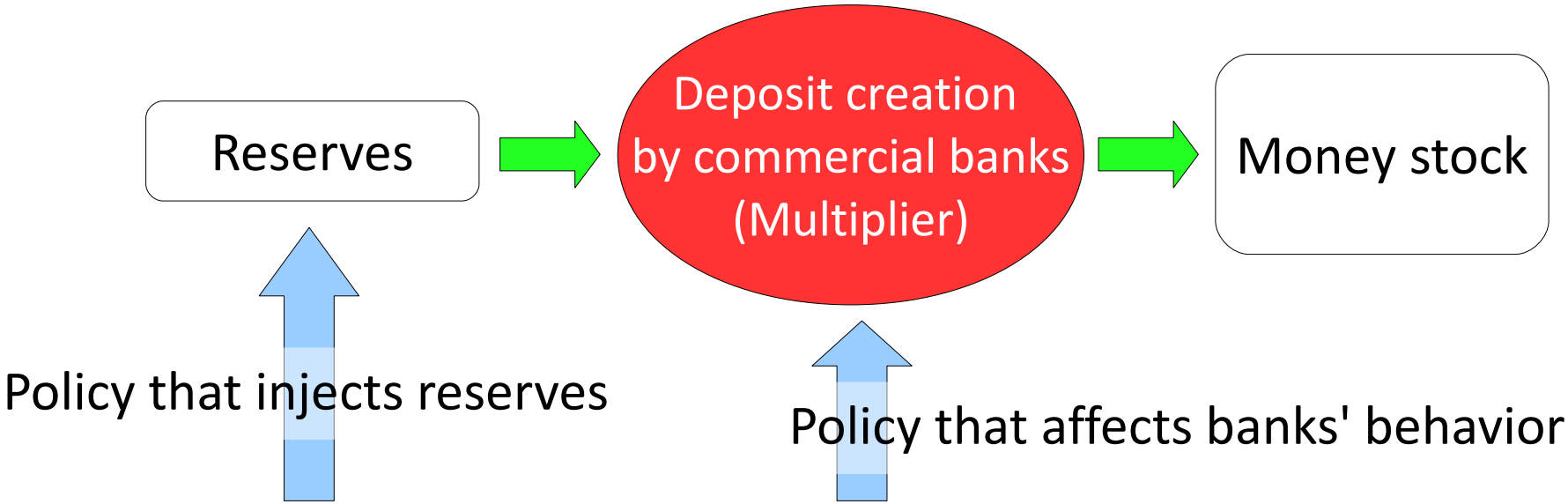


Only an injection of reserves <u>from the outside of the system of commercial banks</u> can expand the money stock.

Only <u>the central bank</u> can inject new cash into the system of commercial banks.

How? → Tools of monetary policy

Monetary Policy



<u>Discount policy</u>

Make loans to commercial banks

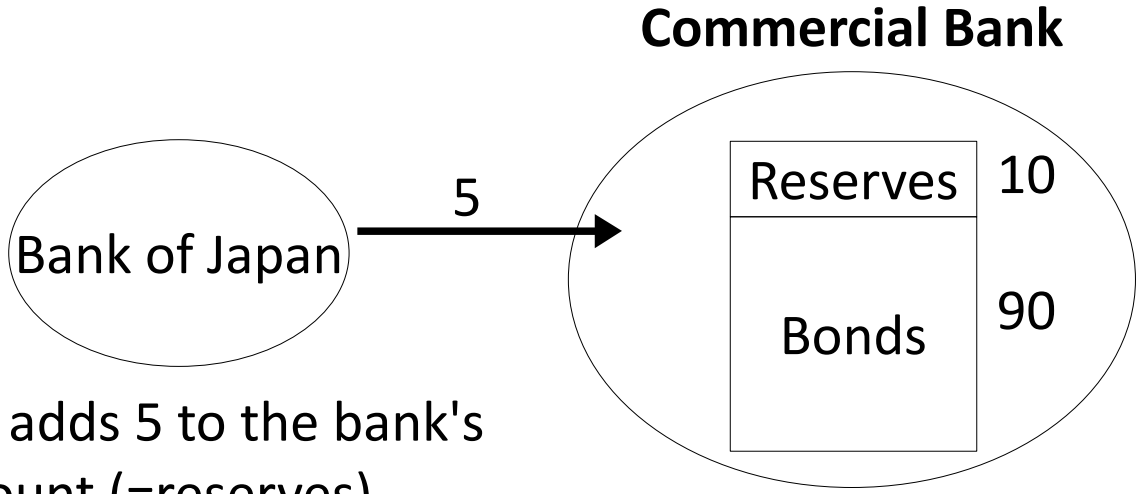
<u>Open Market Operation</u>

Trade bonds with banks, changing the reserves they hold

<u>Changes in required reserve ratio</u>

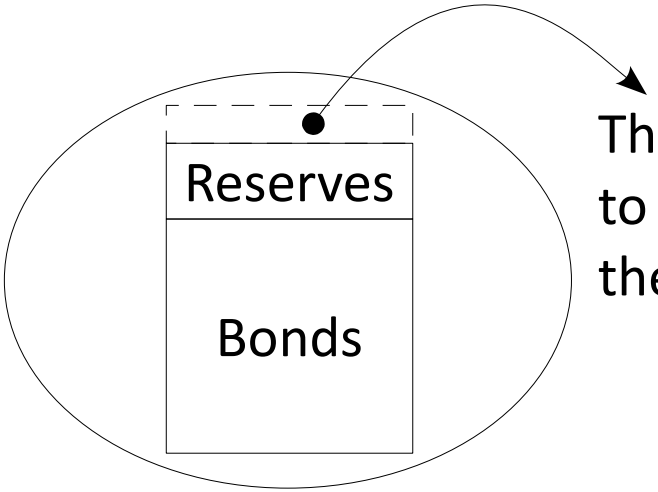
Change required reserves to affect banks' lending behavior

Discount Loan



BOJ adds 5 to the bank's account (=reserves).

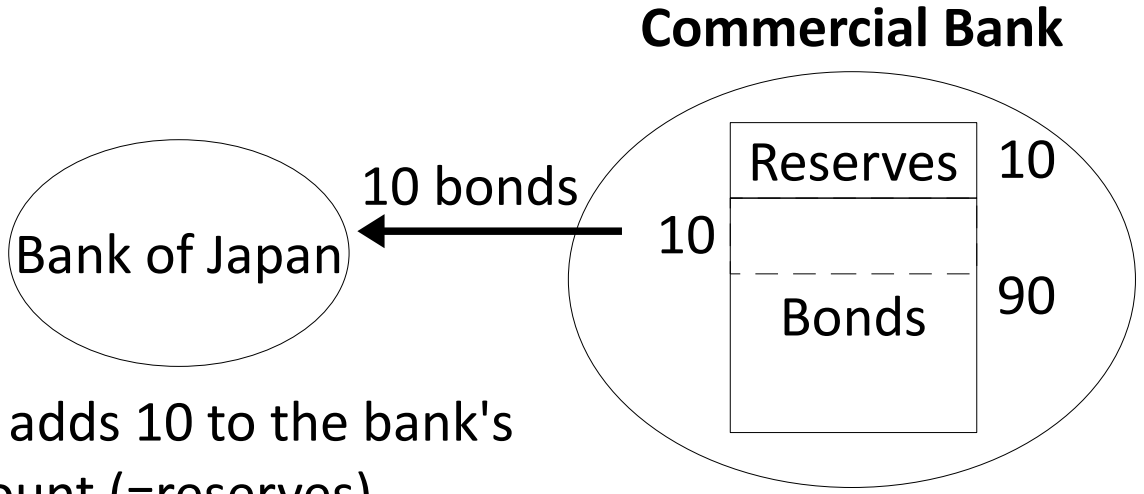
Bank's liquid assets exceed the legal requirement.



The bank lends excess reserves to earn interests, thus starting the process of deposit creation.

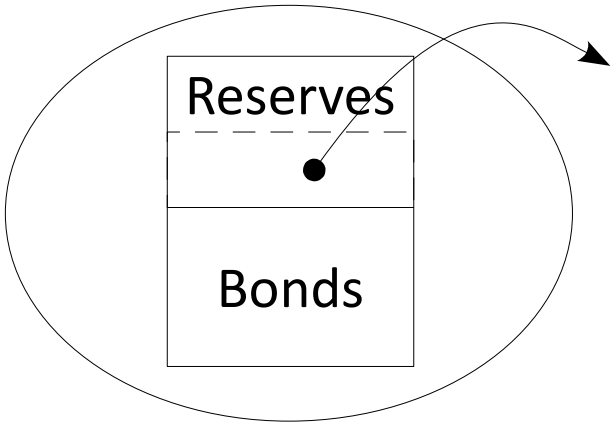
Bank's liquid assets exceed the legal requirement.

Open Market Purchase



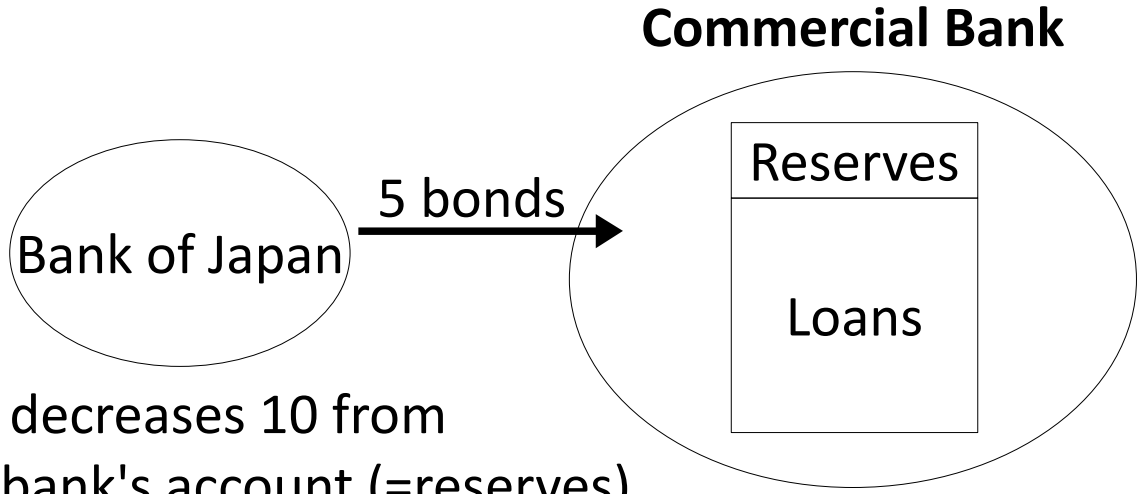
BOJ adds 10 to the bank's account (=reserves).

Part of bank's illiquid assets is replaced by liquid assets.



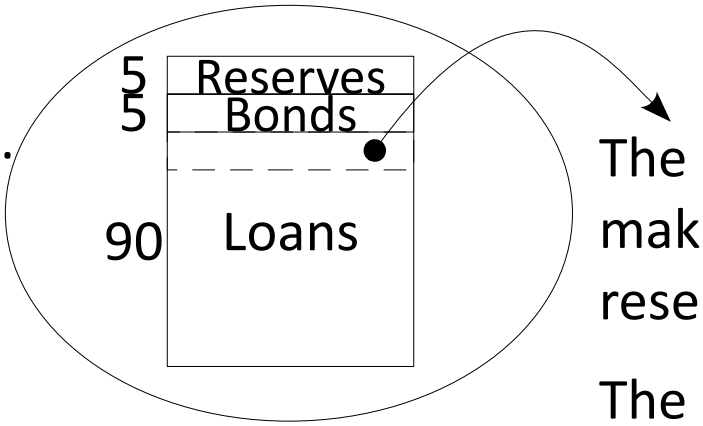
The bank lends excess reserves to earn interests, thus starting the process of deposit creation.

Open Market Sale



BOJ decreases 10 from
the bank's account (=reserves).

Part of bank's liquid assets
is replaced by illiquid assets.

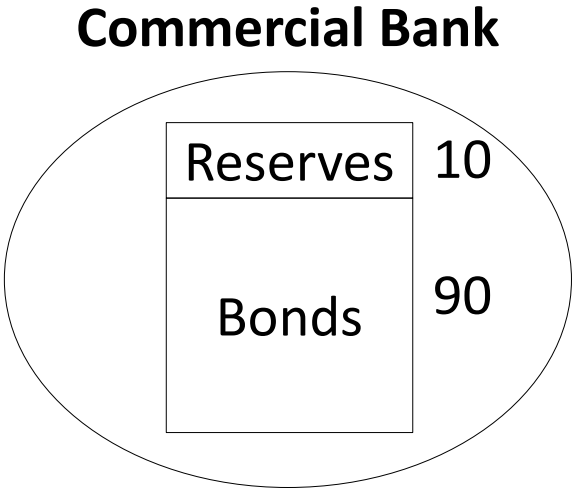


The bank collects part of loans, making up for the lack of reserves.

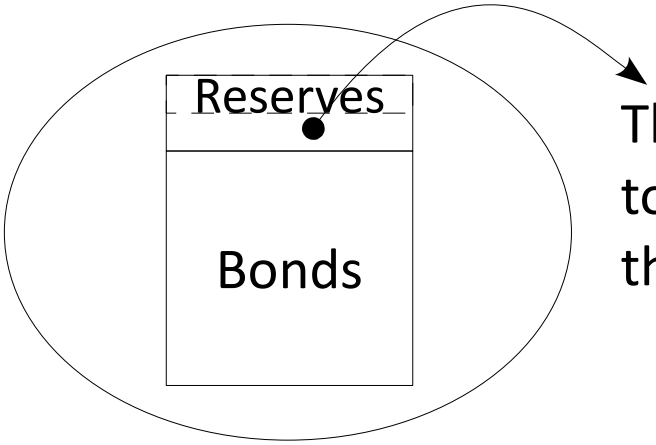
The inverse process of deposit creation starts.

Changes in Required Reserve Ratio

BOJ reduces the required reserve ratio to 0.05.

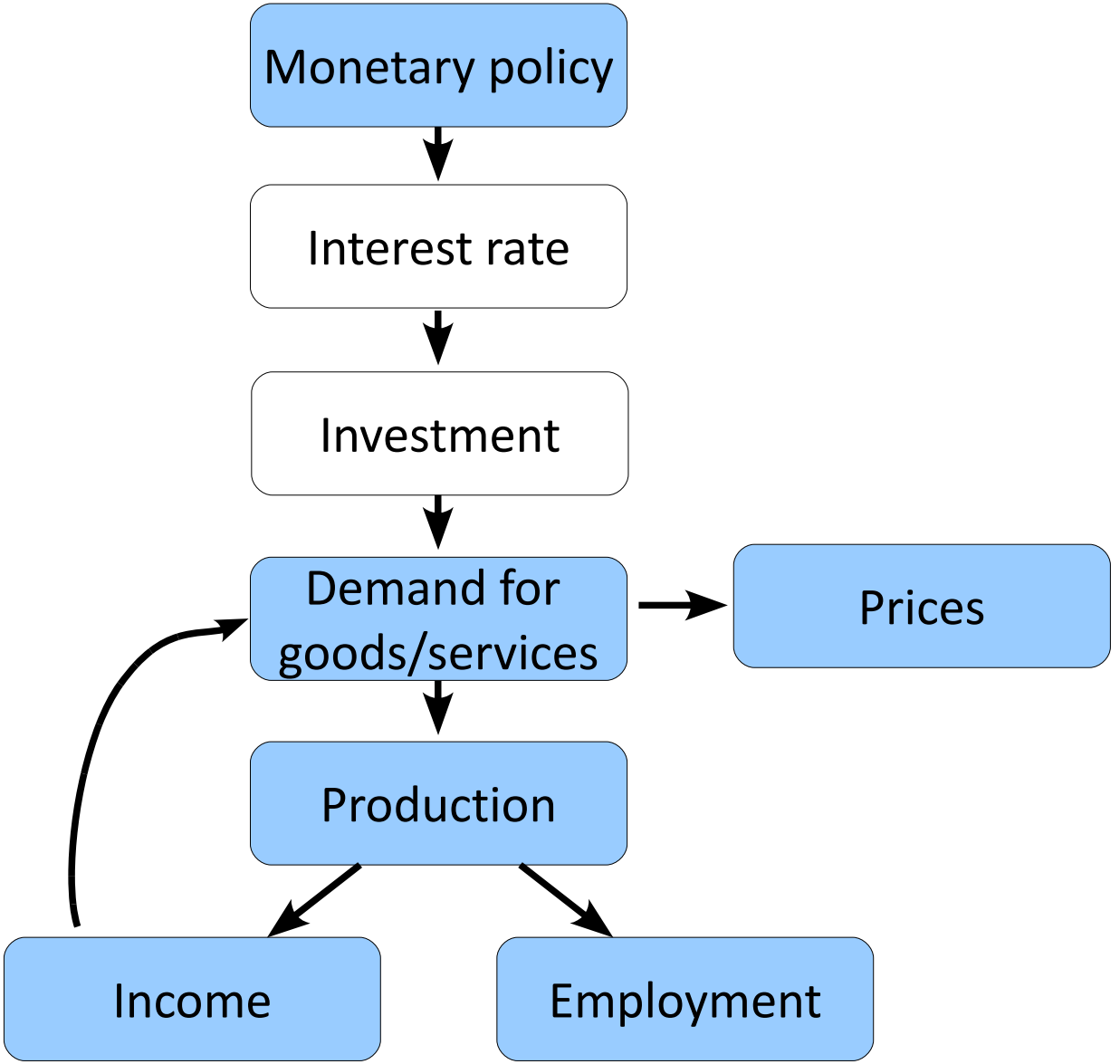


The bank's reserves exceed the legal requirement.



The bank lends excess reserves to earn interests, thus starting the process of deposit creation.

Monetary Policy Transmission

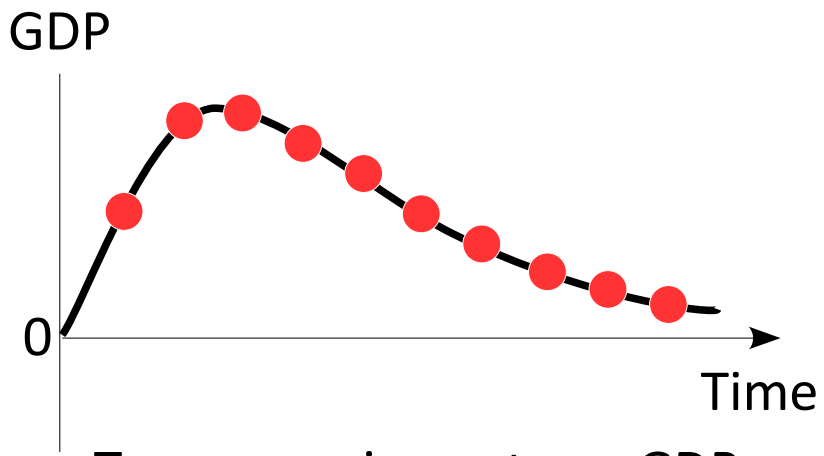


Consensus on the Effects of Money

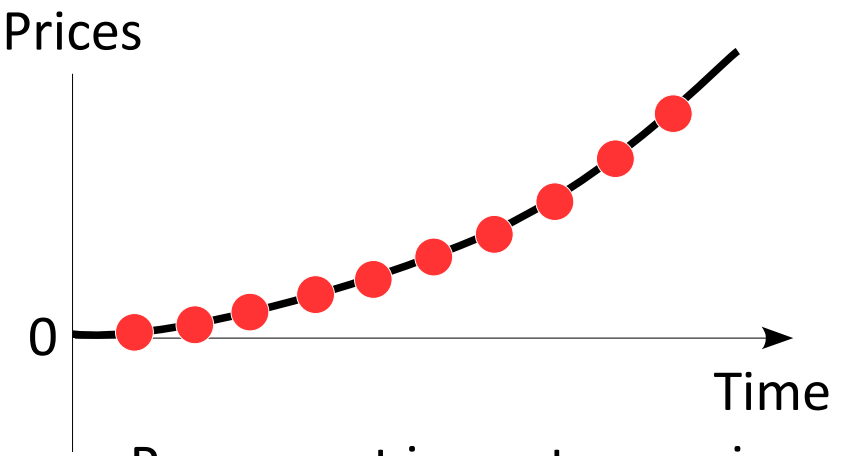
In the short run, money affects the level of economic activity: GDP and (un)employment.

In the long run, money affects prices alone.

Suppose that the central bank has accelerated money growth.



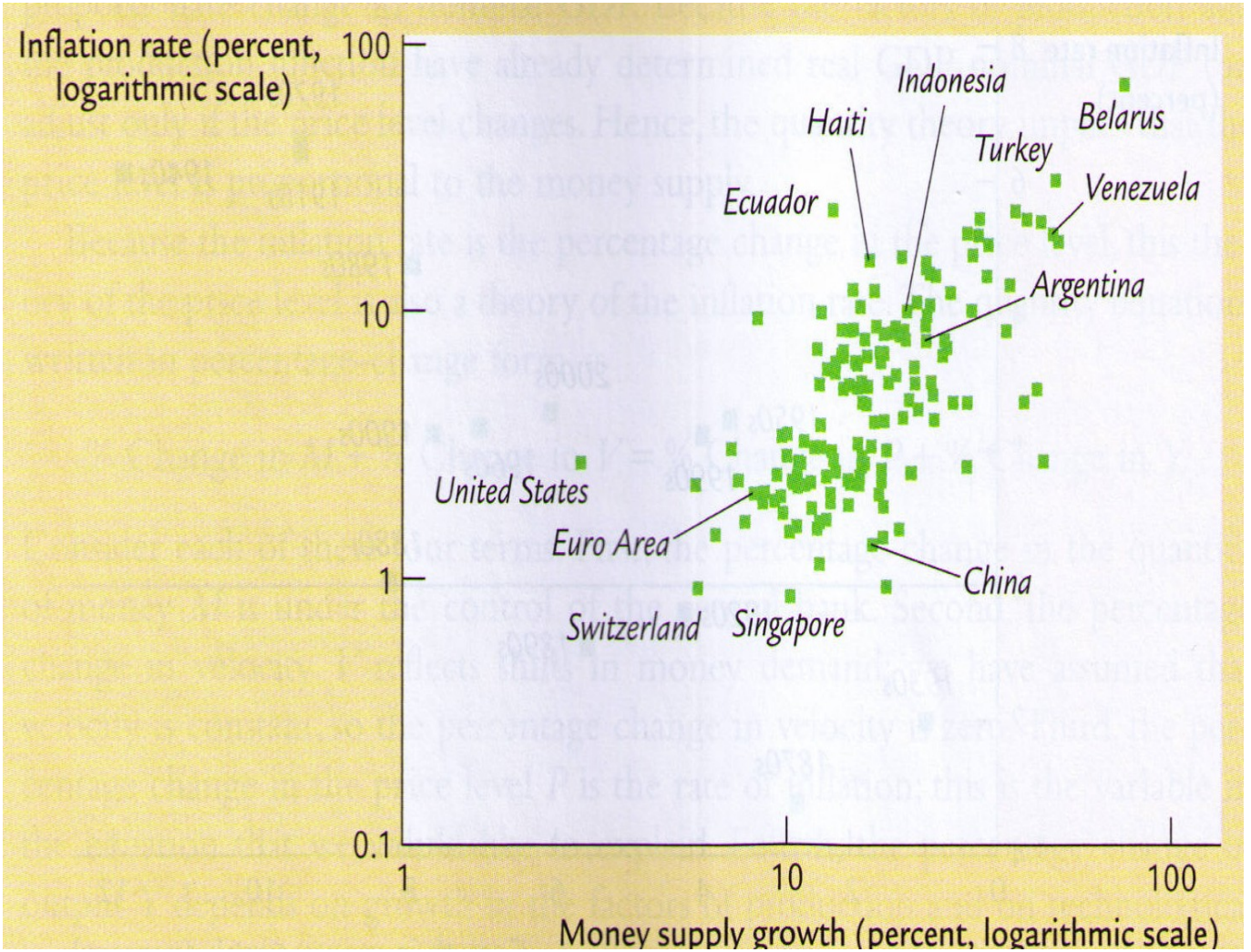
Temporary impacts on GDP



Permanent impacts on prices

Price stability is the primary goal of central bank.

Persistent rises in price level have always been backed by high rates of money growth.



Mankiw(2009), Macroeconomics, p.92.

What makes central bank accelerate the money growth?

→ **Government budget deficits**

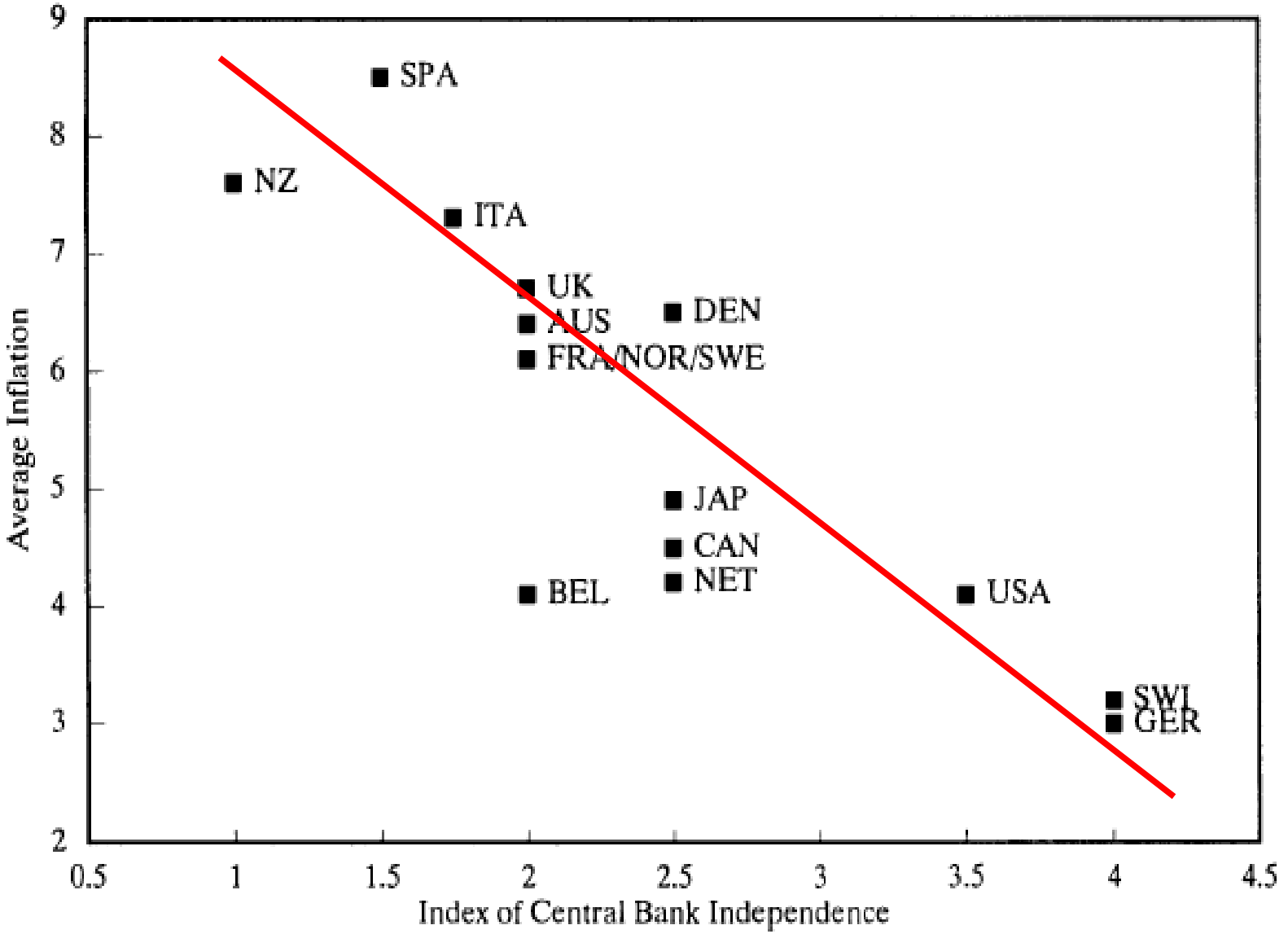
Independence of Central Bank

Government deficits could be financed by borrowings from the public (=purchase of government bonds).

Large and persistent deficits could *not* be financed by the public, who suspect the future repayment by the government.

All the government could do is make the central bank print money to finance its deficit.

In some countries, law requires the central bank to be independent of the government, in order to guard the central bank against the government intervention.



Alesina, Alberto, and Summers, Lawrence,
"Central Bank Independence and Macroeconomic Performance: Some Comparative Evidence," *Journal of Money, Credit, and Banking,* Vol.25, No.2 (1993).

Final Exam

Final exam will be held at 15:10-16:10 on July 19
in the same lecture room.

All the topics discussed through the course could be covered.

Non-native students in English are allowed to use English-Japanese/ Korean dictionaries.

The students' grades are open about a week after the exam.
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http://www1.meijigakuin.ac.jp/~iwamura/