

Fiscal & Financial System in Japan A

2010 Spring

Session 7

Determination of Interest Rates (2),

Movements in Interest Rates

June 7, 2010

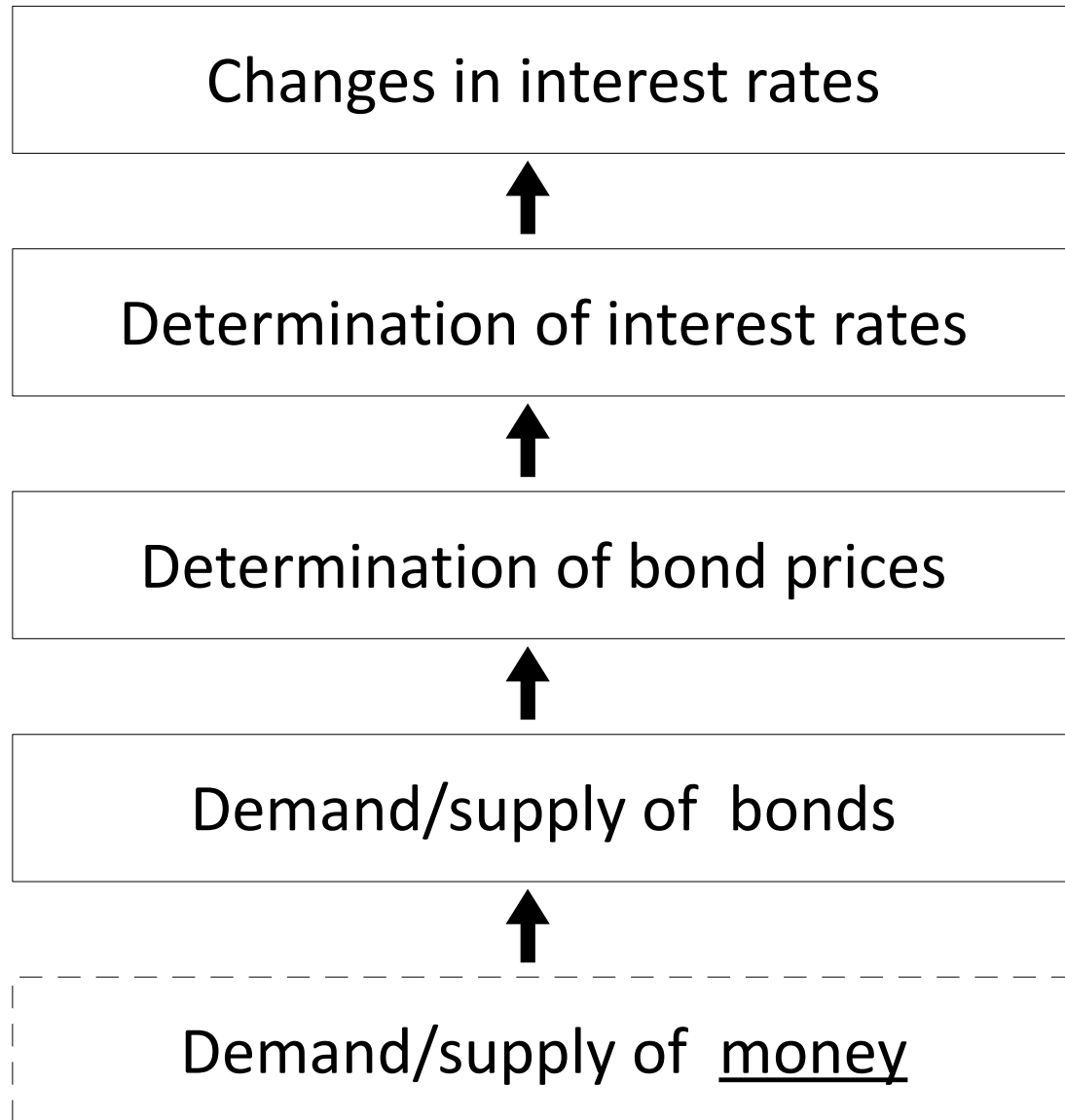
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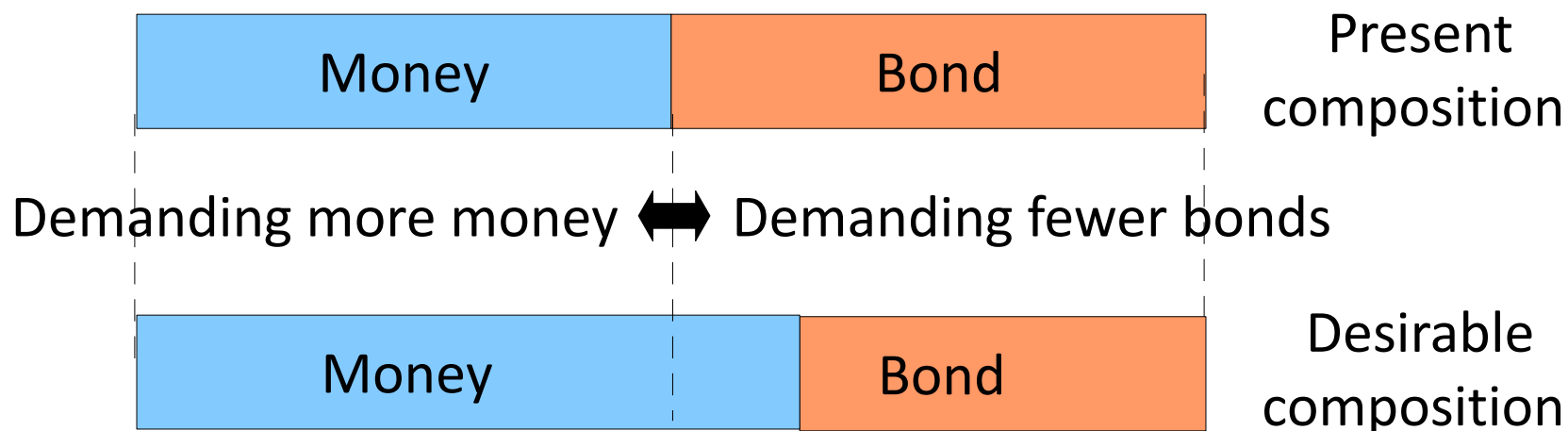
Faculty of International Studies

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Review



When you want to have more money, all you can immediately do is to sell your bonds and receive money.



Demand for bonds negatively correlates with demand for money.

We can examine the bond price determination indirectly by focusing on demand/supply of money, instead of directly looking at demand/supply of bonds.

What affects demand for money?

Cost of Holding Money

Increasing money means decreasing bonds.
(Increasing bonds means decreasing money.)

Holding money means selling bonds of equal value,
thus giving up interest payments from those bonds.

Costs of holding money

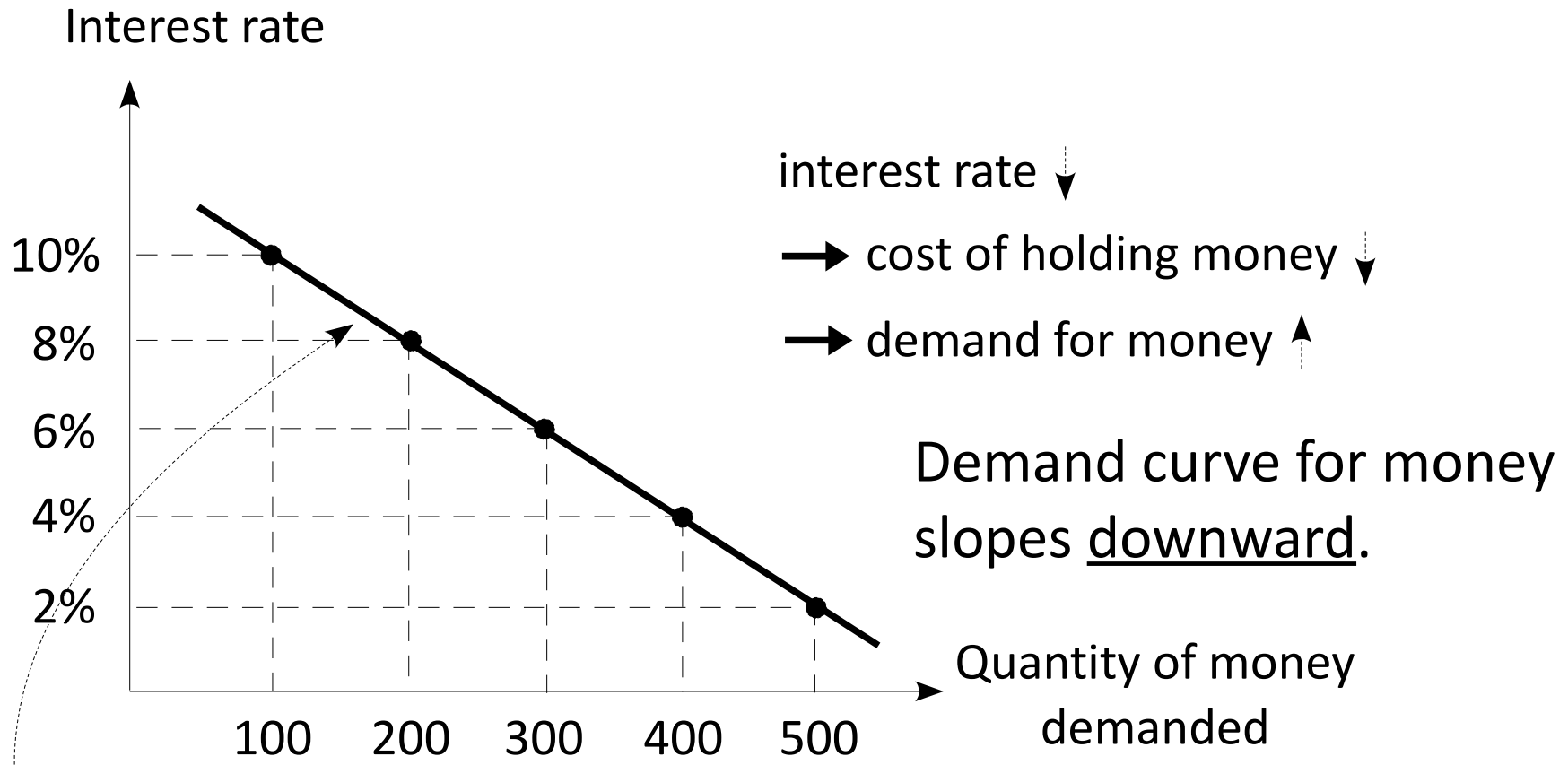
Interest rates are high (low)

→ Costs of holding money are large (small)

→ Demands for money are small (large)

Demands for money negatively depend on the interest rates of bonds.

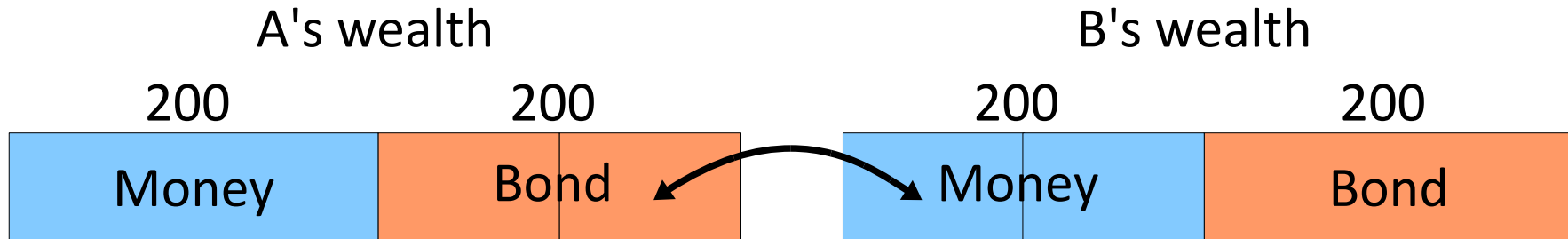
Demand for Money



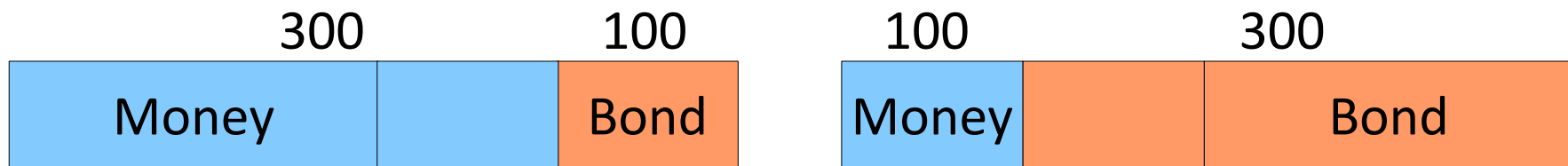
DEMAND CURVE:

The quantity of money people desire to hold at each level of interest rate

Supply of Money



A wants to have more money, and B wants to have more bonds.
B buys bonds from A, and A receives money from B.

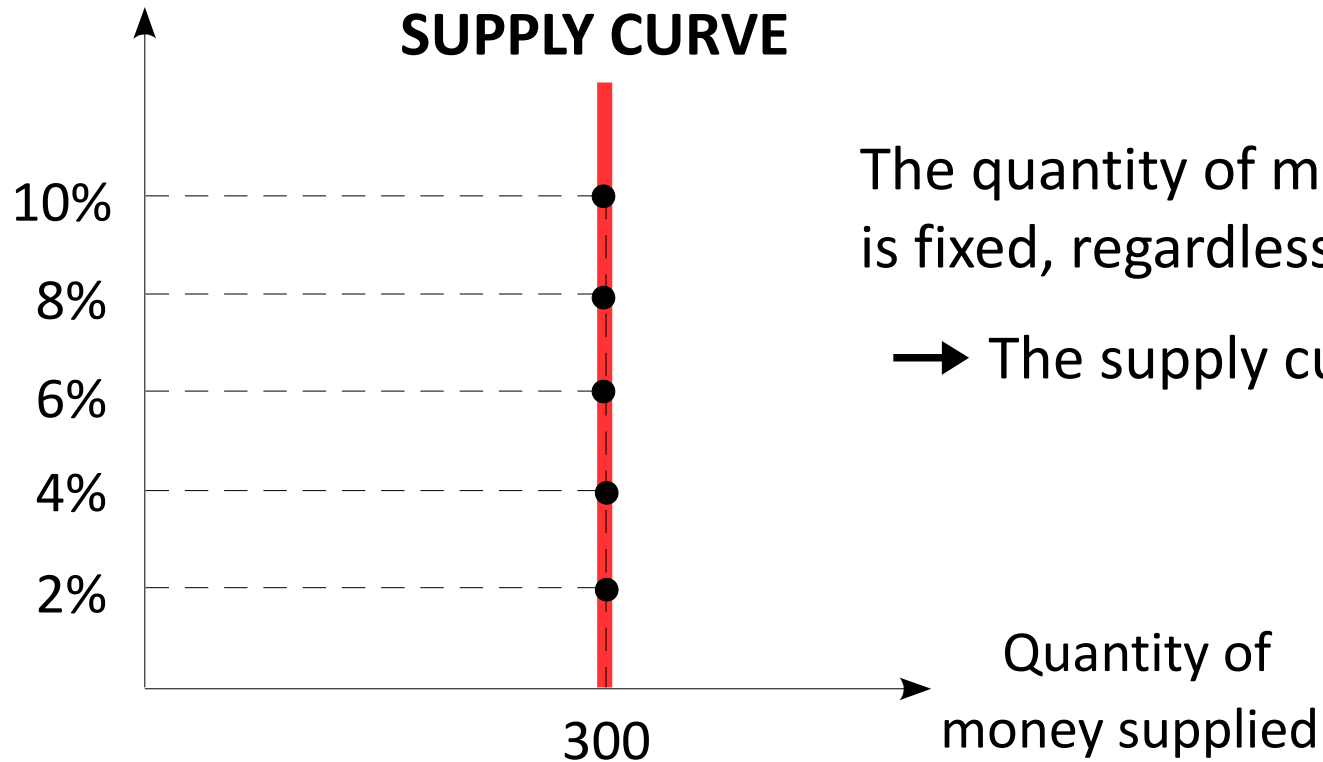


The allocation of money/bonds between A and B could vary,
but the total amount of money/bonds stays unchanged.

Supply of money and bonds is fixed.

Supply of Money

Interest rate



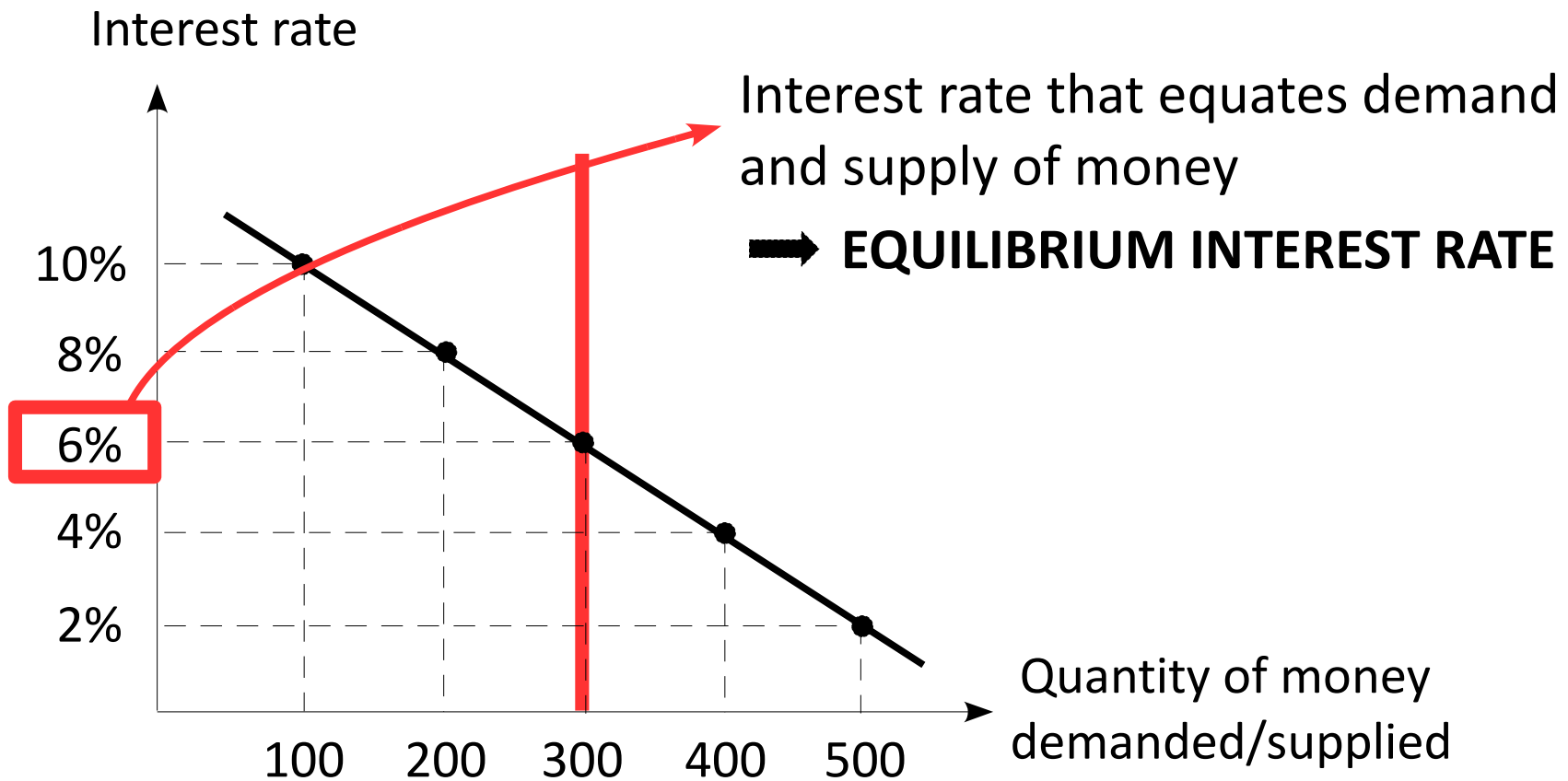
The quantity of money that we can hold is fixed, regardless of interest rates.

→ The supply curve is vertical.

Supply of money is controlled by the central bank, which bases its action on policy consideration, and hence is never affected by interest rates.

Interest Rate Determination

“Equilibrium Interest Rate”

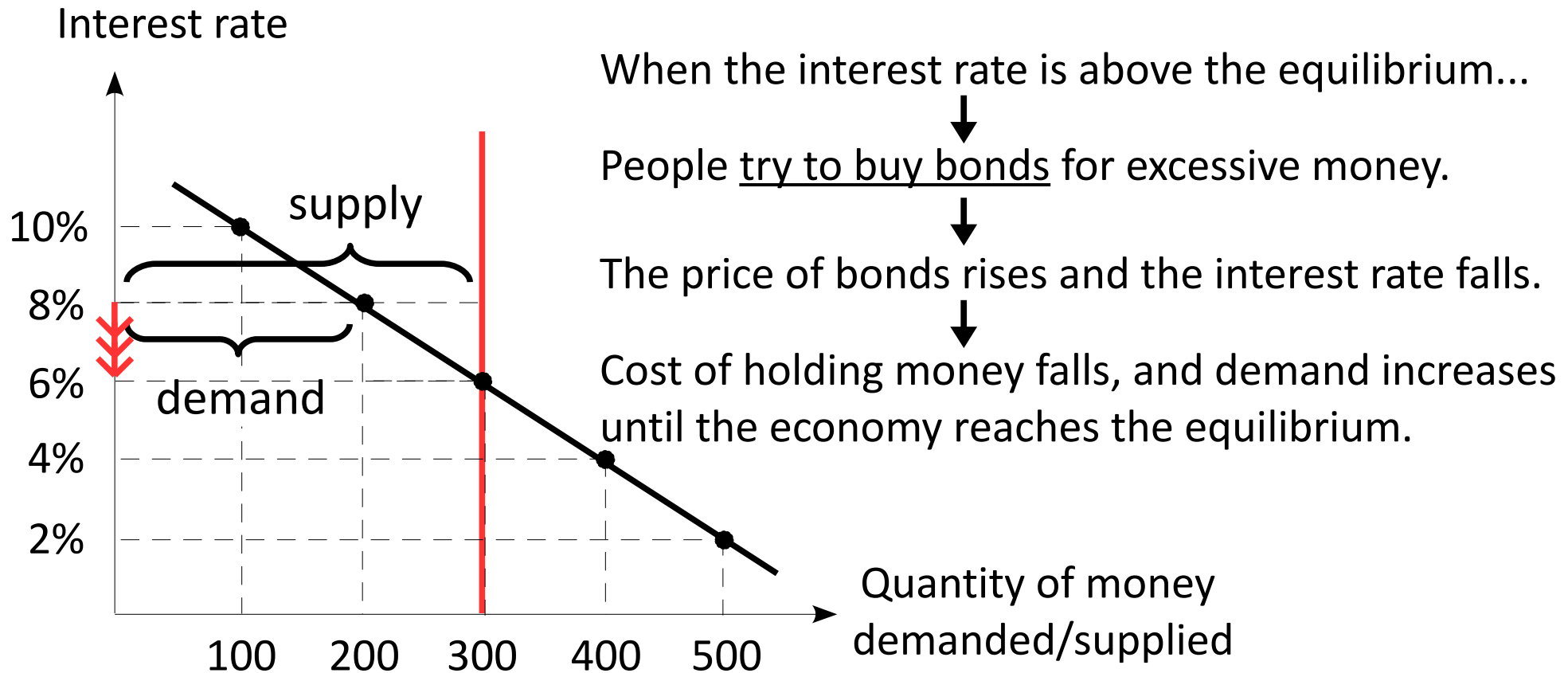


Economic theory says that interest rate is “determined” at the equilibrium level.

Why the equilibrium?

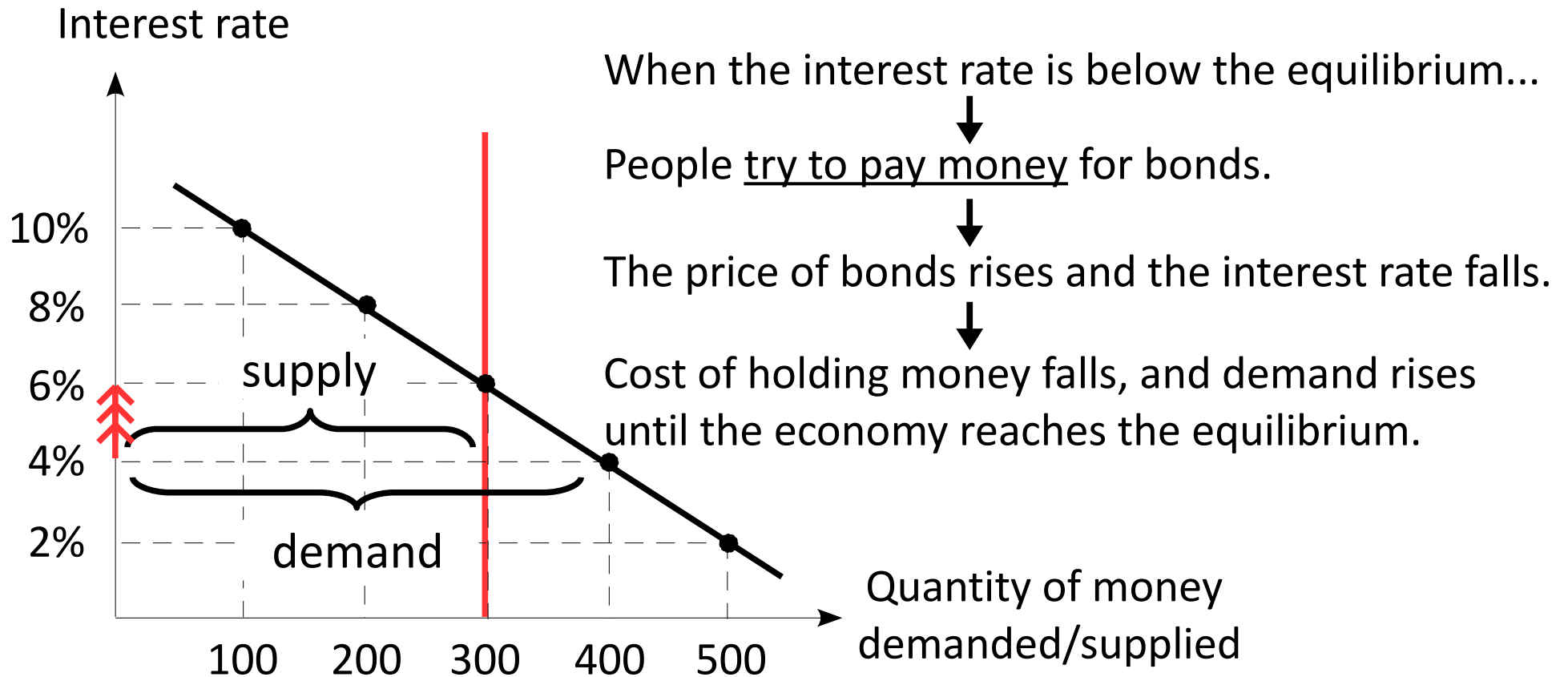
What does “determine” mean?

What happens off the Equilibrium?



The interest rate automatically starts to move to the equilibrium level.

What Happens off the Equilibrium?



Again, the interest rate automatically starts to move to the equilibrium.

Why Focus on Equilibrium?

- (1) Because, at any other level of interest rate, people hold more/less money than they want, they try to sell/buy bonds and the market automatically starts to move toward the equilibrium.
- (2) Once the market reaches the equilibrium, people hold the quantity of money that they want, and there is no motive to sell or buy bonds. The bond price, and thus interest rate, stays unchanged.

Markets “justify” the equilibrium interest rate alone.

We should pay attention to the equilibrium interest rate.

5. Movements in Interest Rates (Mishkin Ch.5)

Behavior of Interest Rates

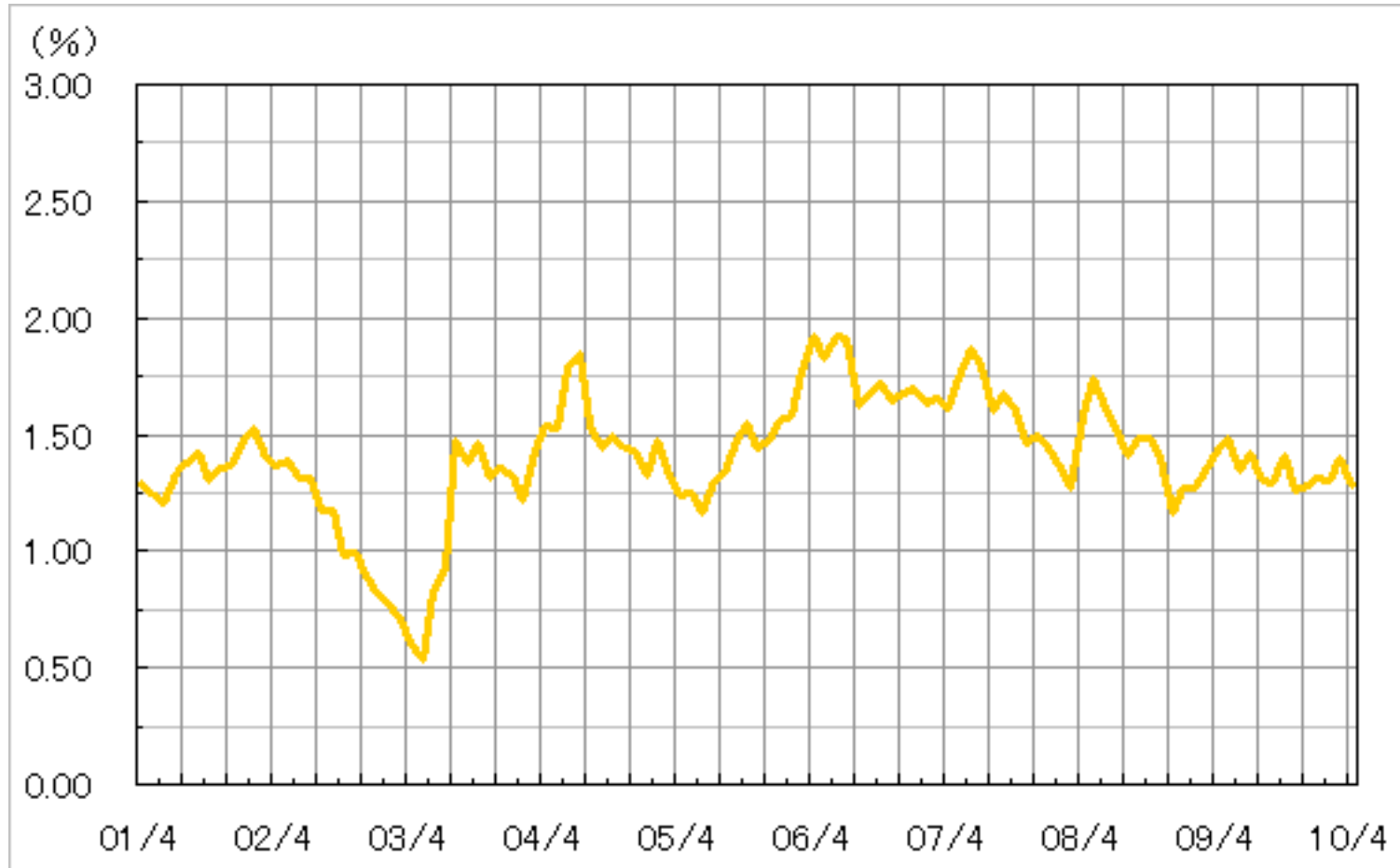


Figure: Long-term JGB yield (10-year newly issued bond)

Source: Japan Bond Trading Co., Ltd.

http://www.bb.jbts.co.jp/data/index_kinri.html

Changes in Interest Rates

Changes in interest rates we observe everyday are ...

NOT the process toward the equilibrium

BUT the changes in equilibrium itself

1. Does the equilibrium interest rate need to change SO FREQUENTLY?

The environment surrounding us changes every minute, thus affecting desirable composition of our wealth, therefore our demand for money.

The (equilibrium) interest rate is always pressured to change.

2. Do interest rates change SO QUICKLY?

Because we have already accumulated so large an amount of bonds, there will immediately be so large an amount of bond sales/purchases, which rapidly affects the price, and thus the interest rate.

The market “jumps” to the new equilibrium.

The market is always at the equilibrium, and there is hardly no “interim period” where interest rates are off the equilibrium.

Changes in Equilibrium

What causes the equilibrium to change?

Shifts in demand and supply curves

What causes demand and supply curves to shift?

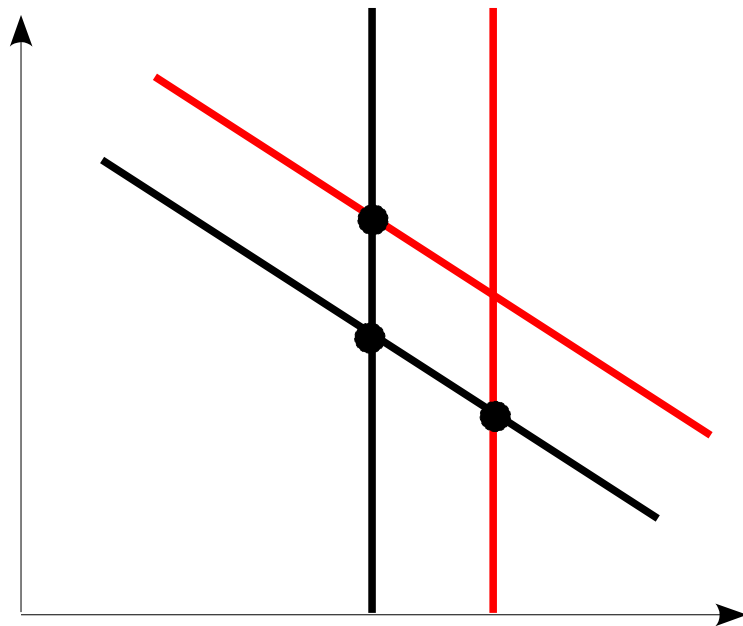
(1) Shifts in demand curve

a. Changes in income

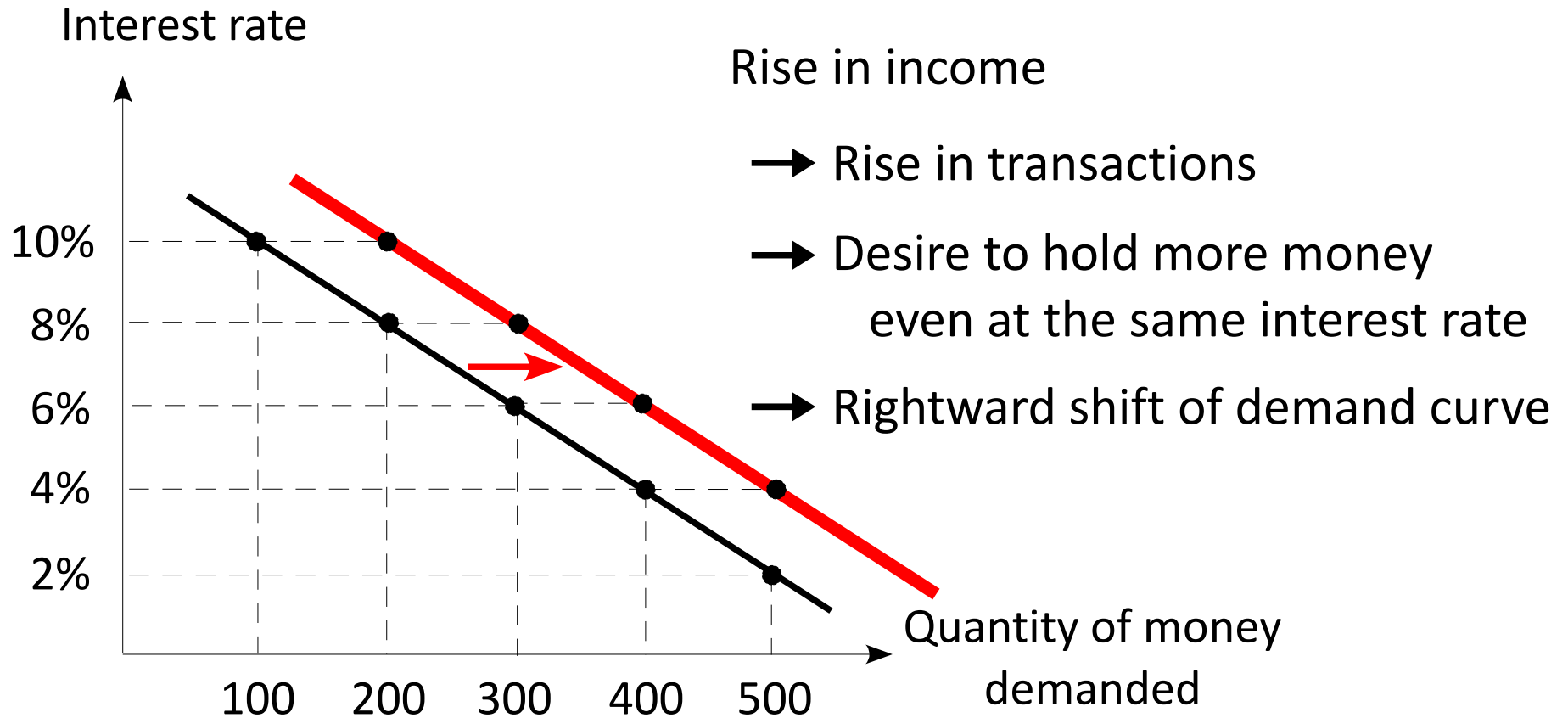
b. Changes in price level

(2) Shifts in supply curve

Changes in money supply

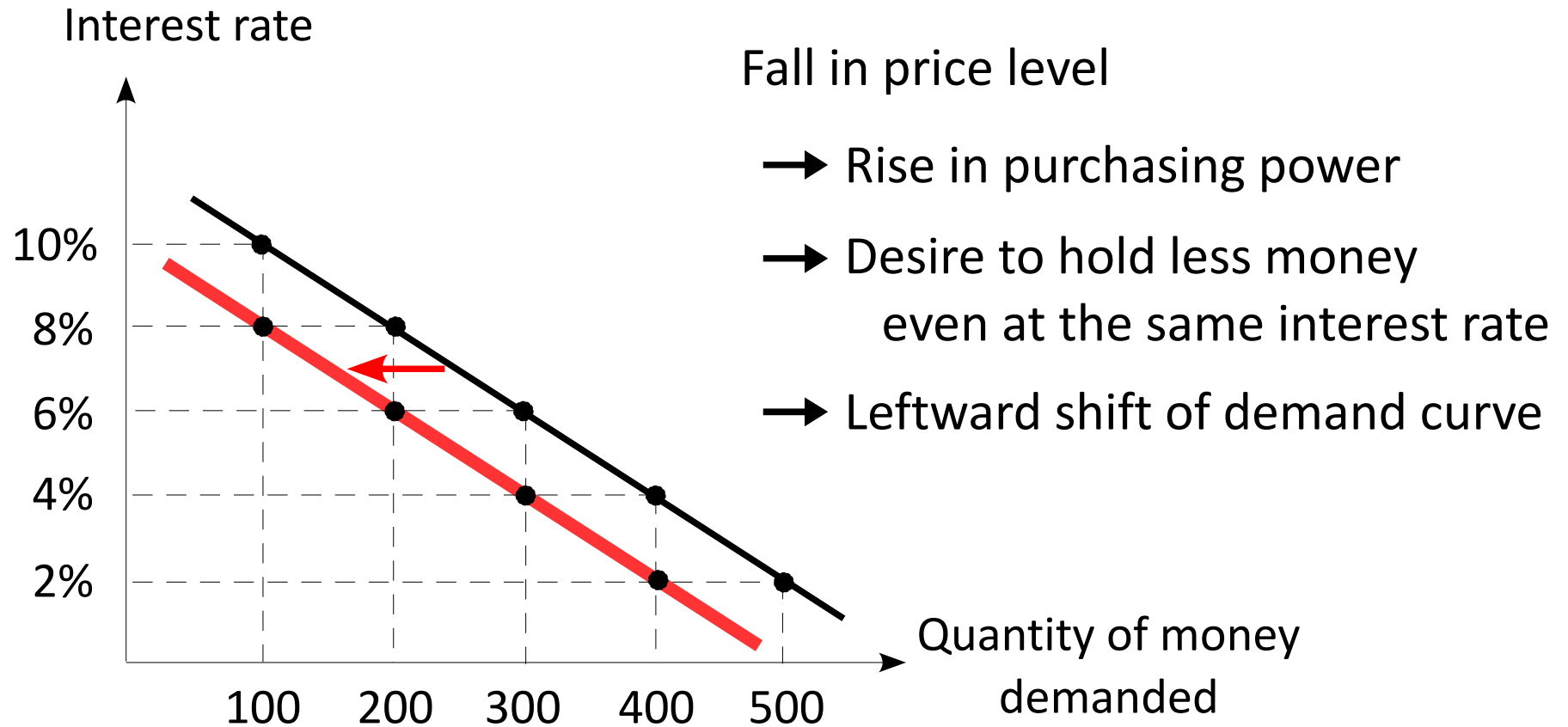


Changes in Income



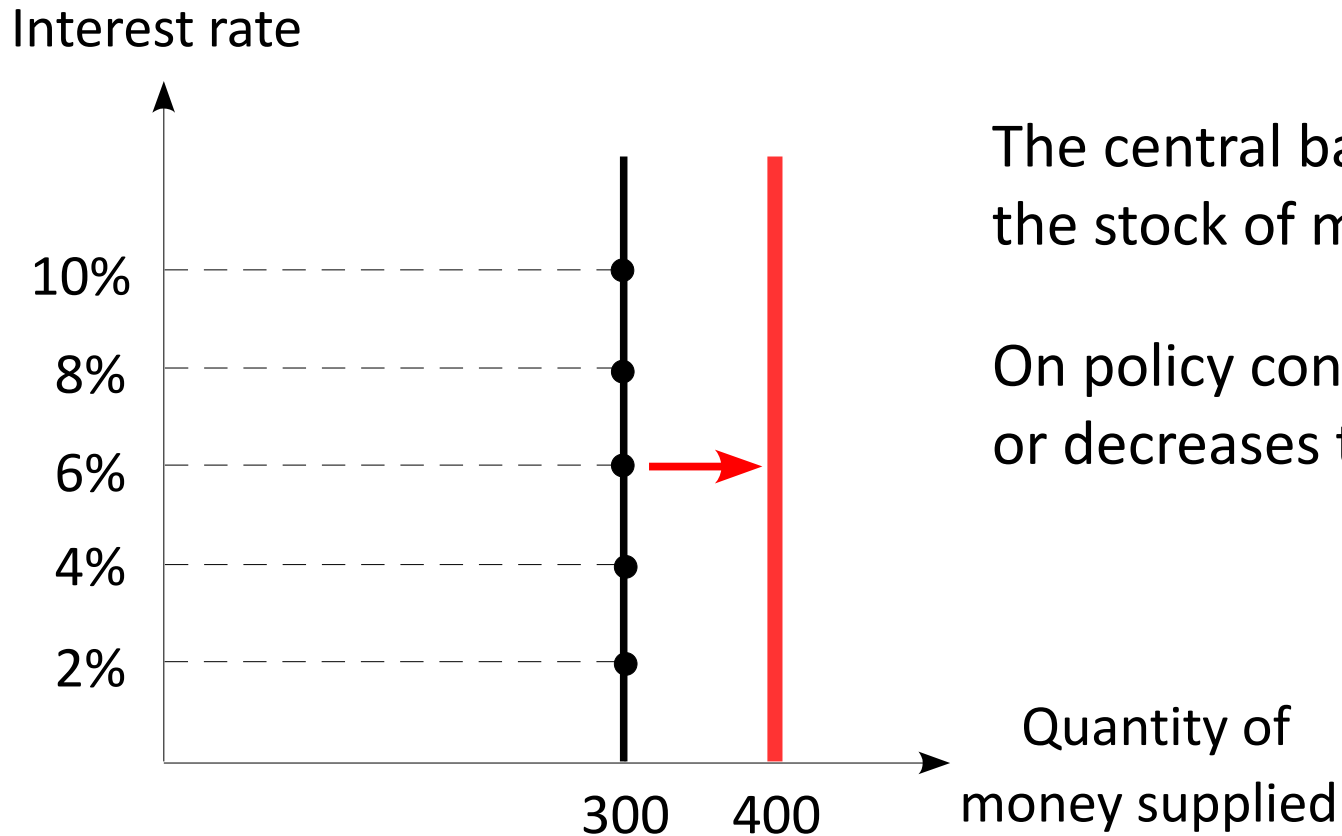
Rises in income shift money demand curve to the right.
Falls in income shift money demand curve to the left.

Changes in Price Level



Rises in price level shift money demand curve to the right.
Falls in price level shift money demand curve to the left.

Changes in Money Supply



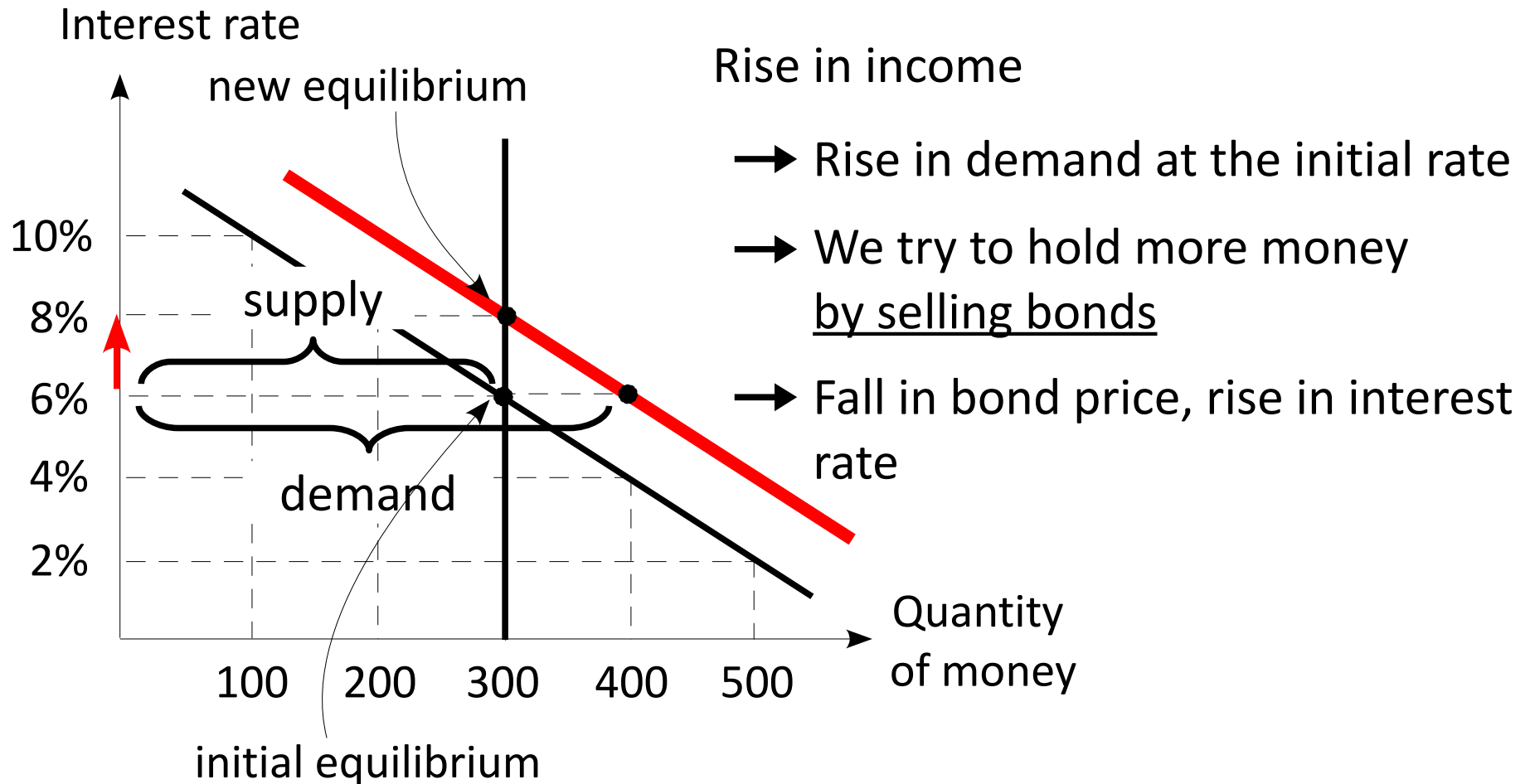
The central bank controls the stock of money in the economy.

On policy consideration, it increases or decreases the money stock.

Increases in money supply shift the supply curve to the right.

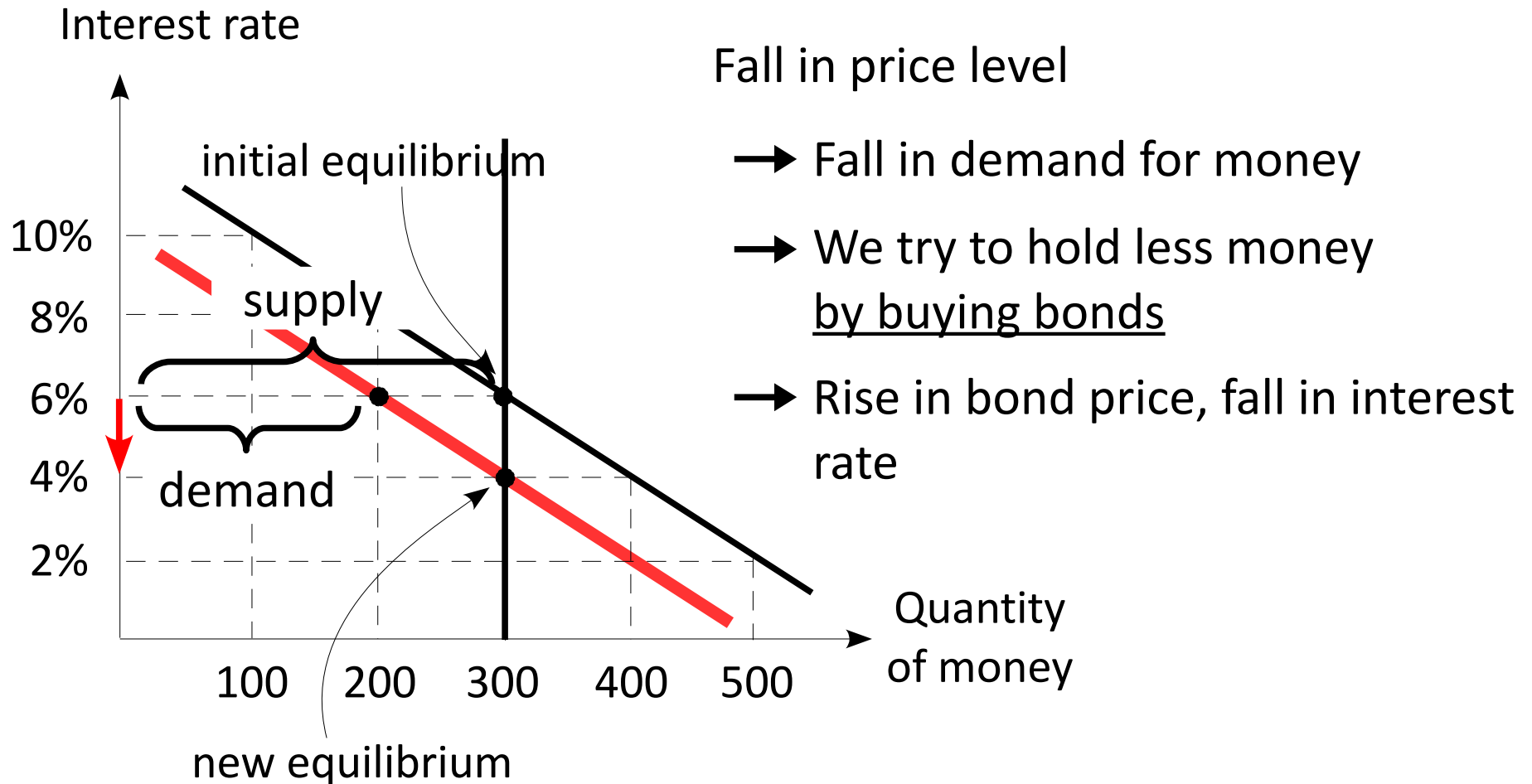
Reductions in money supply shift the supply curve to the left.

Income Effects on Interest Rates



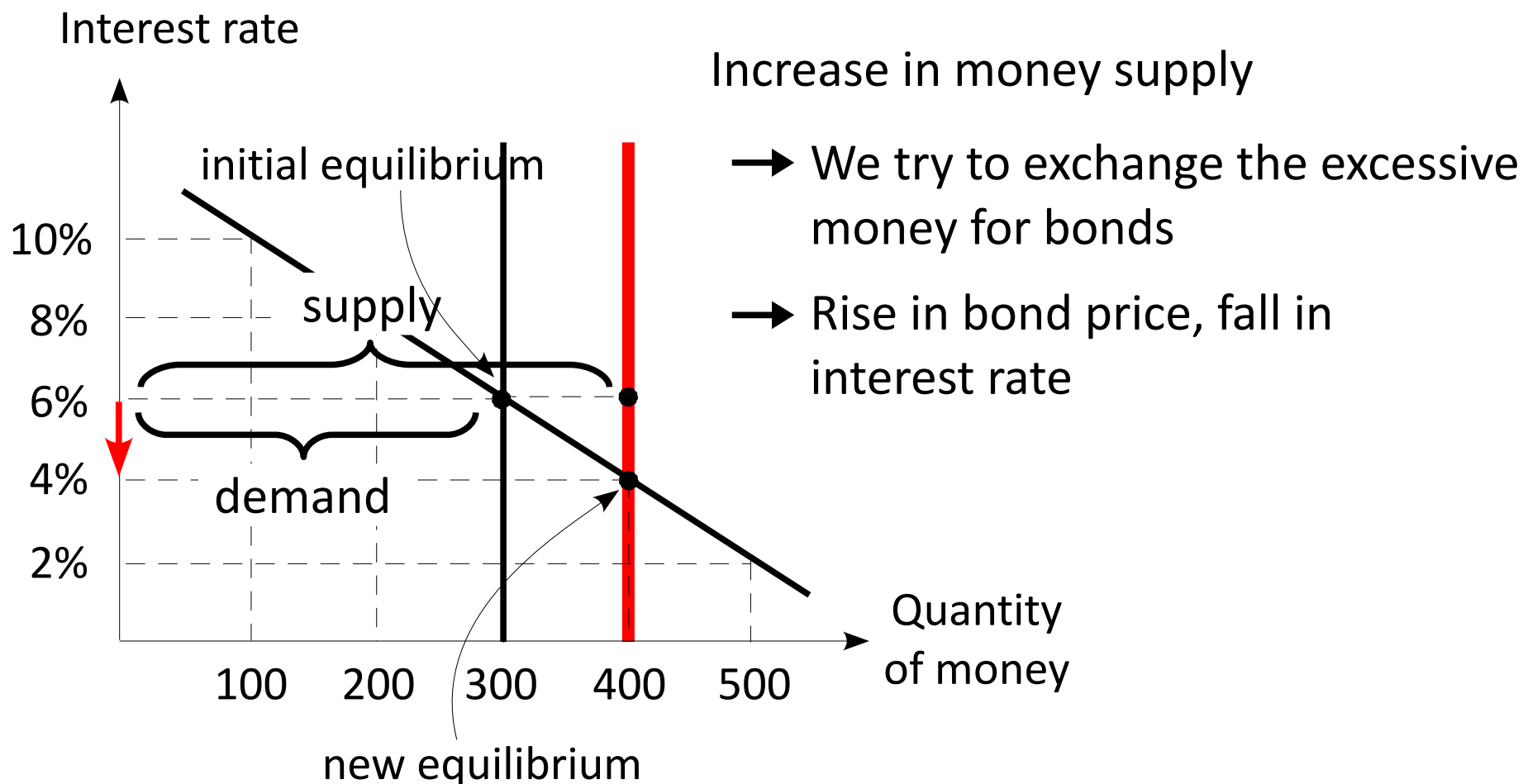
Rises(falls) in income drive the (equilibrium) interest rate up(down).

Price Level Effects



Rises(falls) in price level drive the (equilibrium) interest rate up(down).

Money Supply Effects



Rises(falls) in money supply drive the interest rate down(up).

Conclusion

The (equilibrium) interest rates change as the levels of income, prices, or money stock changes.

Income \uparrow (\downarrow)	(Equilibrium) Interest rate \uparrow (\downarrow)
Prices \uparrow (\downarrow)	(Equilibrium) Interest rate \uparrow (\downarrow)
Money supply \uparrow (\downarrow)	(Equilibrium) Interest rate \downarrow (\uparrow)

Appendix: Walras' Law

We have been focusing on how money market finds its equilibrium.

But how about bond market?

Should we focus also on bond market?

No, by Walras' Law.

(* Leon Walras ... A French economist in the 19th century)

B_S Outstanding stock of bonds
= Supply of bonds

B_D Desirable quantity of bond
holding = Demand for bonds

M_S Outstanding stock of money
= Supply of money

M_D Desirable quantity of money
holding = Demand for money

“Demand must be equal to wealth.”

$$B_S + M_S = B_D + M_D \rightarrow$$

Simply a budget constraint,
which must always be satisfied.

Rearranging and collecting terms...

$$(M_S - M_D) + (B_S - B_D) = 0$$

implying

$$\begin{cases} M_S - M_D < 0 & \leftrightarrow & B_S - B_D > 0 \\ M_S - M_D > 0 & \leftrightarrow & B_S - B_D < 0 \\ M_S - M_D = 0 & \leftrightarrow & B_S - B_D = 0 \end{cases}$$

When money market is in equilibrium,
bond market is also in equilibrium.

We can focus only on money market.

Mid-term Exam

Place: Lecture Room #822

Time: 15: 10 - 16:10

You will be mainly asked to “explain” some concepts in finance.

You will also be asked to derive some relationships among economic variables.

Example: “Explain how prices and interest rates of bond are related and why.”

You can be asked to perform simple calculations.

Make your letters easy to recognize.