The Money Market

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The Money Market

- Where the demand and supply for money “meet”
- Where the price of money is determined

- What is money?
- What determines the demand for money?
- What determines the supply of money?
- What is the price determined on this market?

What is Money?

- Money is defined by its functions
  - A medium of exchange
  - A store of value
  - A unit of account

- Not all commodities can be used as money
  - Cigarettes… okay
  - Ice cream… not okay
  - Fiat money… okay: it is designed to serve as money

Stock and Flows

- The supply and demand for money are about stocks
    - Demand: How many dollars to have in one's pocket or checking account?
    - Supply: How many dollars should there be in the economy?
- Stock ≠ Flows
    - Flow of transactions in a year financed with existing stock of dollars ⇨ same dollar can be used multiple times

The Demand for Money

- Money is useful for transactions
  - More transactions ⇨ more money needed
  - High prices ⇨ more money needed

- Money does not pay interests and loses value with inflation ⇨ there is a cost to holding money

- Interest rate determines the opportunity cost of holding money
  - High interest rate ⇨ people demand small quantities of money

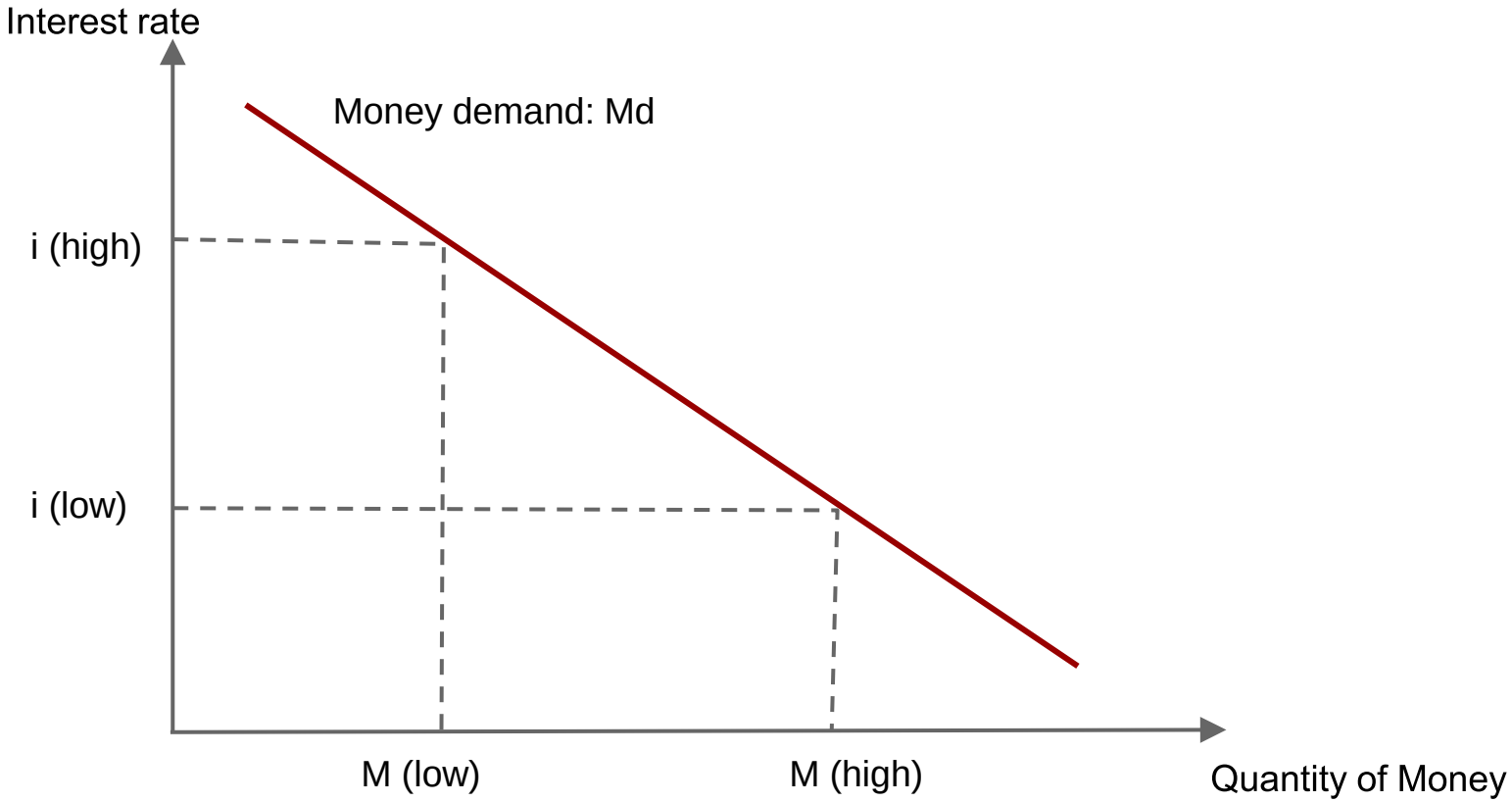
Which Interest Rate is Relevant?

- There are lots of interest rates
  - Overnight, 1 month, 3 months,... 30 years, etc

- A crude distinction: short term versus long term rates

- The short term rate is the opportunity cost of money
  - Money can be used immediately for buying stuff
  - Next best alternative: have money “tomorrow” to buy stuff, but invest overnight
  - So the overnight rate is the opportunity cost of money

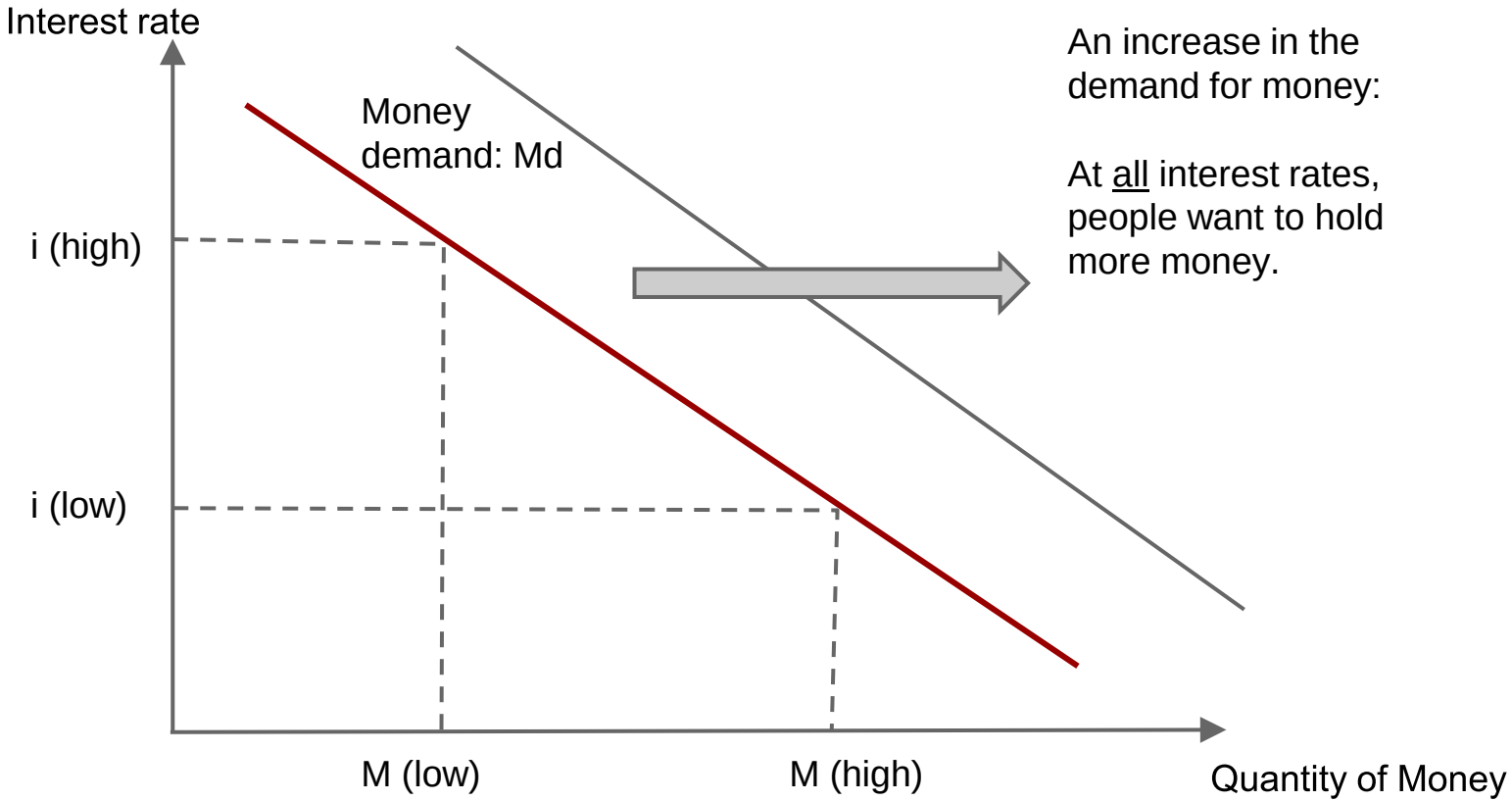
The Demand for Money



The Demand for Money

- Need to distinguish movements along the demand curve and shifts of the demand curve
- When the interest rate changes the quantity demanded changes: a movement along the demand curve
- When people want to hold more money at all interest rates, the demand curve shifts

The Demand for Money



An increase in the demand for money:

At all interest rates, people want to hold more money.

Shifts in the Demand for Money

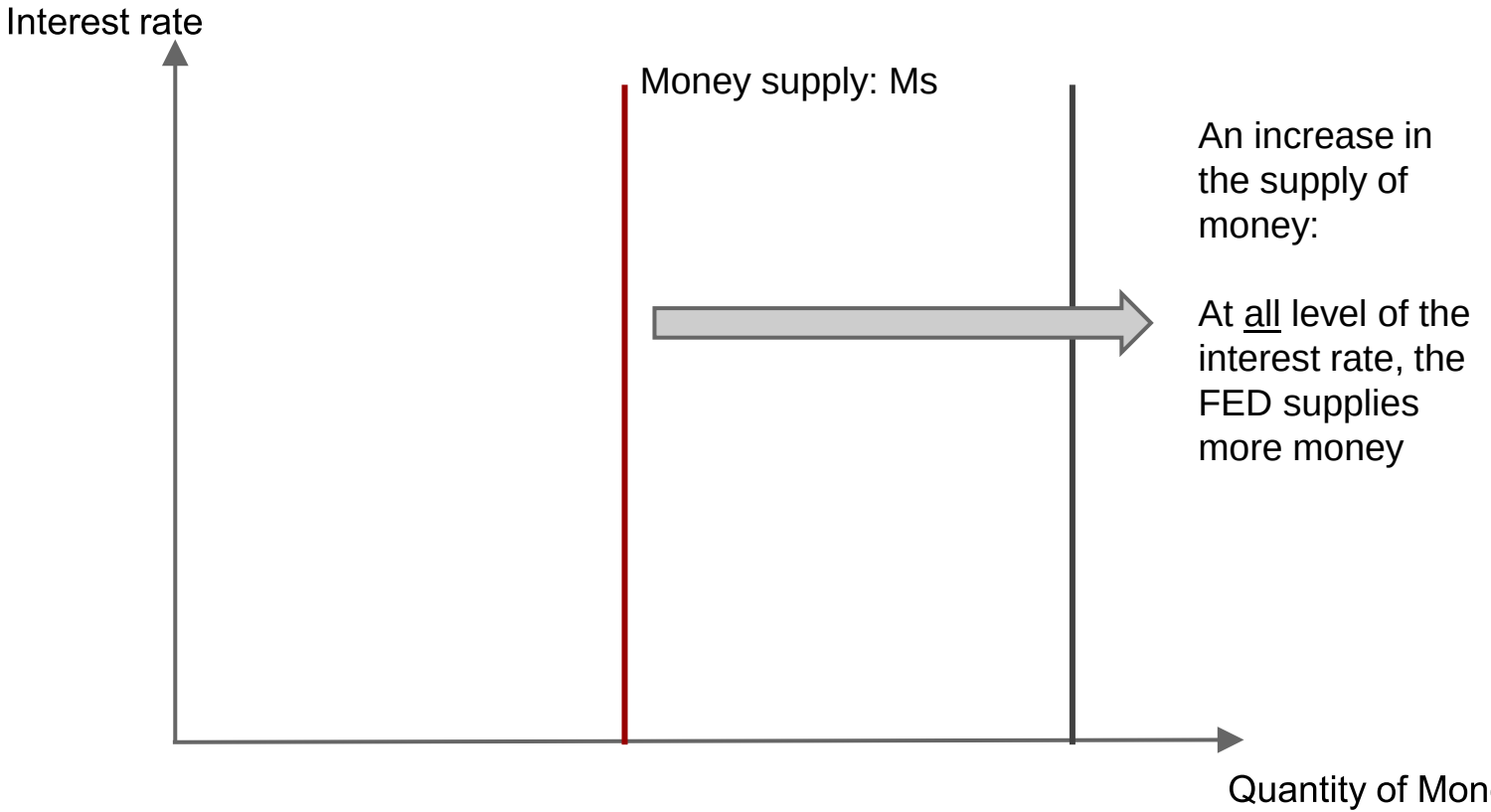
- When the price of goods increases the demand for money is higher
- When GDP increases the demand for money is higher
- Technology: ATM allow people to hold less money at any point in time
- Regulation: when checking accounts are allowed to pay interest, the demand for money is higher

The Supply of Money

- Determined by the central bank
  - The Federal Reserve Bank in the U.S.
  - The Bank of Japan in… Japan
  - etc…

- The supply of money is determined by the Monetary Policy
  - The FED's mandate is to maintain "price stability," "maximum employment," and "moderate rates of interest"

The Supply of Money

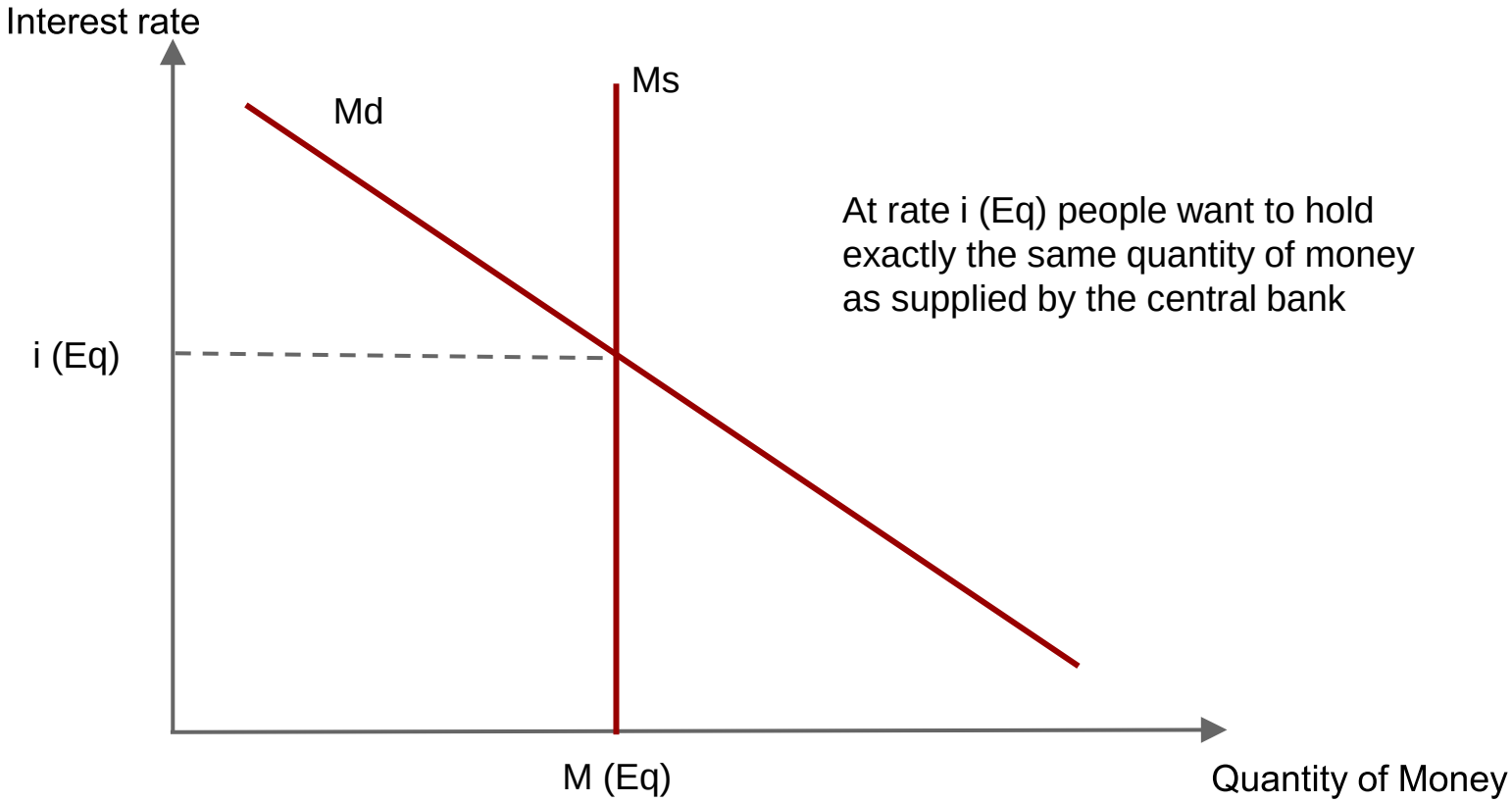


Equilibrium of the Money Market

- What is an equilibrium?

- It is a combination of a short term rate and a quantity (i,M) such that:
  - At this price the supply and the demand are equal

Equilibrium of the Money Market



At rate i (Eq) people want to hold exactly the same quantity of money as supplied by the central bank

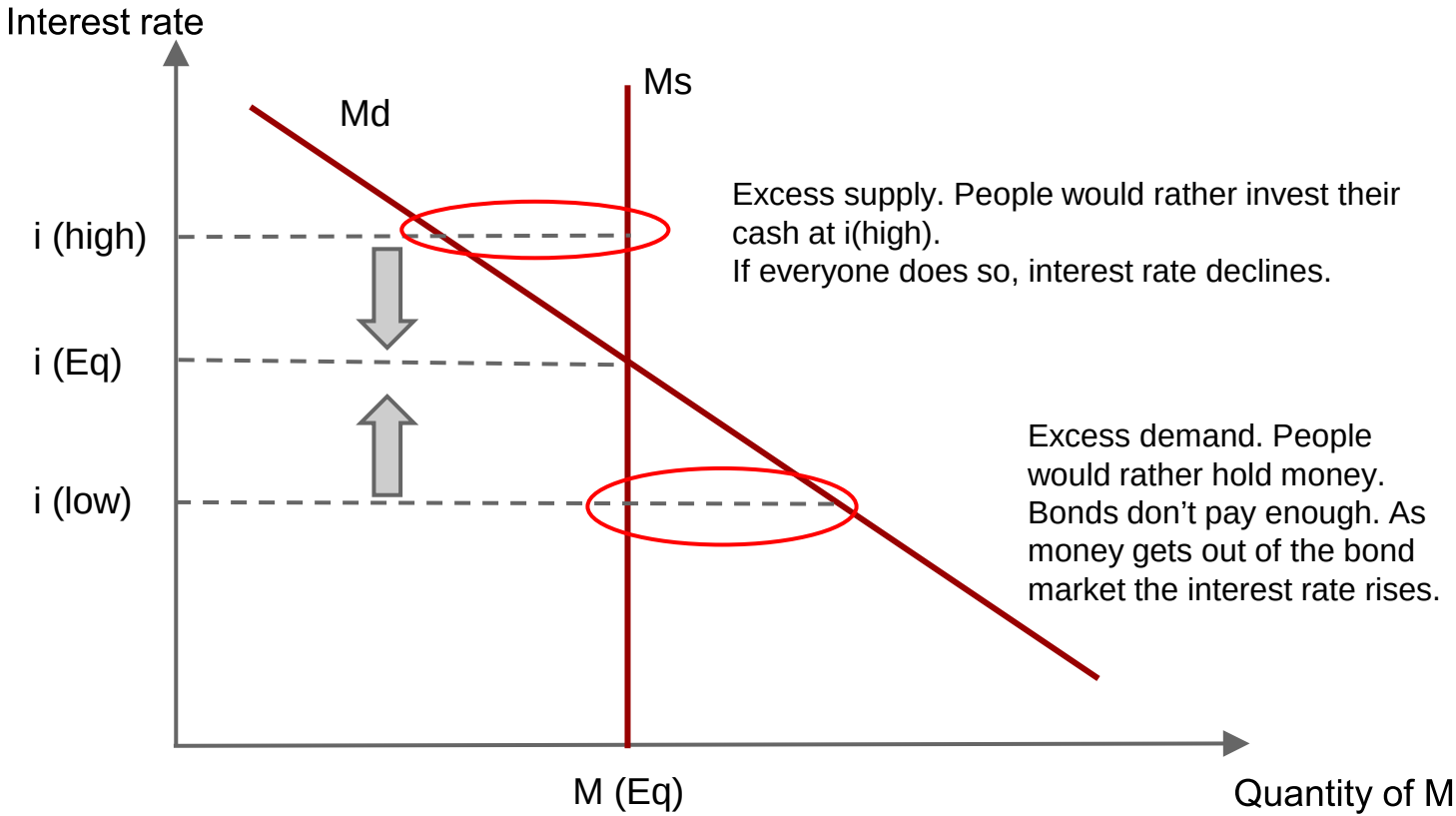
Equilibrium of the Money Market

- Why use the notion of equilibrium?

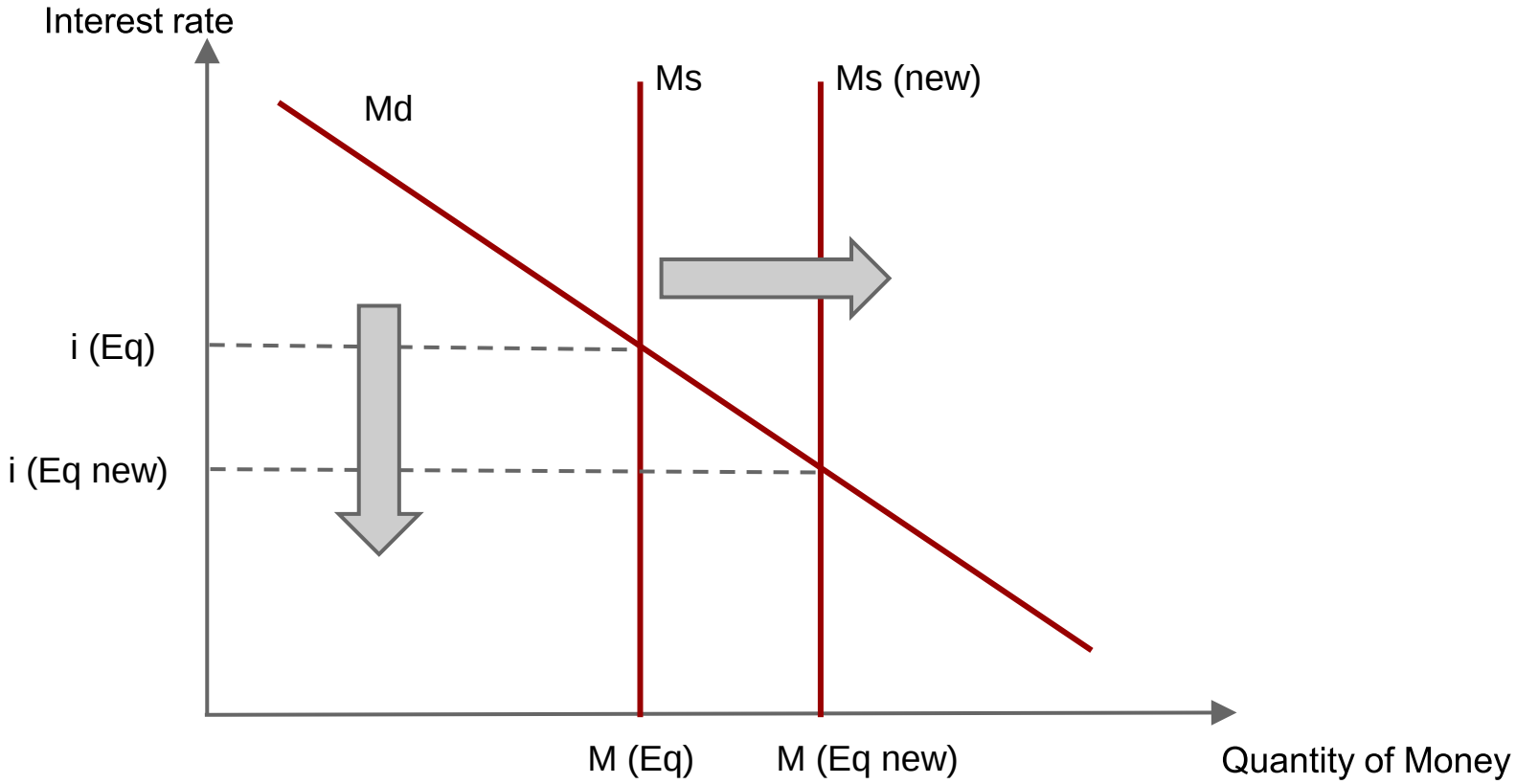
- Is it a “good” “description” of the world?
  - Not a well posed and/or useful question
  - Models are like maps…
    - useful ONLY when the scale is NOT 1.

- Stability of equilibrium makes the concept useful
  - It is a theory of the rate around which the market fluctuates

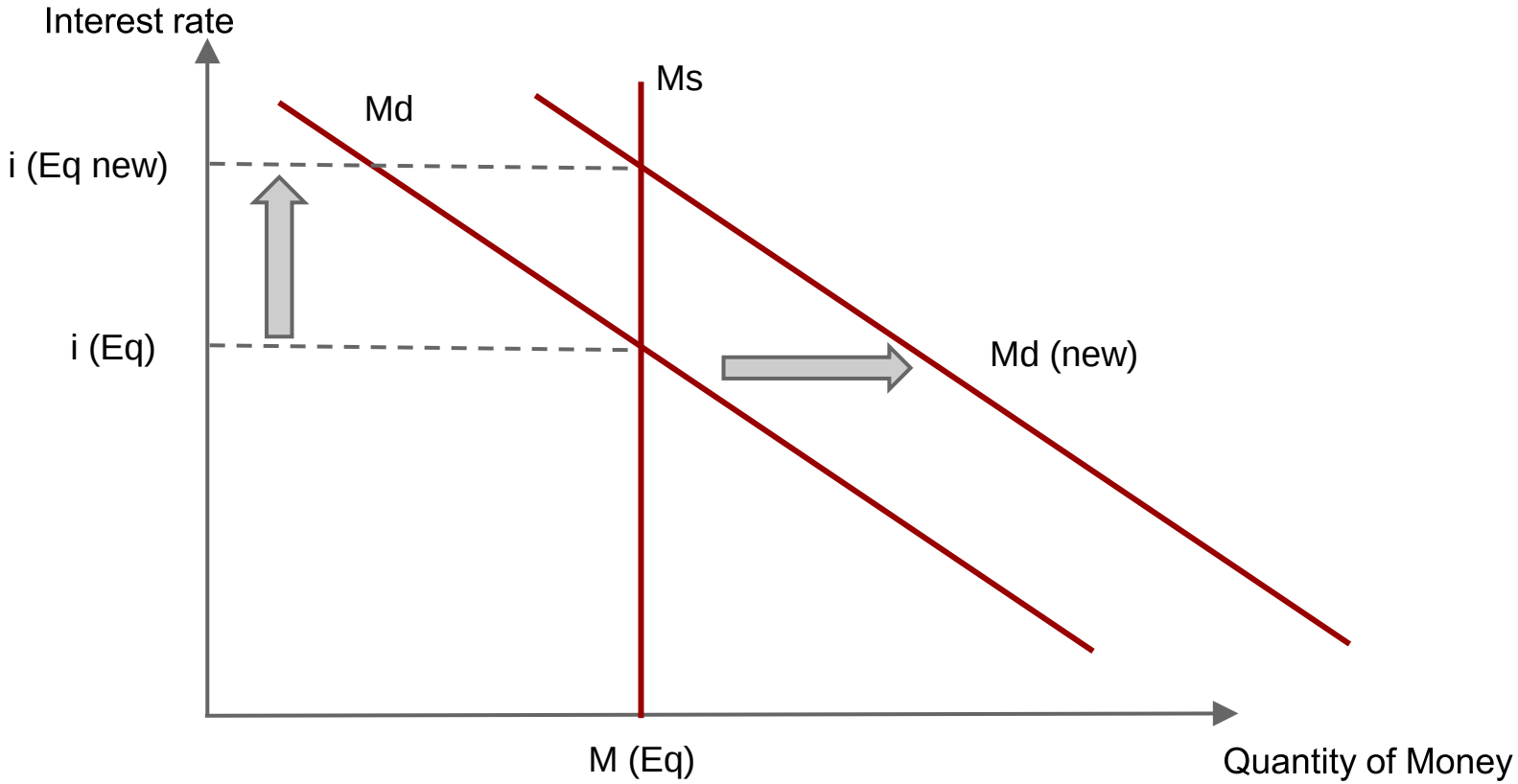
Stability of Equilibrium



Increase in the Supply of Money



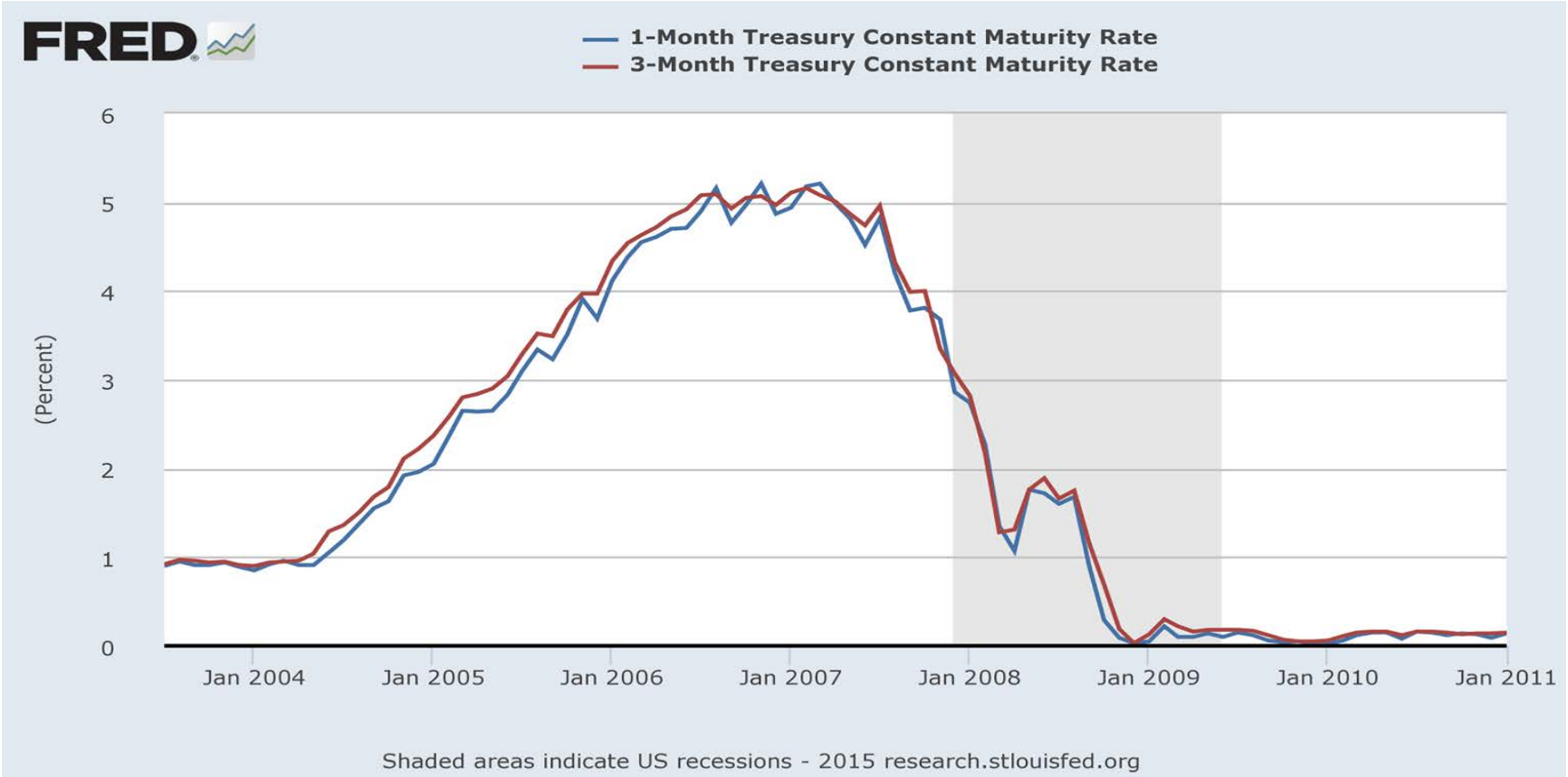
Increase in the Demand for Money



Some Data


FRED
1-Month Treasury Constant Maturity Rate
(Percent)
6
5
4
3
2
1
0
Jan 2004
Jan 2005
Jan 2006
Jan 2007
Jan 2008
Jan 2009
Jan 2010
Jan 2011
Source: Board of Governors of the Federal Reserve System (US)
Shaded areas indicate US recessions - 2015 research.stlouisfed.org

Some Data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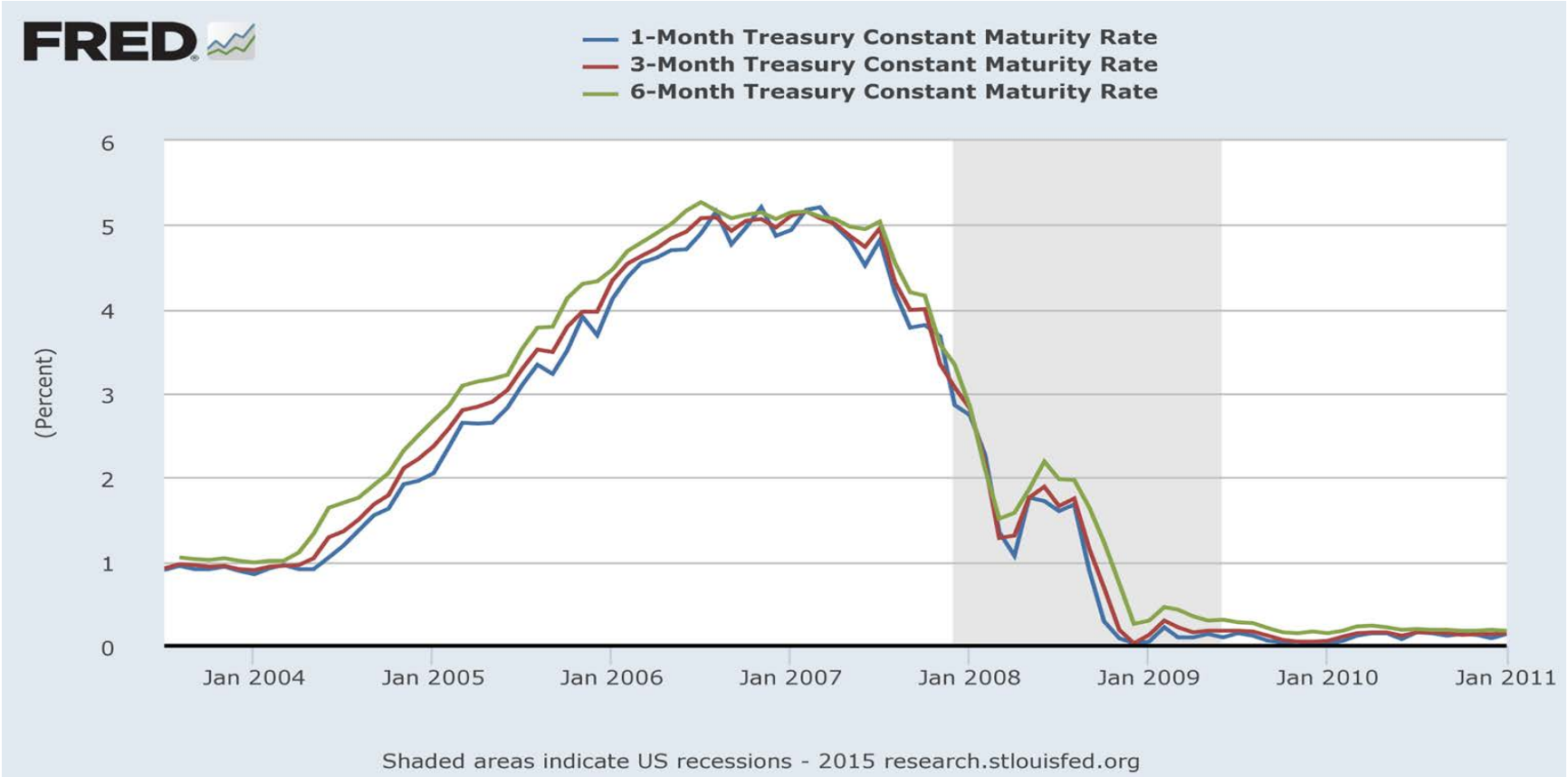
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1-Month Treasury Constant Maturity Rate
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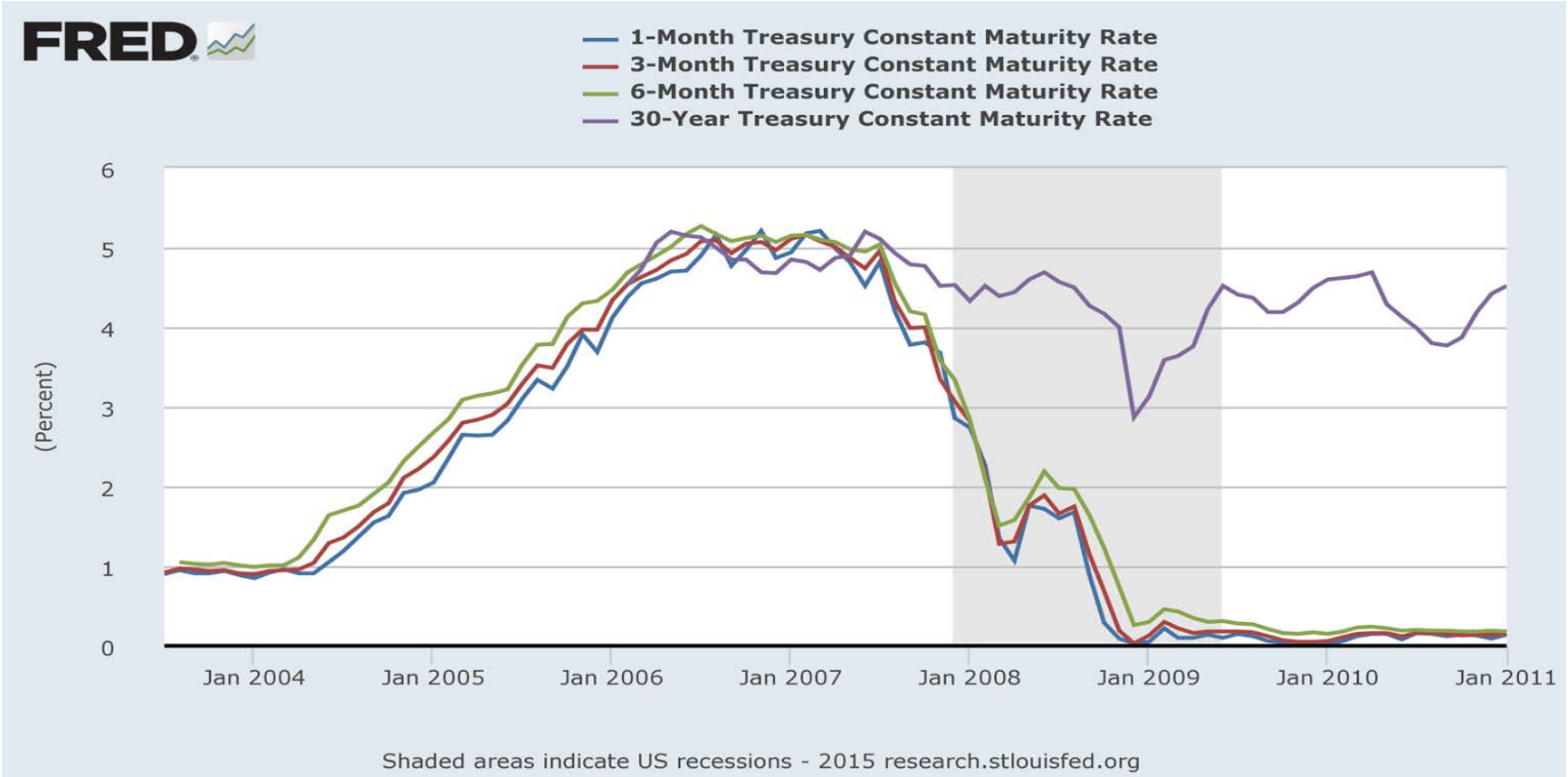
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6-Month Treasury Constant Maturity Rate
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The Market for Loanable Funds

- Previous approach:
  - Preference for liquidity ⇨ demand for money
  - Money supply and demand ⇨ interest rate

- Another determinant of interest rate
  - The supply and demand for funds

- Savers and borrowers meet on financial markets
  - Savers supply funds
  - Borrowers demand funds
  - Equilibrium interest rate is determined

The Supply and Demand for Funds

- Rate of return on a “project”

$$Rate\ of\ return = \frac{What\ you\ get - what\ you\ paid}{what\ you\ paid}$$

- Cost of borro…

$$Rate\ of\ interest = \frac{What\ you\ repay - what\ you\ borrowed}{what\ you\ borrowed}$$

The Supply and Demand for Funds

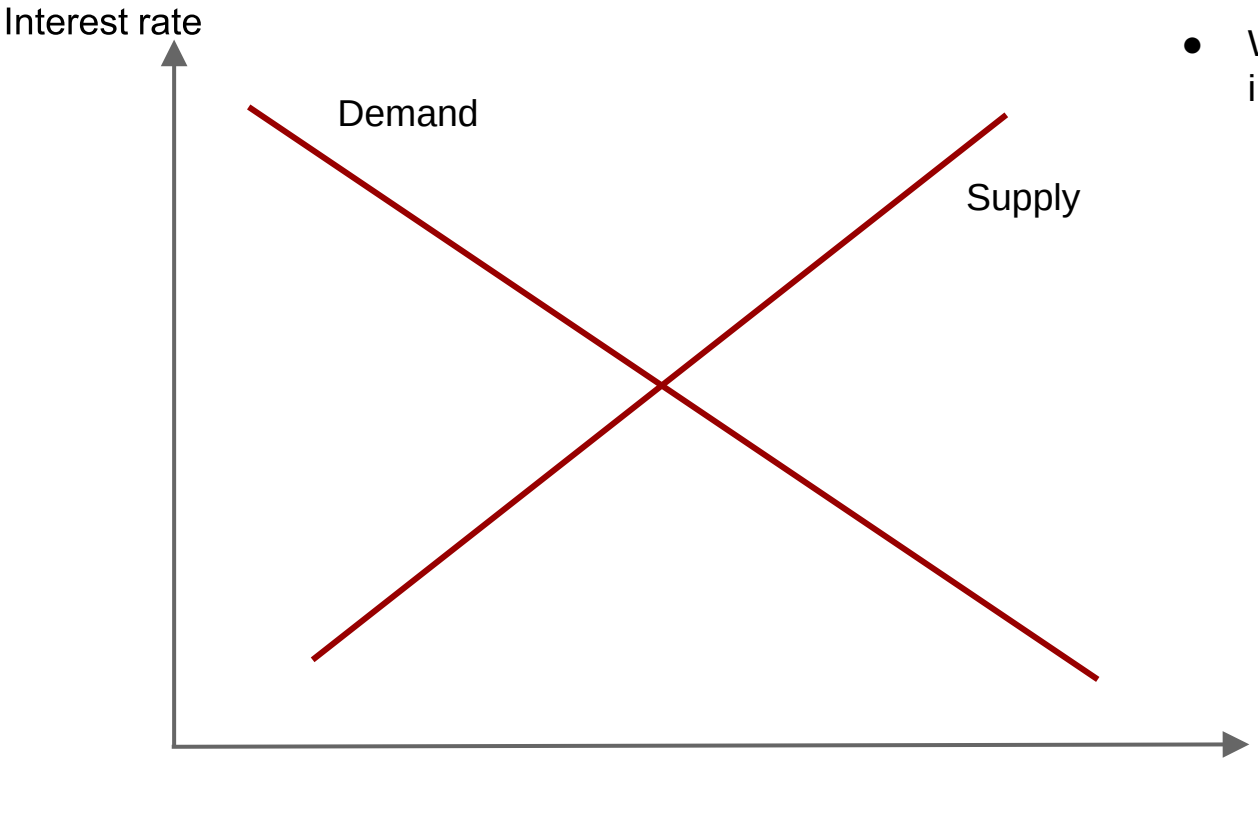
- Example
  - A project cost $1.0M and is expected to create $1.1M in revenue in 1 year

$$Rate\ \ of\ \ return = \frac{1.1 - 1.0}{1.0} = 0.1 = 10\%$$

  - Can borrow $1.0M on financial markets => must reimburse $1.05M in 1 year

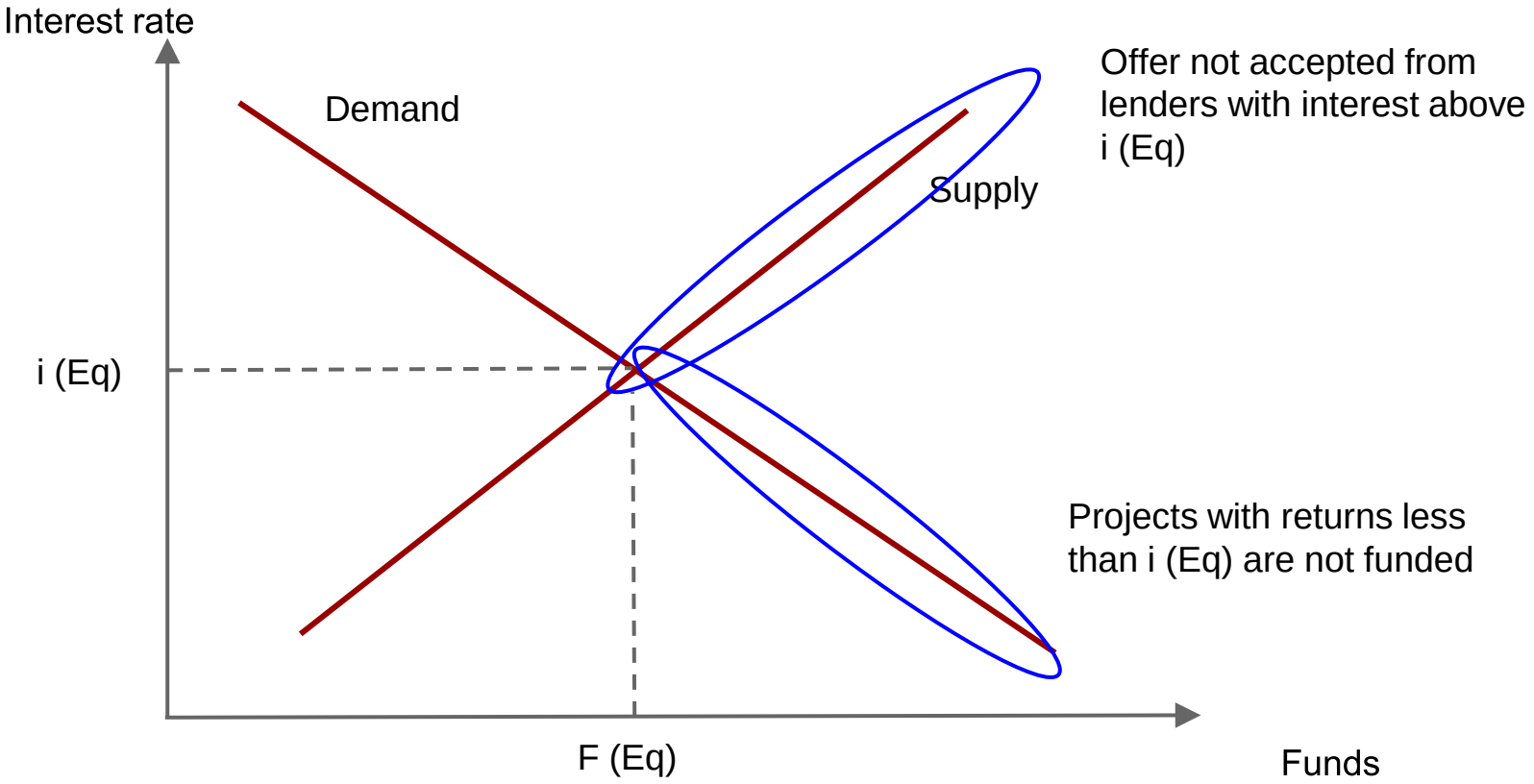
$$Rate\ \ of\ \ interest = \frac{1.05 - 1.0}{1.0} = 0.05 = 5\%$$

The Supply and Demand for Funds

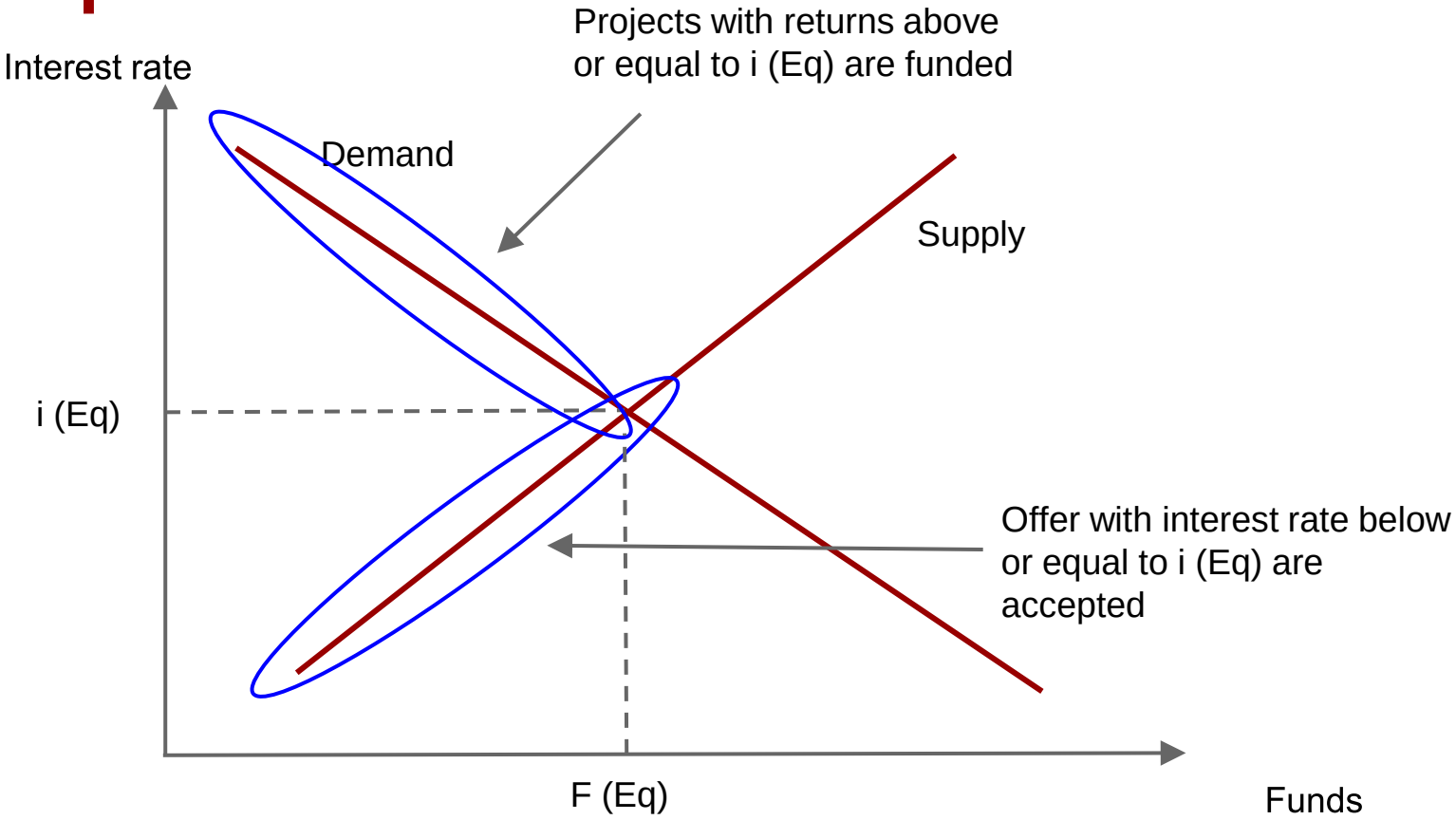


- When the interest rate increases
  - Less projects financed by borrowing ⇨ the demand for funds decreases
  - Saving becomes more profitable ⇨ the supply of funds increases

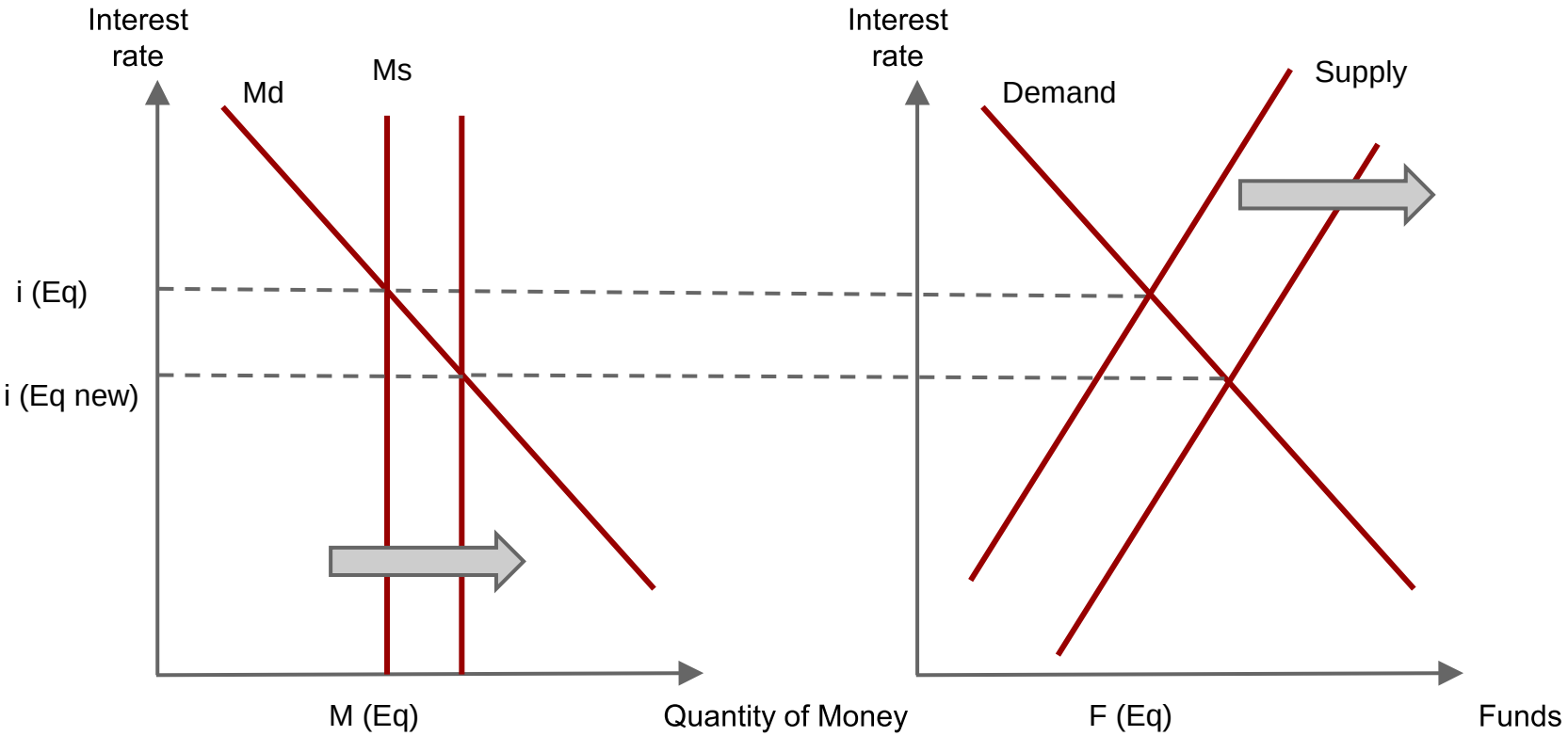
Equilibrium



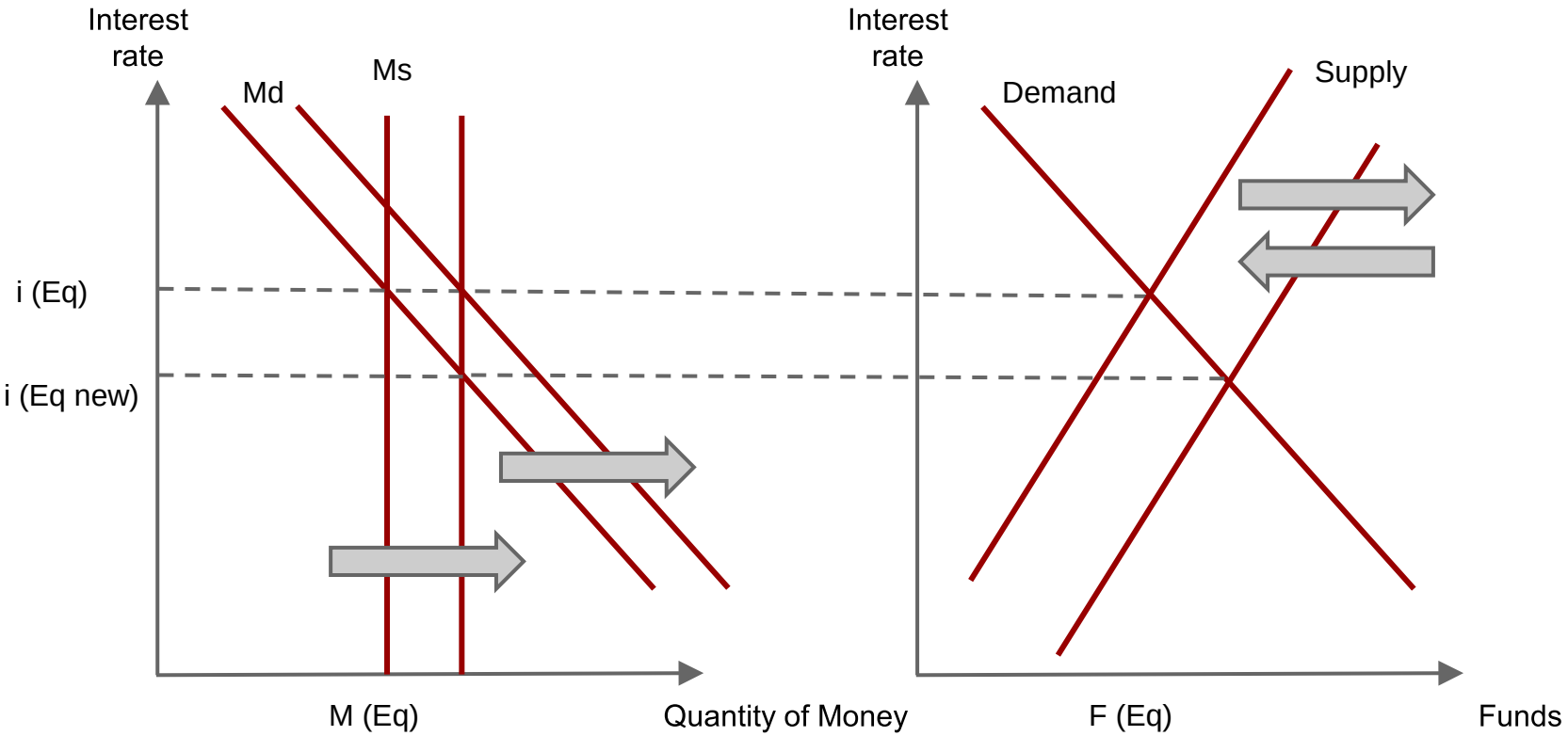
Equilibrium



Reconciling the Two Theories



Neutrality of Money in the Long Run

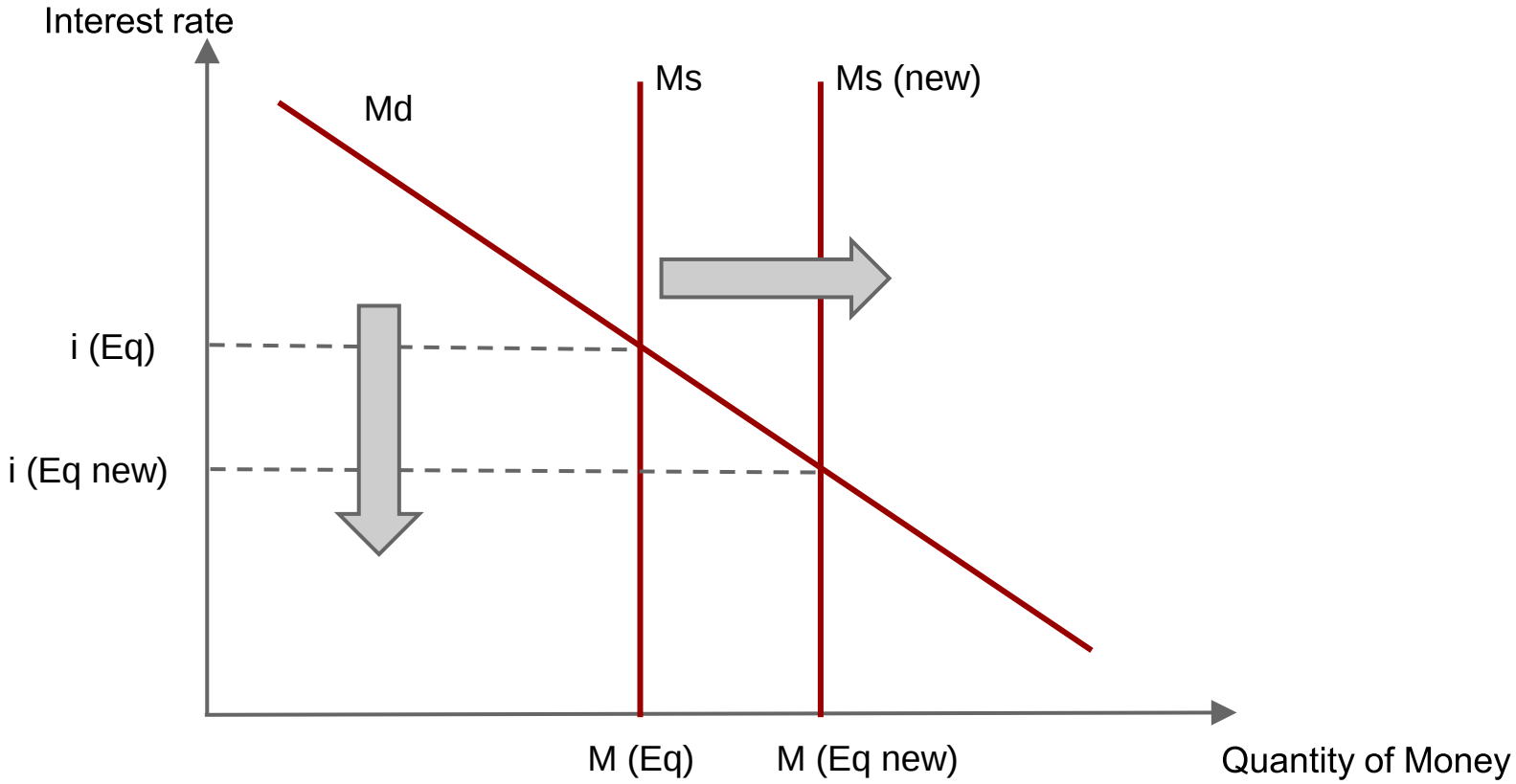


Monetary Policy

- The central bank (the FED) uses the money supply as instrument to control the rate of interest

- Open Market Operations
  - FED buys bonds from banks ⇨ banks receive money ⇨ make loans ⇨ money supply increases
  - FED sells bonds to banks ⇨ banks pay with money ⇨ make less loans ⇨ money supply decreases

Increase in the Supply of Money



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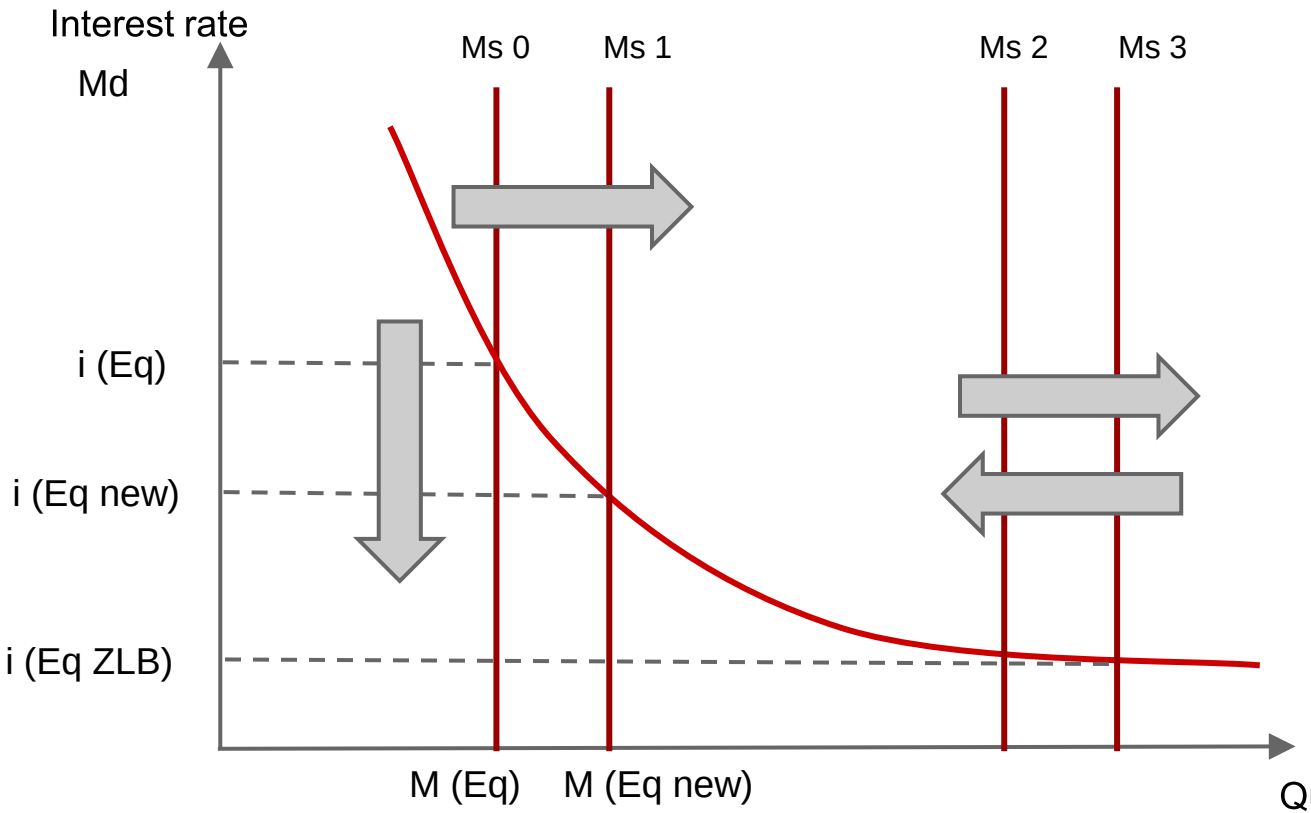
The “zero lower bound”



When the rate is very low (e.g. zero) the cost of holding $1M or $100M is the same: The demand for money is flat