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# Money Demand and Money Market Equilibrium

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Chapter 12 (p. 313-325)

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# Money Demand

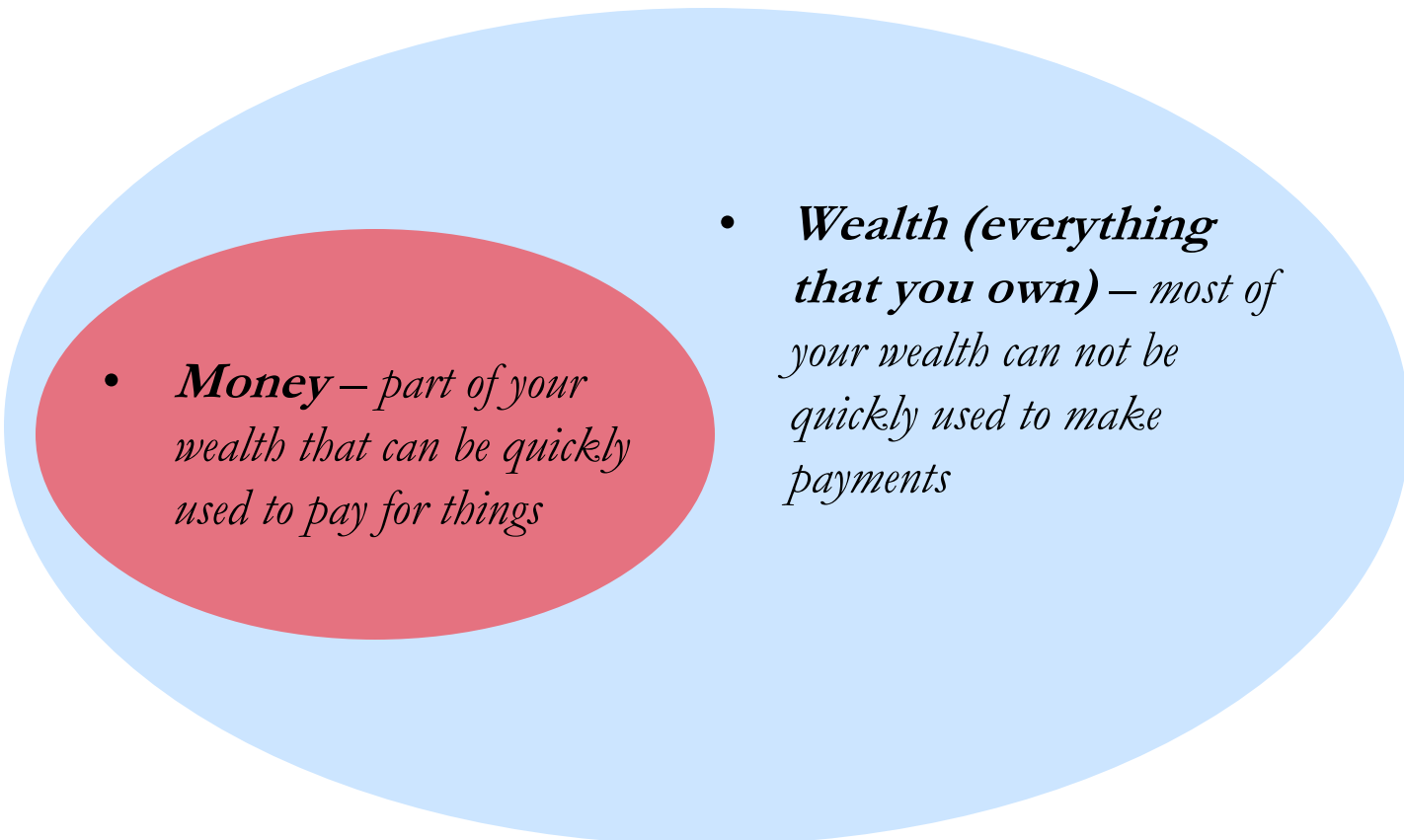
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# Money Demand

- Individual demand for money
  - Amount of wealth intended to be held as money, rather than other assets
- Key cost and benefit analysis behind the demand for money
  - Money useful as means of payment
  - Costly to hold because of the lost interest that other assets pay (bonds, stocks...)

# Wealth and Money

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- **Money** – part of your wealth that can be quickly used to pay for things

- **Wealth (everything that you own)** – most of your wealth can not be quickly used to make payments

# Modeling Money Demand

- **Simplification:** Households and businesses divide their wealth between just two assets
  - Money (liquid asset)
    - Useful as means of payment, but earns no interest
  - Bonds (illiquid asset)
    - Earns interest but is not useful as means of payment
  - $\text{Wealth} = \text{bond holdings} + \text{money holdings}$

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# Properties of Individual Money Demand

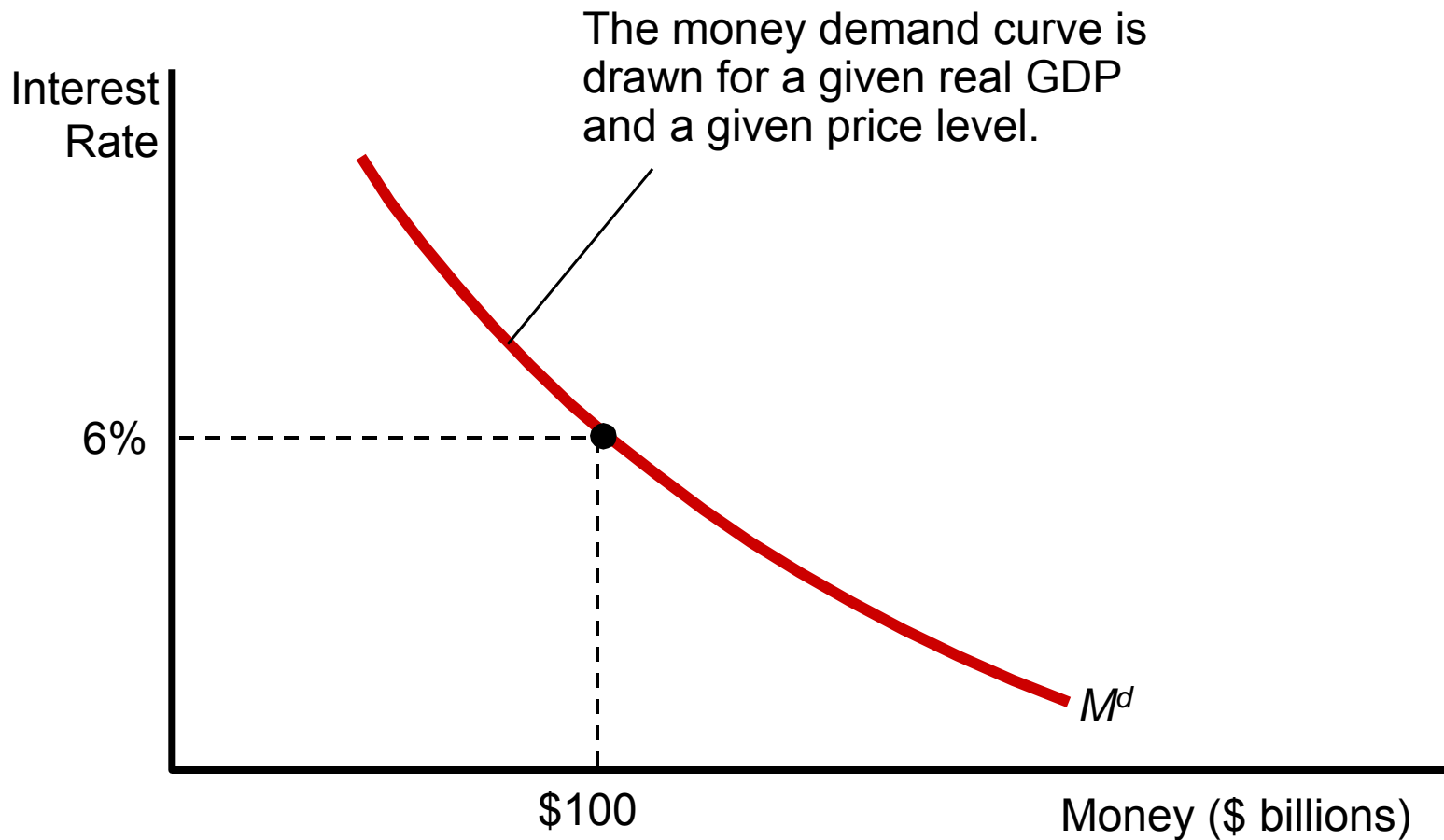
- Cost and benefit analysis implies:
  - Demand for money (liquidity) increasing in
    - Price level
    - Real income
  - Demand for money decreasing in
    - Nominal interest rate (opportunity cost of holding money)

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# Properties of Aggregate Money Demand

- **Aggregate money demand:** Sum of money demand of all individuals in the economy
- Inherits properties of individual money demand, and thus
  - Increasing in real GDP
  - Increasing in aggregate price level
  - Decreasing in market nominal interest rate

# Aggregate Money Demand Curve

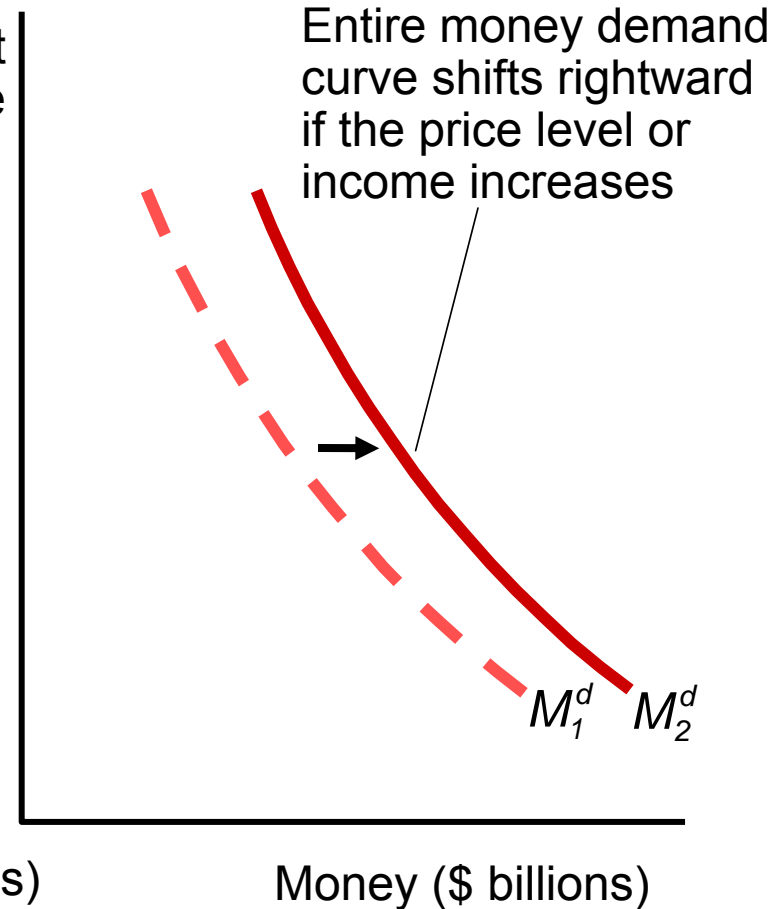
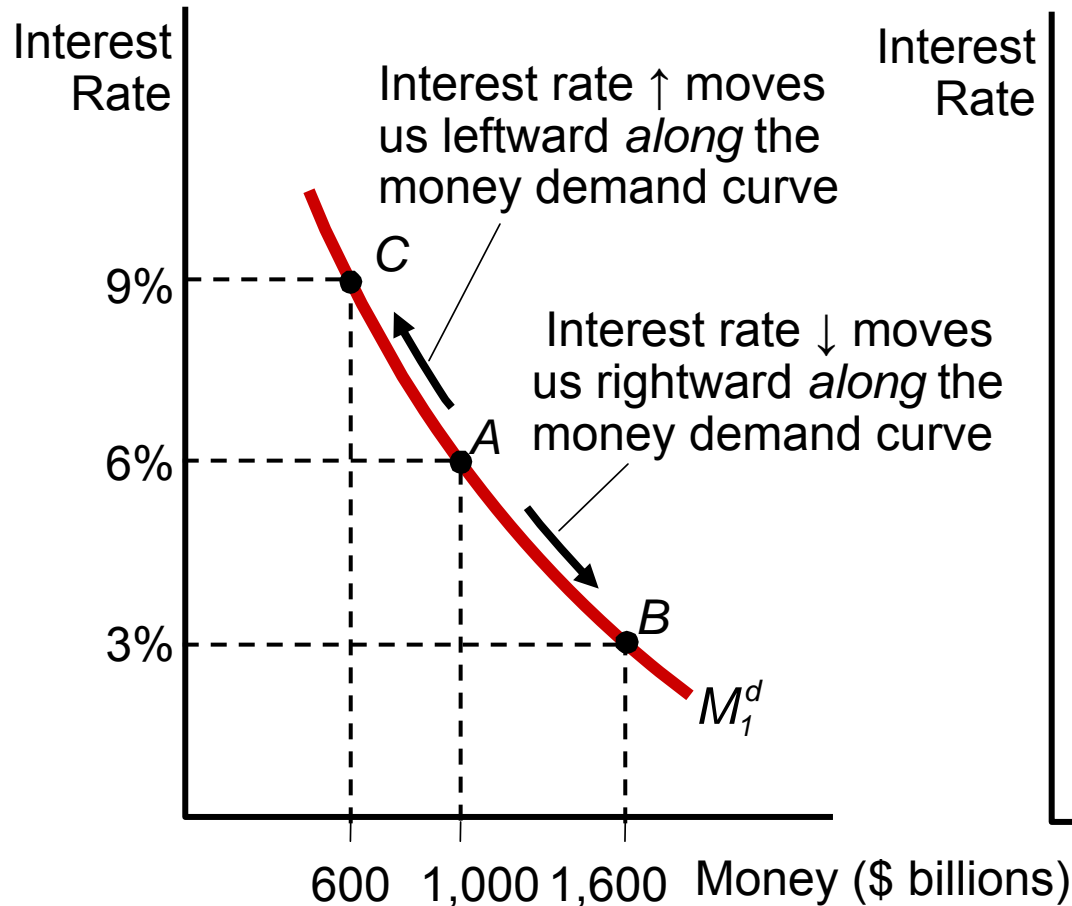


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# Aggregate Money Demand Curve

- **Money demand curve:** Total quantity of money demand for each level of nominal interest rate
  - Movement along the money demand curve
    - A change in the nominal interest rate
  - Shift in the money demand curve
    - A change in real income (real GDP) or price level

# Shifts vs. Movements Along the $M^d$ Curve



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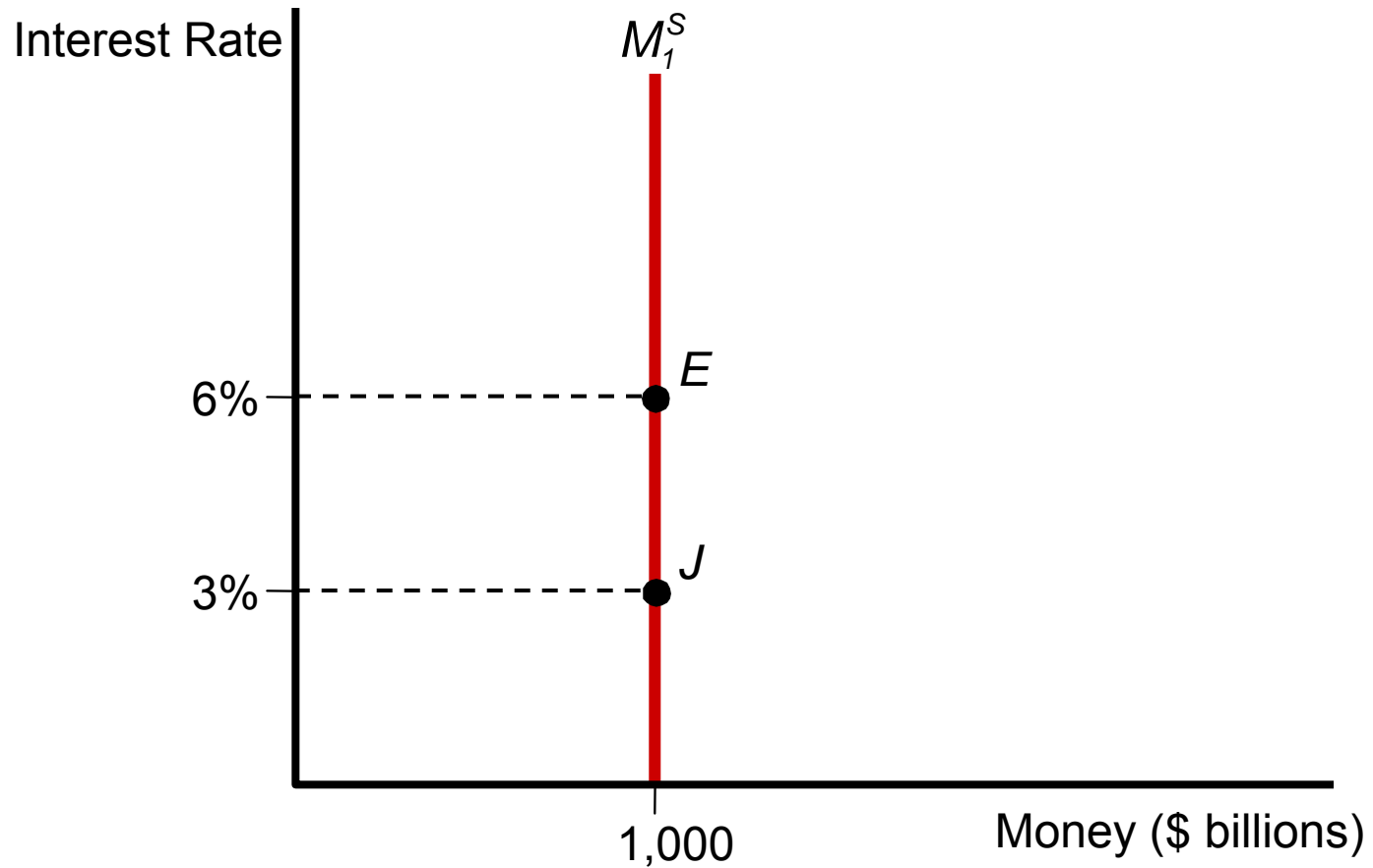
# Money Market Equilibrium

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# Defining Money Supply Curve

- **Money supply curve:** Total quantity of money in the economy for each level of the interest rate
  - Chosen by Fed by choosing **monetary base**
    - Money supply = deposit multiplier x **monetary base**

# Money Supply Curve

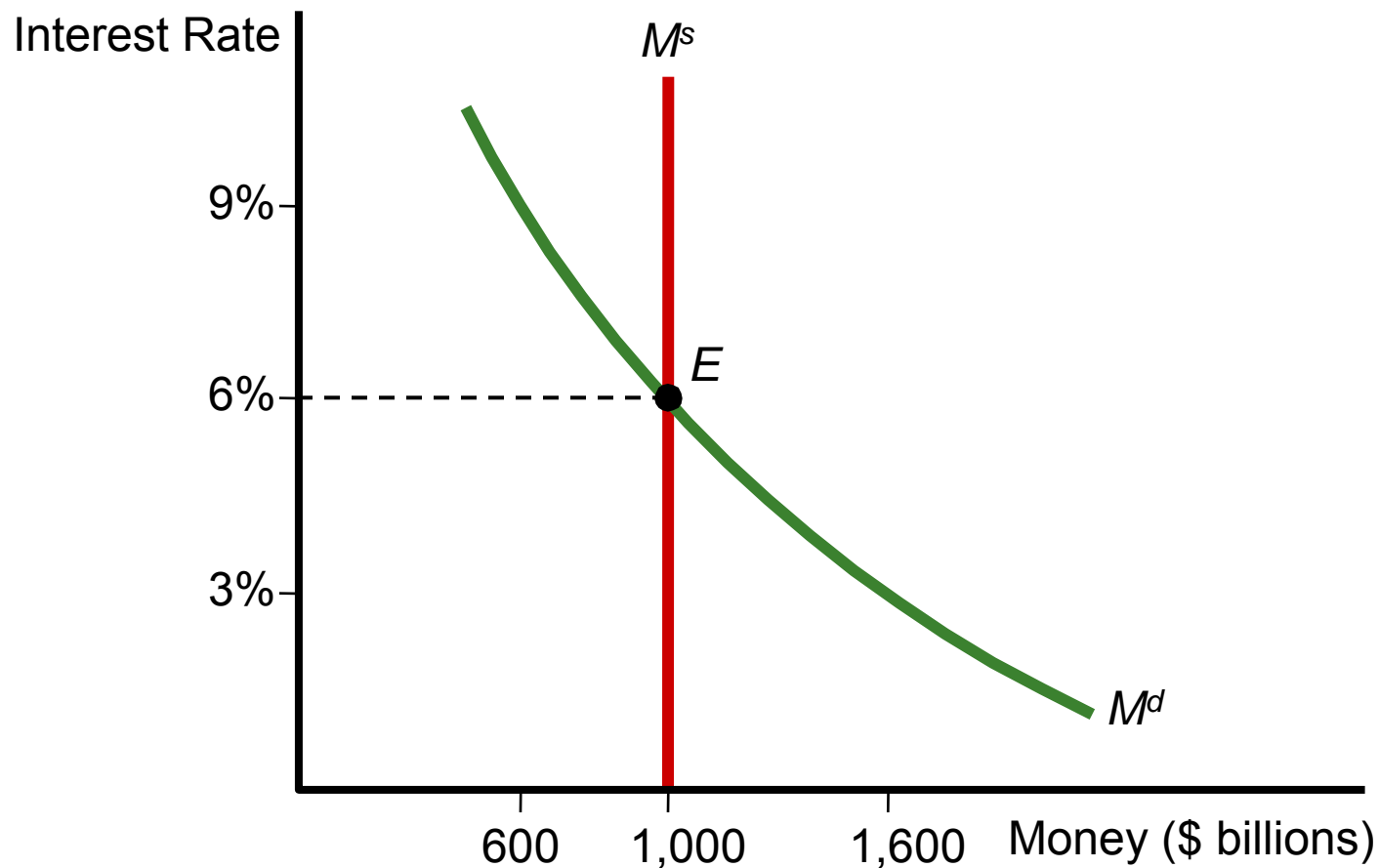


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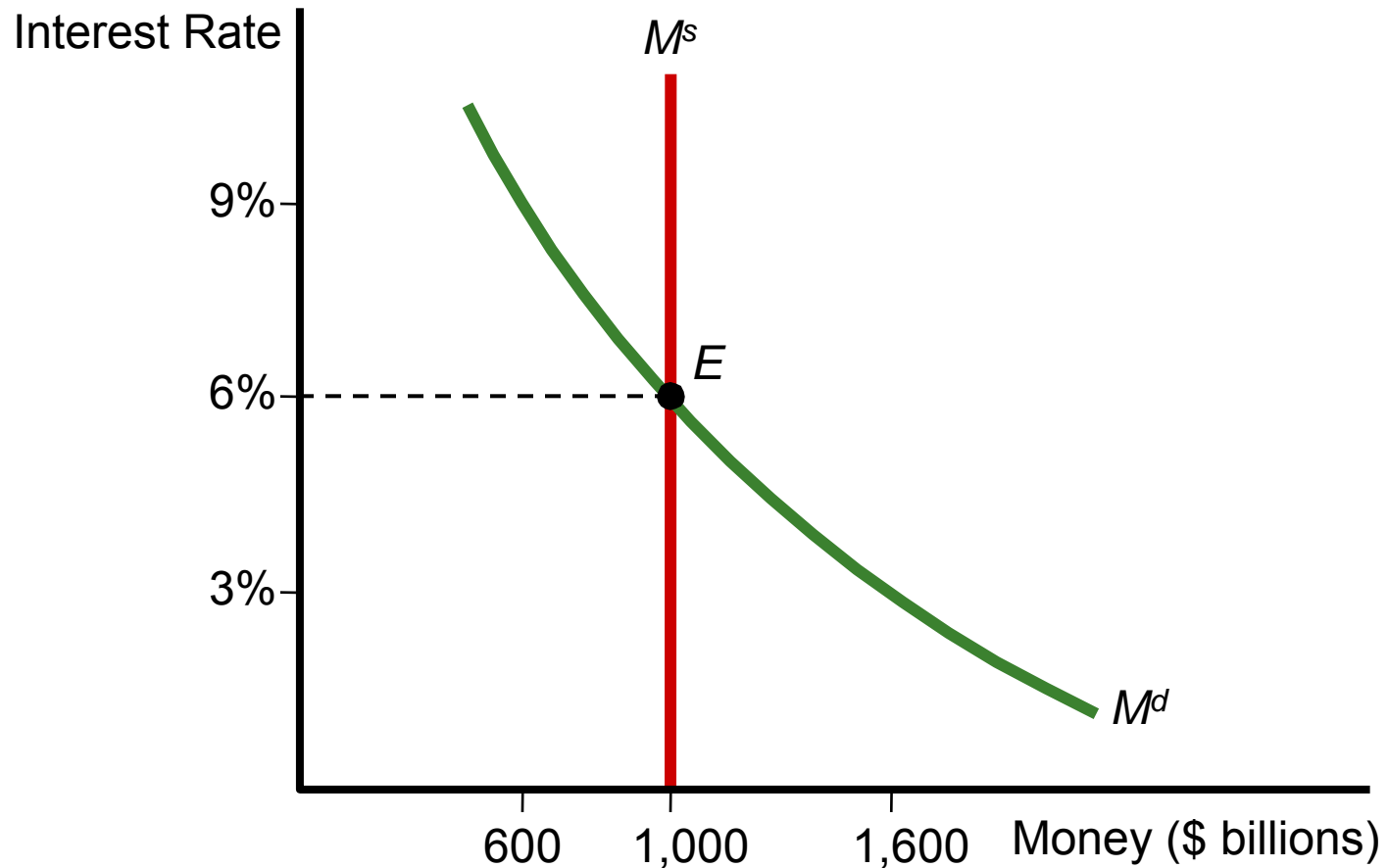
# Shifts in Money Supply Curve

- Rightward shift (monetary expansion)
  - Open market purchases of bonds by the Fed resulting in injection of reserves into the banking system
- Leftward shift (monetary contraction)
  - Open market sales of bonds by the Fed resulting in withdrawal of reserves from the banking system

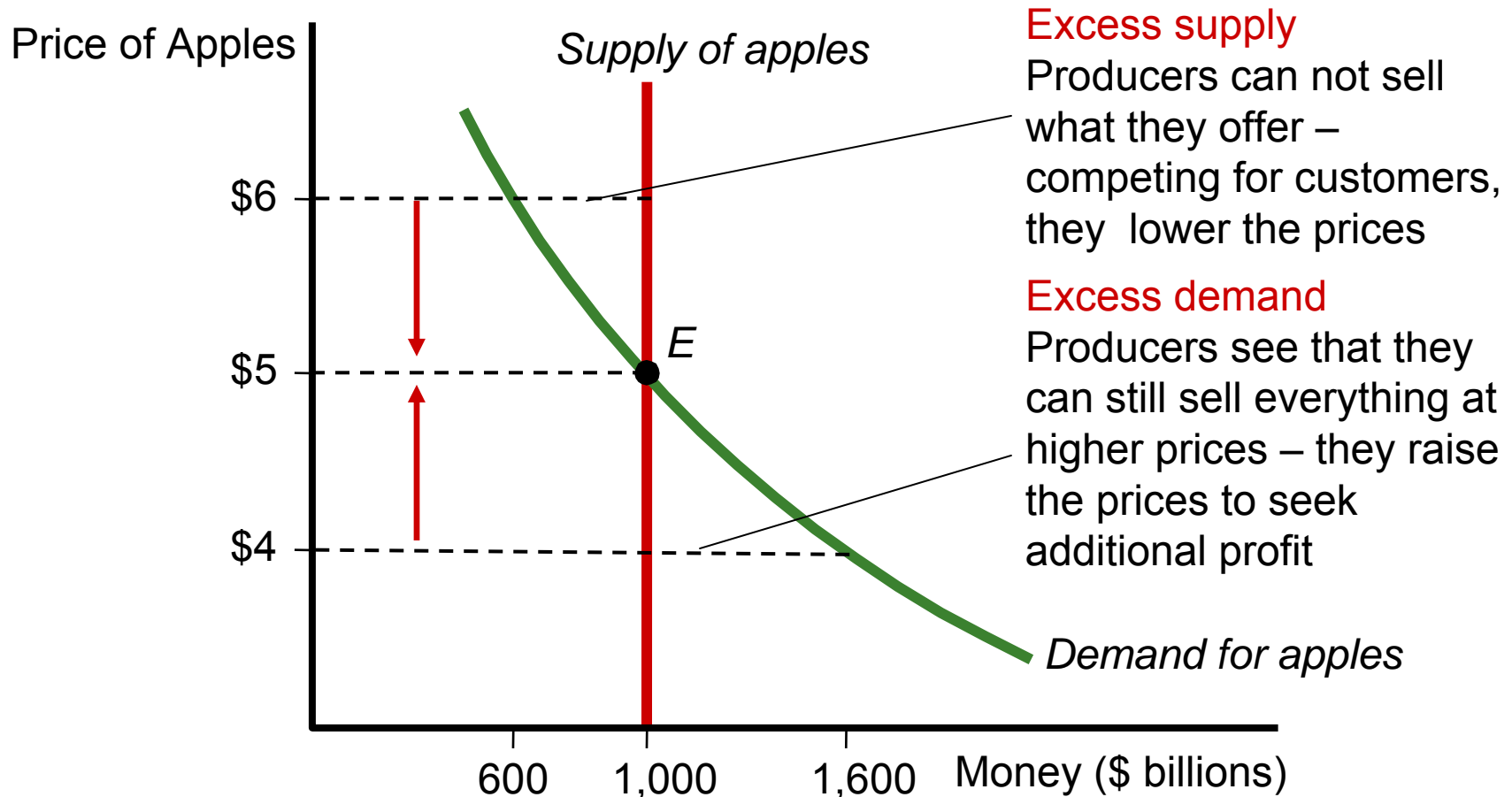
# Money Market Equilibrium



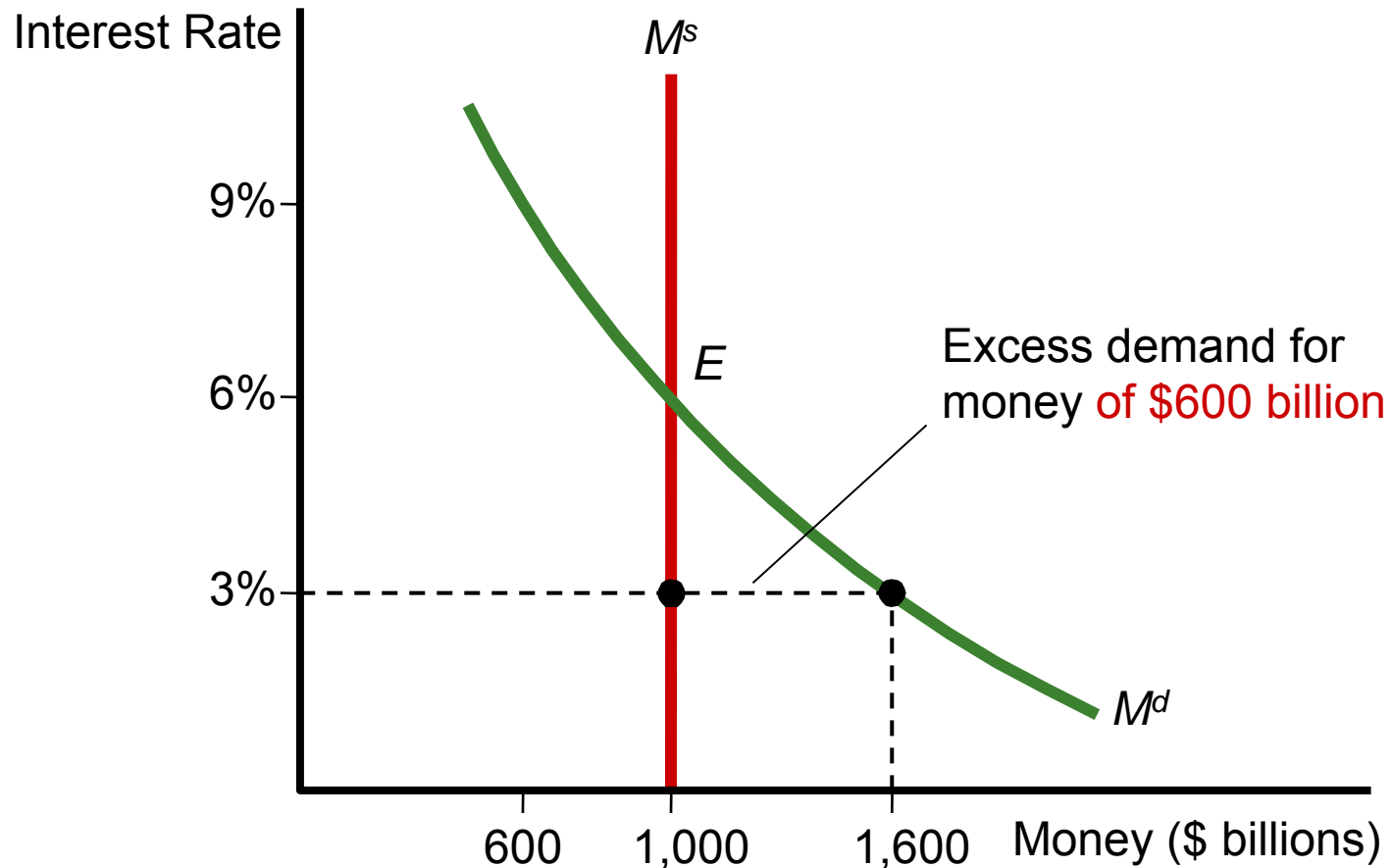
# Why Point E is an Equilibrium?



# Think: Does Standard Logic Apply?



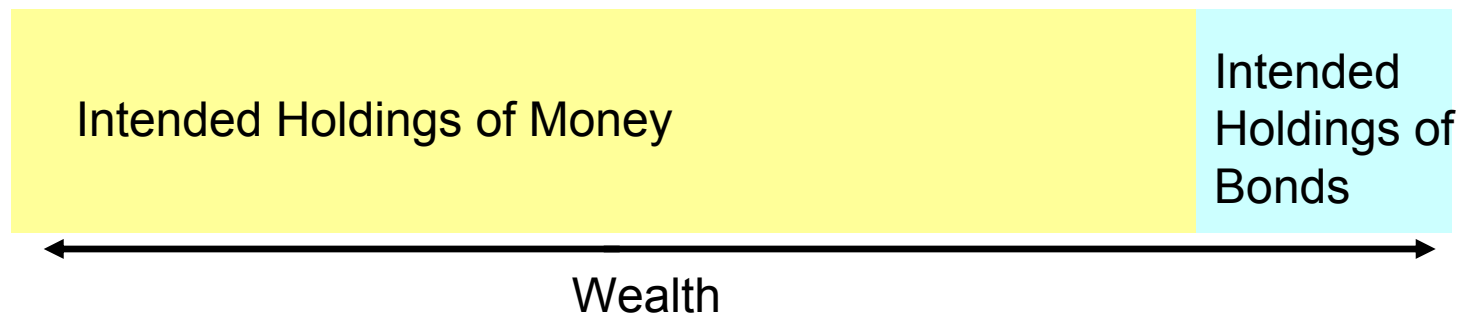
# Think: What if Interest Rate Too Low?



# Link Money Market to Market for Bonds

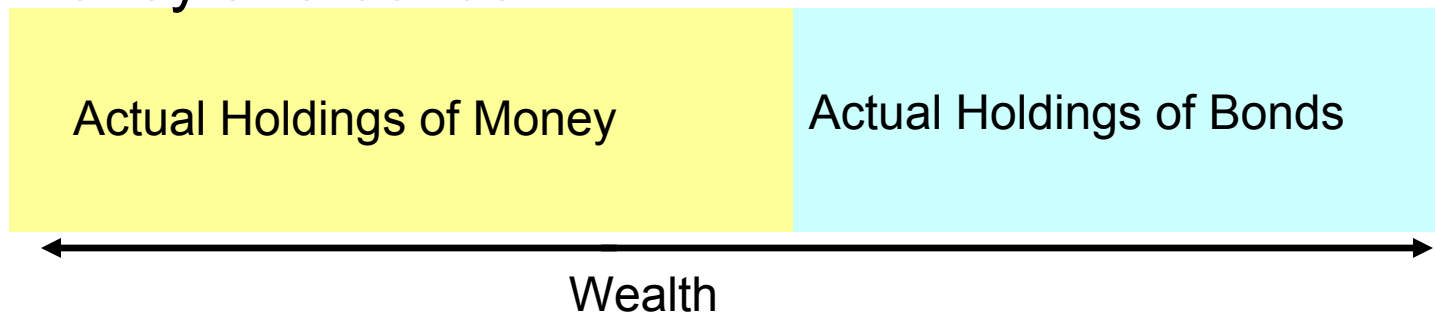
The public divides its wealth into money and bonds

**Money demand tells us how they want to divide it**

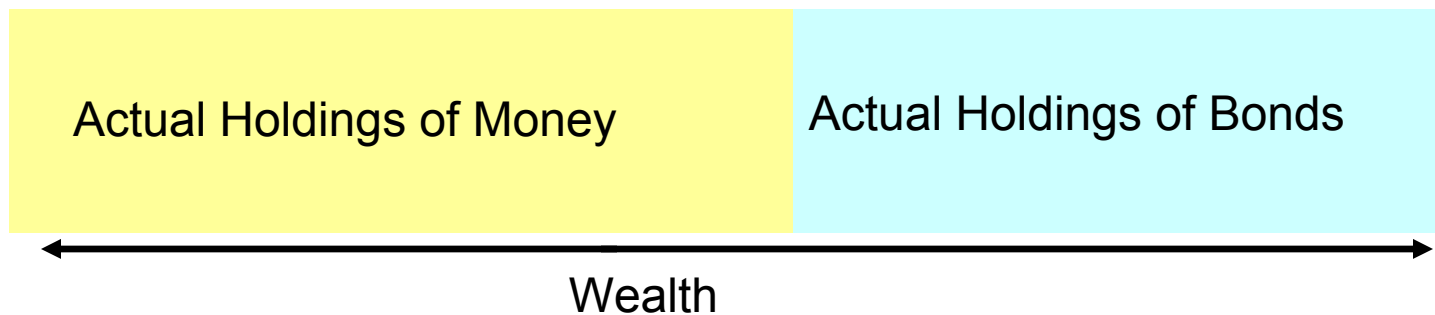
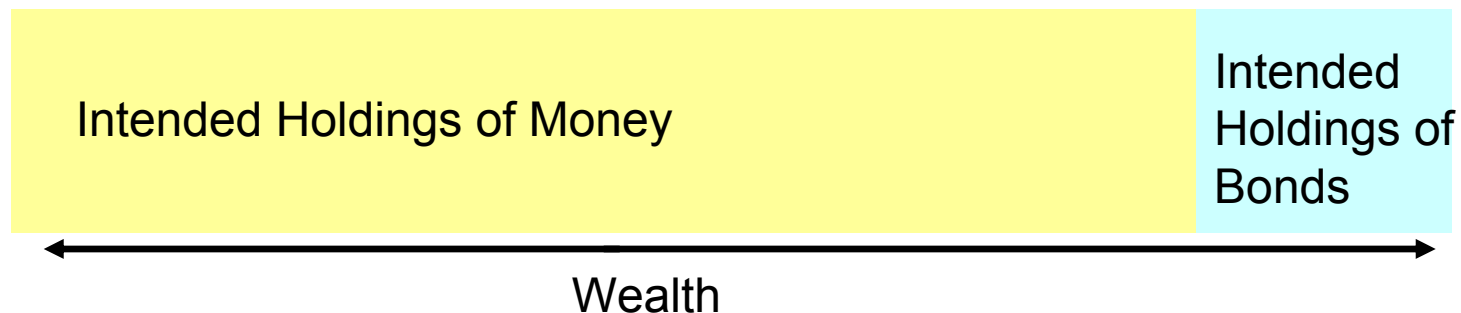


**Money supply tells us how it is actually divided**

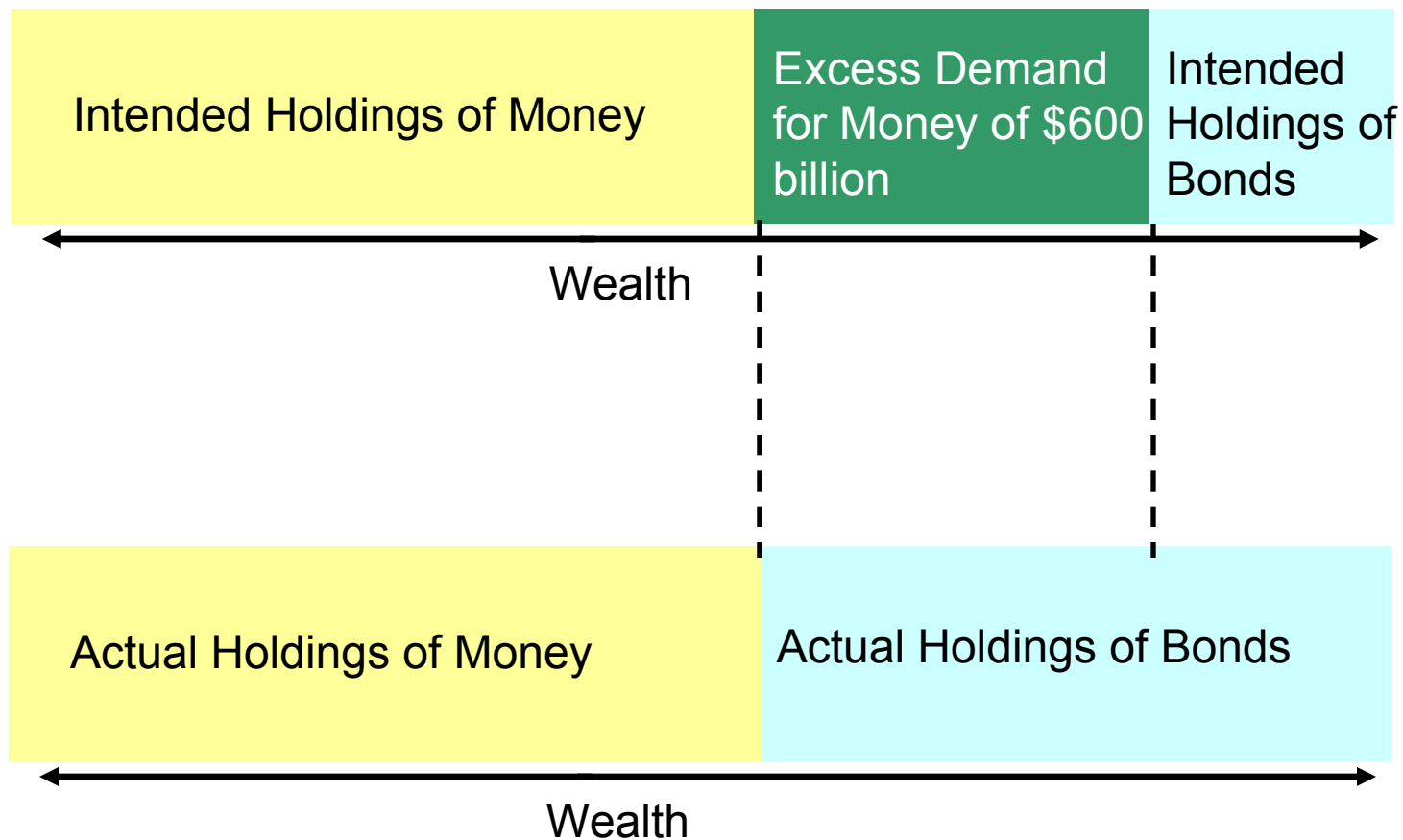
After all, the public must hold all the outstanding money and bonds!



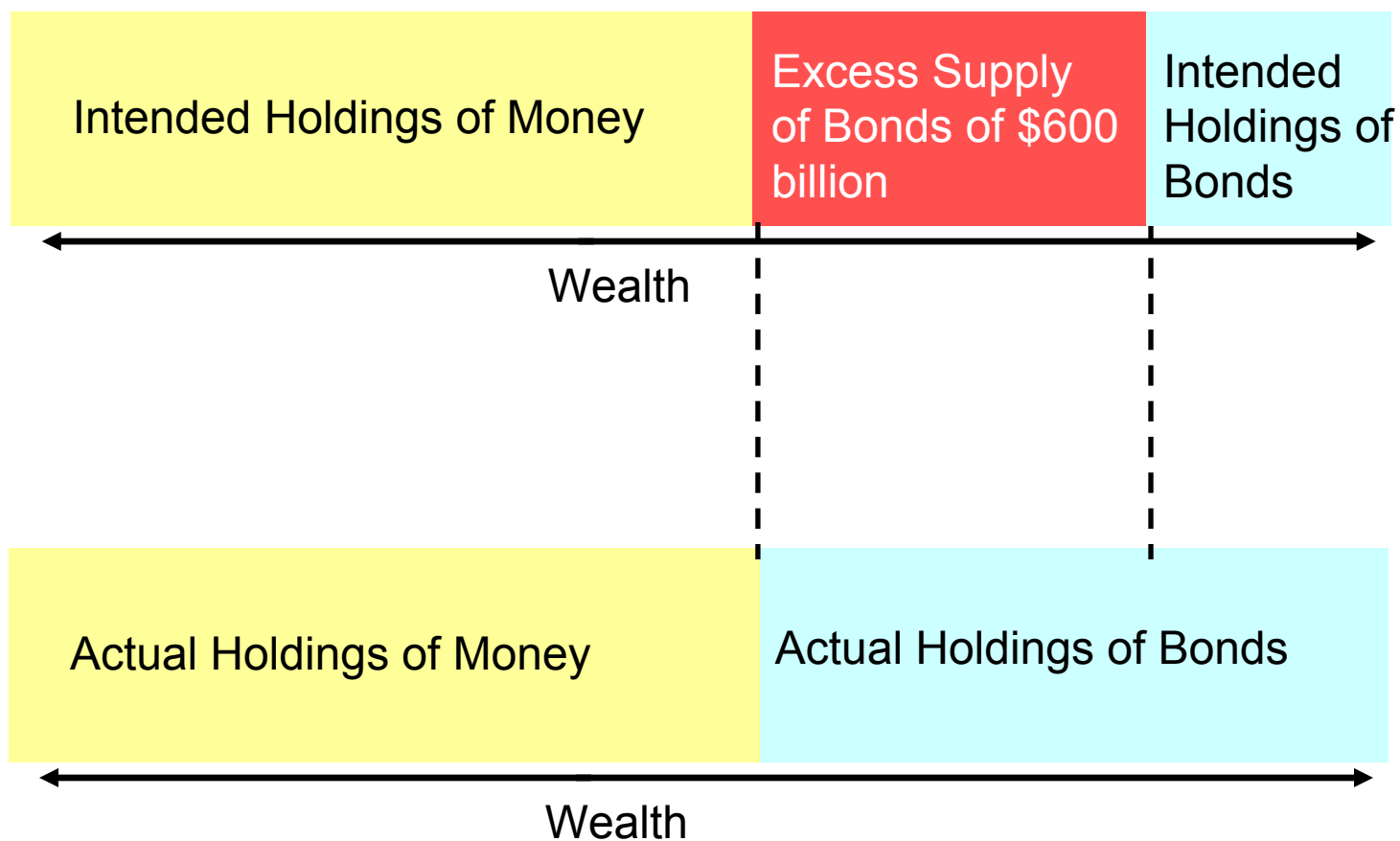
# Link Money Market to Market for Bonds



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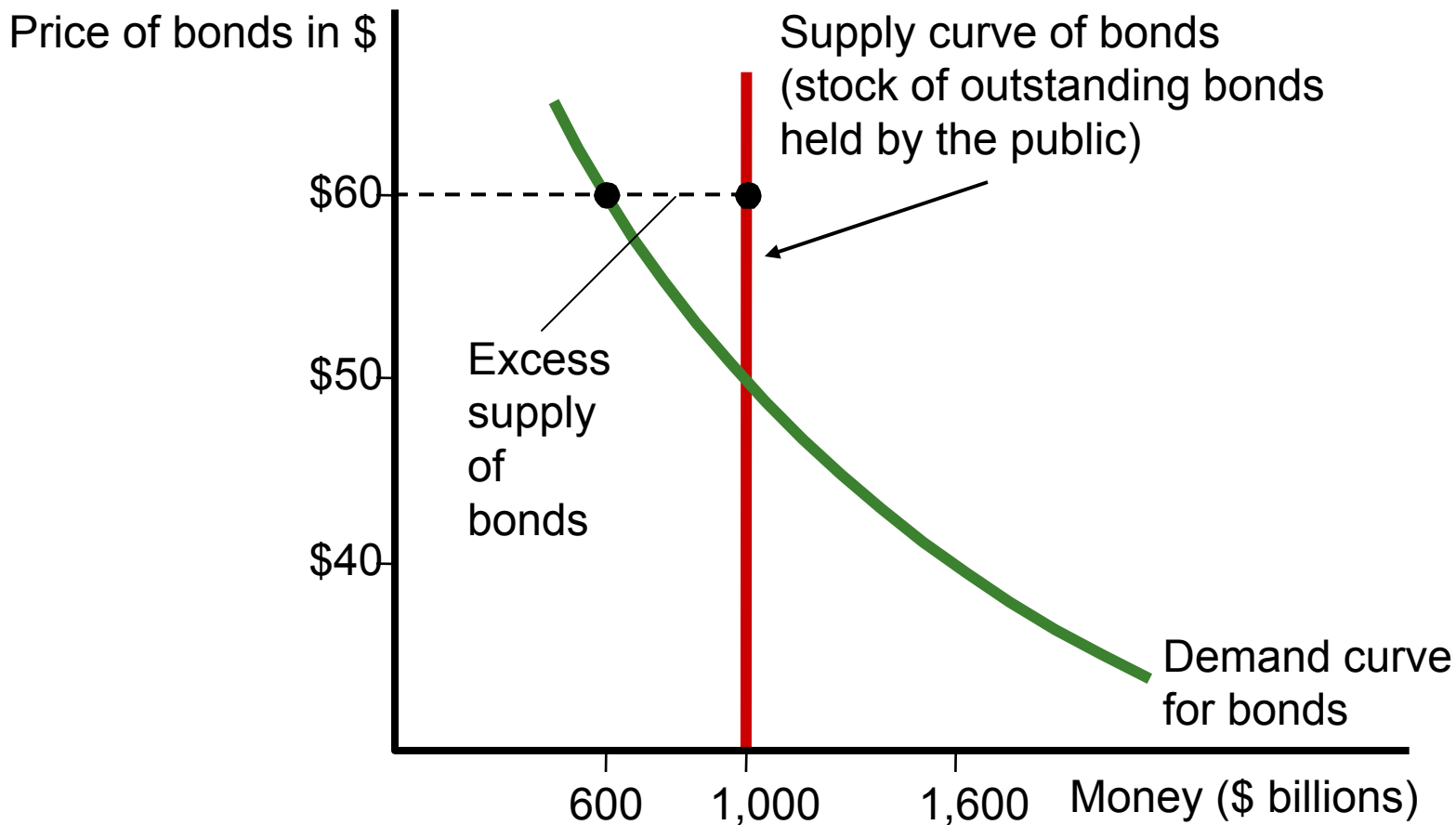
# Market for Bonds is Like Market for Apples

- Excess demand for money = excess supply of bonds
- Standard logic applies
  - Sellers of bonds compete for customers, and lower bond prices
  - Lower bond prices = higher return on bonds (yield) = higher market interest rate!

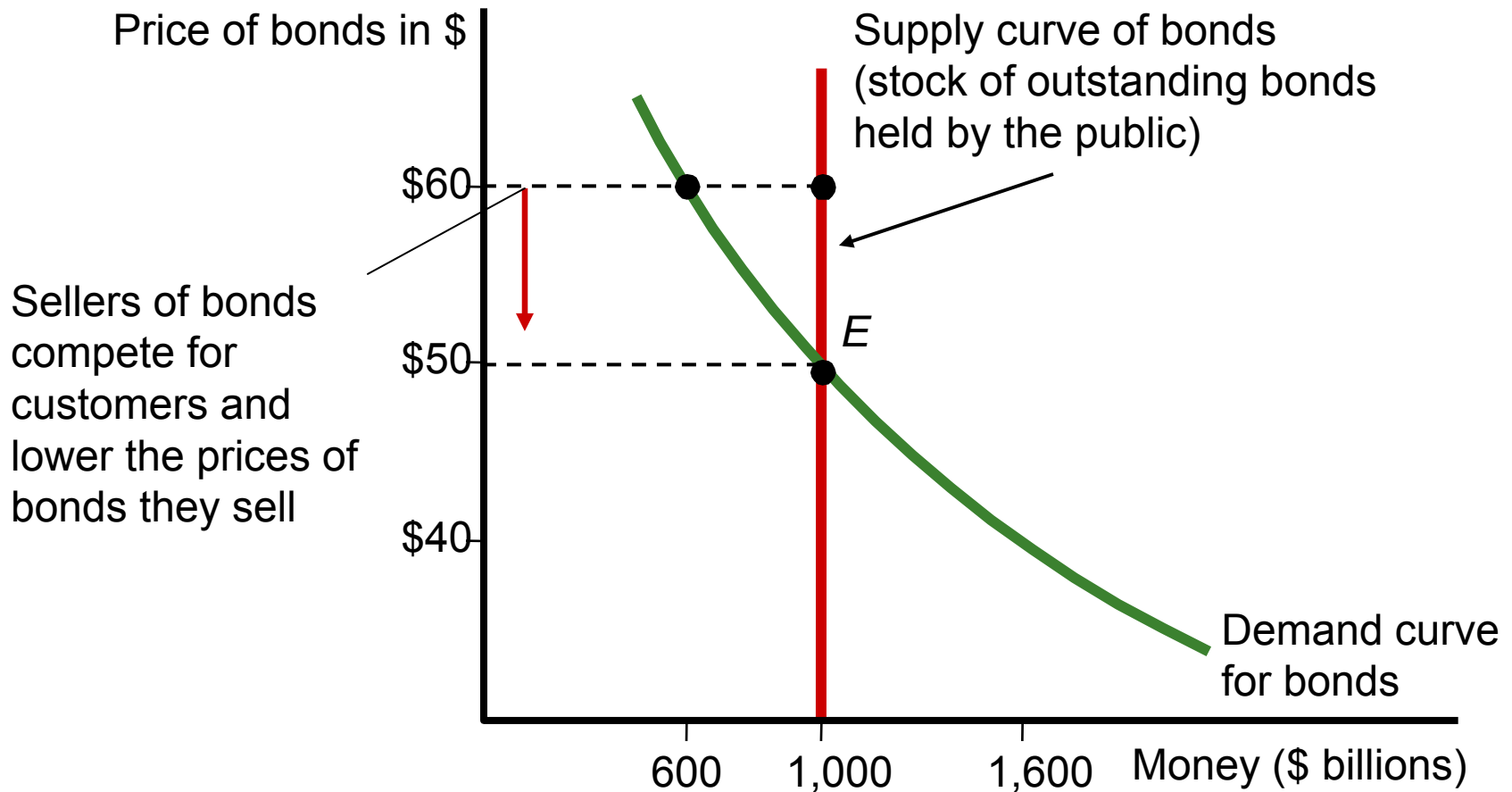
# Why?

- When price of a bond falls, interest rate (return) on the bond goes up, and all the way around
- **Example:** Consider a bond that promises to pay \$110 in one year from now
  - Suppose the price of this bond is \$110 today:
    - Then, yield is  $(110-110)/110*100\%=0\%$
  - Suppose the price of this bond is \$100 today:
    - Then, yield is:  $(110-100)/100*100\%=10\%$

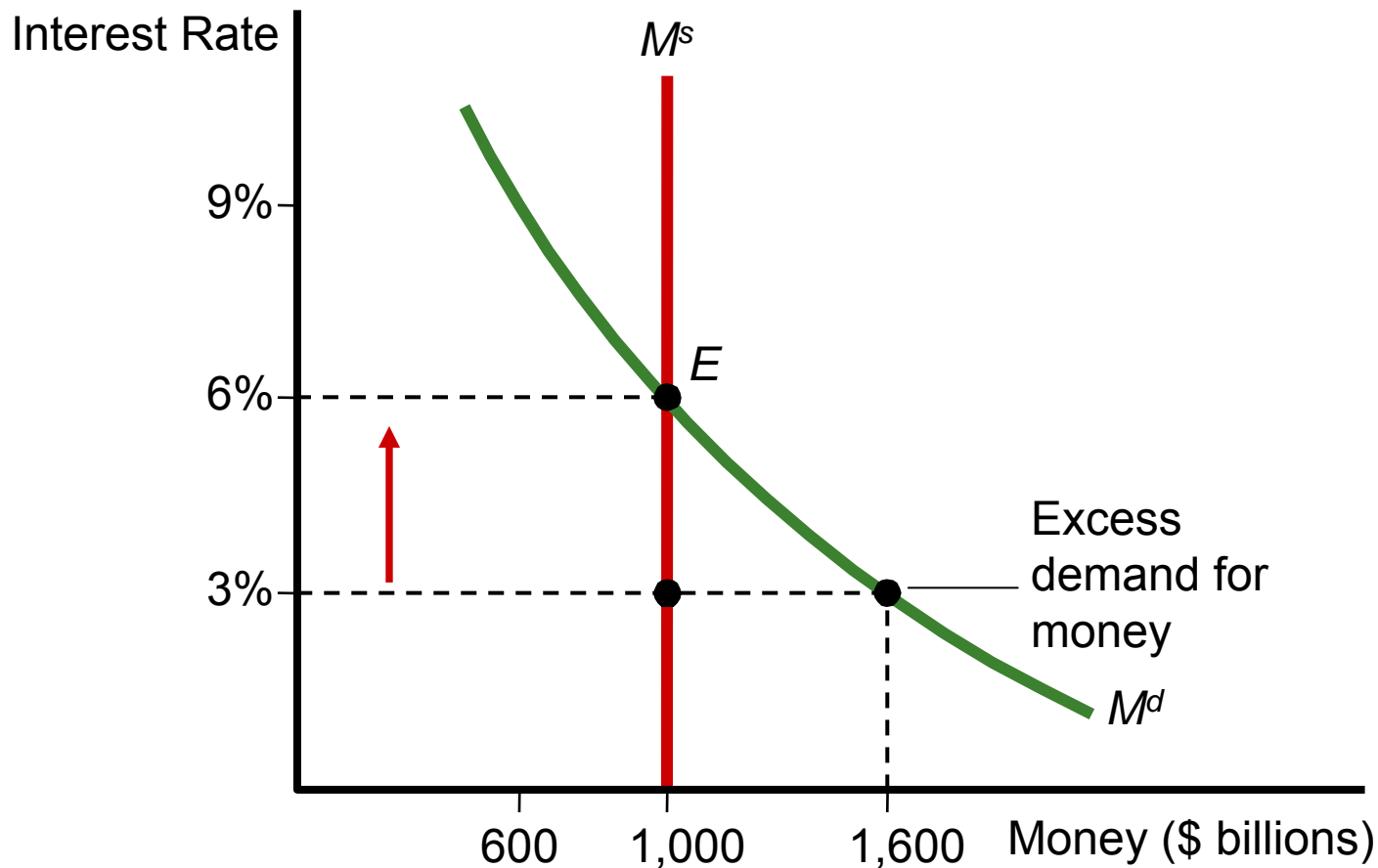
# Standard Logic Applies to Market for Bonds



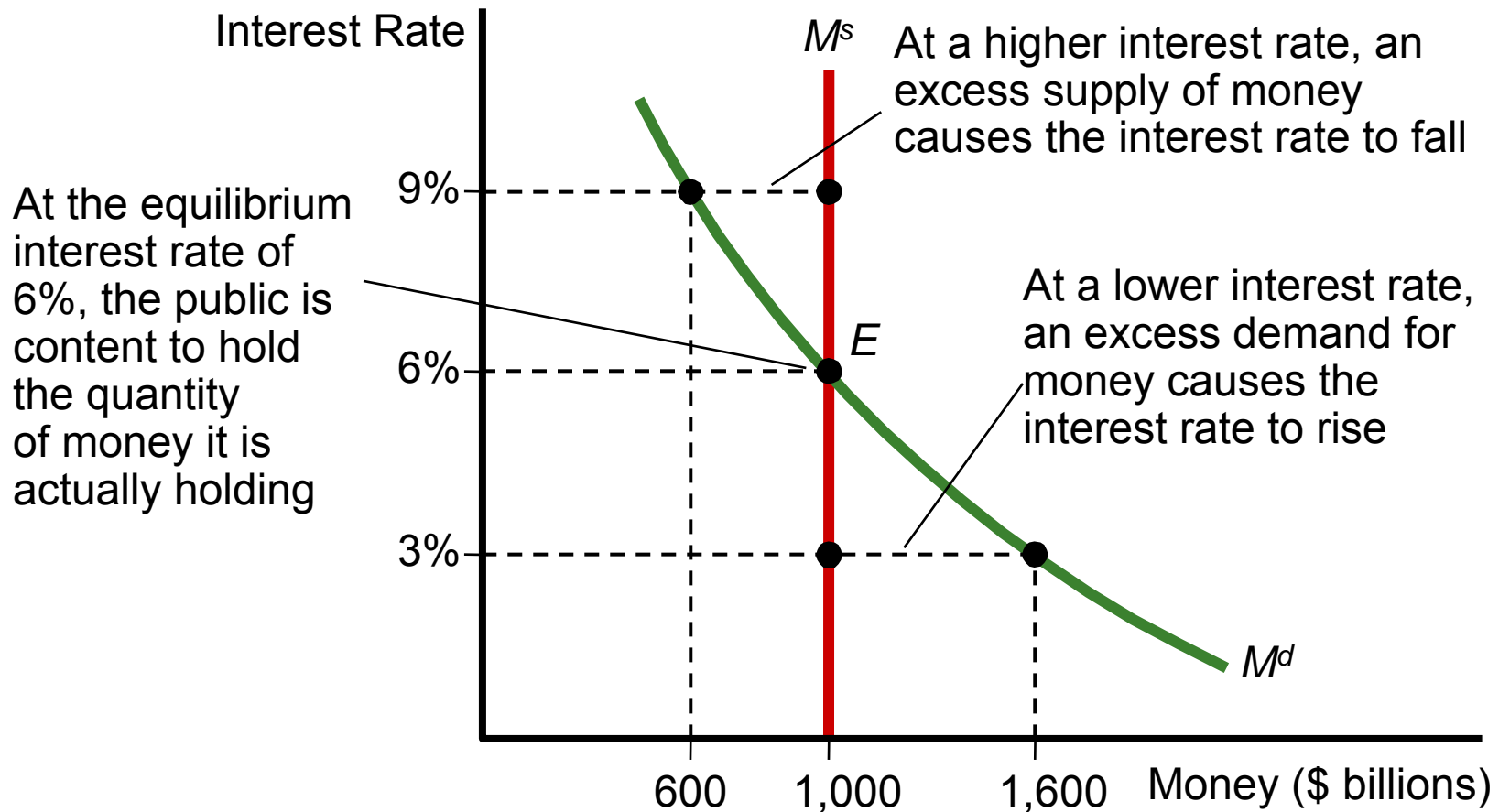
# Standard Logic Applies to Market for Bonds



# Implications for Money Market



# Summary: Money Market Equilibrium



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# Irrelevance of the Choice of Monetary Policy Instrument

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# Choice of Monetary Policy Instrument

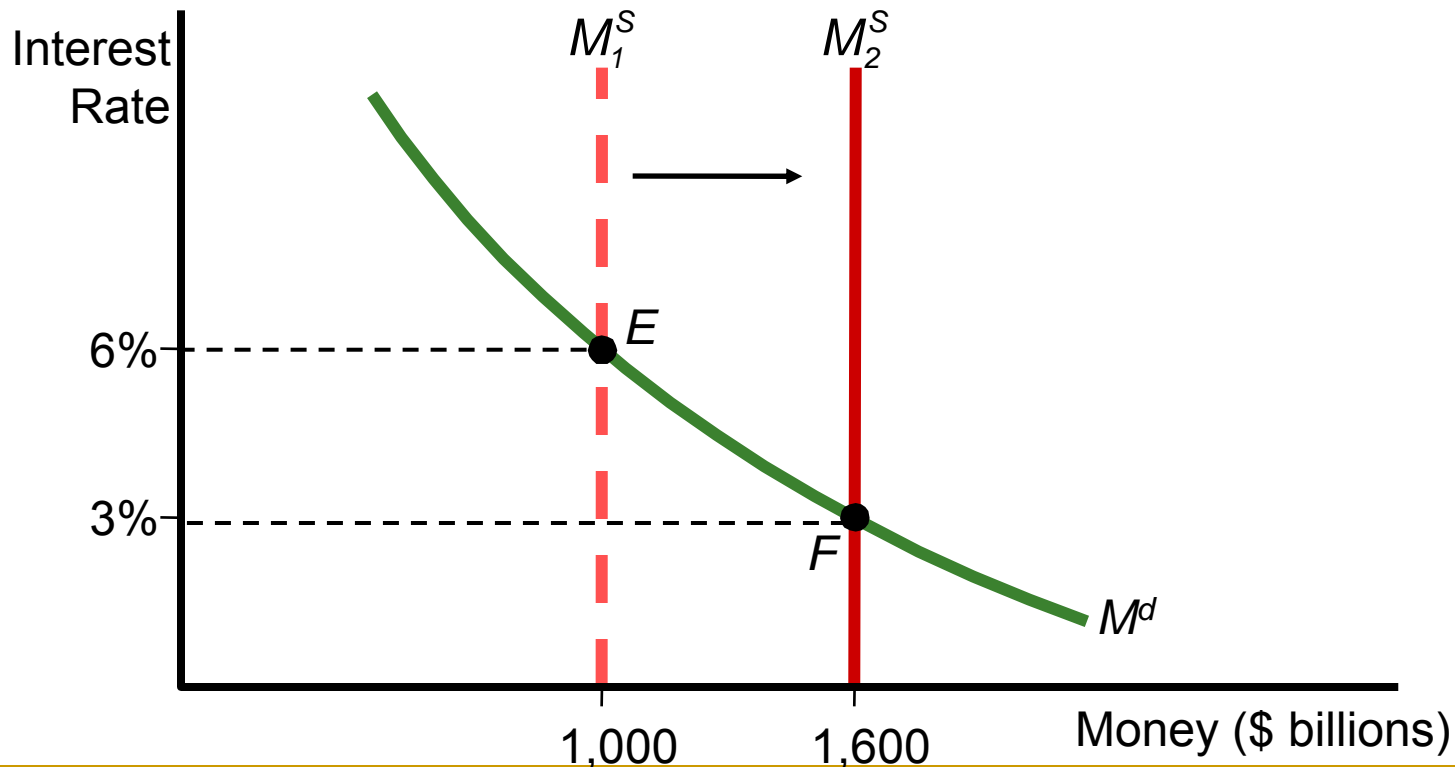
- Due to practical considerations, FED finds it more convenient to announce the interest rate target rather than money supply target
- It is the same thing in our model!

# Why?

- When Fed chooses money supply, it effectively chooses the interest rate, and all the way around
  - Example: Suppose Fed announces a fall in interest rate target from 6% to 3%
    - To do it, the FED anyway needs to increase money supply by \$600 billion
    - Could well just announce the latter, and the effect would be the same!

# Why?

- To lower interest rate from 6% to 3% FED needs to increase money supply by \$600 billion – could well just announce the latter



# Why?

- To lower interest rate from 6% to 3% FED needs to increase money supply by \$600 billion – could well just announce the latter

At point *E*, the money market is in equilibrium at an interest rate of 6 percent

