Investment Demand and Saving Supply

ECO 120: Global Macroeconomics

Goals

- Explain how investment and savings are related in equilibrium
- Identify what influences investment demand
- Identify and explain three components of savings supply: private saving, government saving, rest-of-world saving
- Identify what influences private savings, government saving, and rest-of-world saving
- Identify how changes in private saving affect equilibrium outcomes for investment and interest rates
- Identify how changes in government policies affect equilibrium outcomes for investment and interest rates
- Identify how changes in international trade outcomes affect equilibrium outcomes for investment and interest rates

Reading and Exercises

- Textbook module 43
- Check out the pencasts, as the textbook's other modules are slightly different in modeling strategy
- **Canvas Quiz due Wednesday 11:59 PM**.
  Multiple-choice, 10 questions, unlimited attempts allowed, only best score counts
- **Homework/In-class Exercise due Friday 11:59 PM**. We will work together in class on Thursday.

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Savings Supply & Investment Demand
Shifts in Saving Supply
Shifts in Investment Demand

Relationship Between Saving and Investment
Saving Supply
Investment Demand
Equilibrium

Relationship Between Saving and Investment   3/ 22

- Expenditure definition of real GDP: $Y = C + I + G + X - M$
- Consumer budget constraint: $C + S = Y - T$
    - S: Private consumer savings
    - T: Taxes

- Alebra reveals that,

$$I = S + (T - G) + (M - X)$$

    - $I \equiv$ Investment demand
    - $S \equiv$ Private savings
    - $T - G \equiv S_g \equiv$ Government savings
    - $M - X \equiv S_{ROW} \equiv$ Rest-of-world savings

- Investment Demand = Saving Supply

$$I = S + S_g + S_{ROW}$$

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Interest Rate: Price of Loanable Funds

- The interest rate is a price received by providing loanable funds (saving money)

- The interest rate is a price paid by borrowers

- Interest rate is the price in the loanable funds market (saving supply, investment demand)

Law of Supply for Savings

- The higher is the interest rate, the greater is the quantity of saving supply

- Higher interest rate → greater private savings

- Higher interest rate → greater rest-of-world saving

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Private Saving Interest Rate

Private Savings Dependence on Interest Rate

All other things equal, the higher is the interest rate...

- The higher is the income earned from saving money,
- the greater is the incentive to save,
- the greater will be the quantity of private savings

Consumer Borrowing Dependence on Interest Rate

Private consumer savings can be negative,
so more borrowing ≡ less private saving

The higher is the interest rate...

- the more costly it is to borrow,
- the less consumers will borrow,
- or equivalently, the larger will be private savings

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Government Savings and Deficits & Interest Rate   6/ 22

Government Saving: $S_g = T - G$

- Government budget deficits: When government expenditures exceed tax revenue in a given period

- Government budget deficits equivalent to negative government saving

- $\uparrow$ Government budget deficit $\equiv \downarrow S_g$

Government saving / budget deficits do not automatically respond to interest rates

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Rest-of-World Savings & Interest Rate   7/ 22

Rest-of-World Saving

- $S_{ROW} \equiv M - X \equiv$ Trade deficit
- $S_{ROW} = -(X - M) =$ Negative of net exports
- S_{ROW} is net level of borrowing, net financial capital inflows into a country

Dependence on Interest Rate

When interest rate increases...

- Currency appreciates against major trading partners $\rightarrow$
- Currency more expensive $\rightarrow$ exports more expensive $\rightarrow \downarrow X$
- Currency more expensive $\rightarrow$ imports less expensive $\rightarrow \uparrow M$
- $\uparrow (M - X) \rightarrow \uparrow S_{ROW}$

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- $\uparrow (M - X) \rightarrow \uparrow S_{ROW}$

Savings Supply & Investment Demand
Shifts in Saving Supply
Shifts in Investment Demand

Relationship Between Saving and Investment
Saving Supply
Investment Demand
Equilibrium

Rest-of-World Savings & Interest Rate 7/ 22

Rest-of-World Saving

- $S_{ROW} \equiv M - X \equiv$ Trade deficit
- $S_{ROW} = -(X - M) =$ Negative of net exports
- S_{ROW} is net level of borrowing, net financial capital inflows into a country

Dependence on Interest Rate

When interest rate increases...

- Currency appreciates against major trading partners $\rightarrow$
- Currency more expensive $\rightarrow$ exports more expensive $\rightarrow \downarrow X$
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Rest-of-World Savings & Interest Rate   7/ 22

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Equilibrium

Saving Supply

Saving Supply

- $SS = S + S_g + S_{ROW} = S + (T - G) + (M - X)$

- Law of supply: An increase in interest rate leads to an increase in quantity of savings supplied

- A change in saving supply *based on a change in the interest rate* leads to a *change in quantity saving supplied*, which is a *movement* along the saving supply curve.

Saving Supply Curve

Savings Supply & Investment Demand
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Shifts in Investment Demand

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Investment Demand

Investment and Capital

- Investment: businesses' construction or purchases of capital equipment
- Capital: Physically manufactured goods used in the production of other goods and services

Dependence on Interest Rate

- Investment typically involves large expenditures
- If financed with borrowing:
  - ↑ interest rate → more costly to borrow → ↓ investment
- If financed with accumulated savings:
  - ↑ interest rate → greater the income to earned keeping funds in financial investments → greater is the opportunity cost of investment → ↓ investment

- **Law of Demand for Investment**: The higher is the interest rate, the lower is the quantity of investment demand

Savings Supply & Investment Demand
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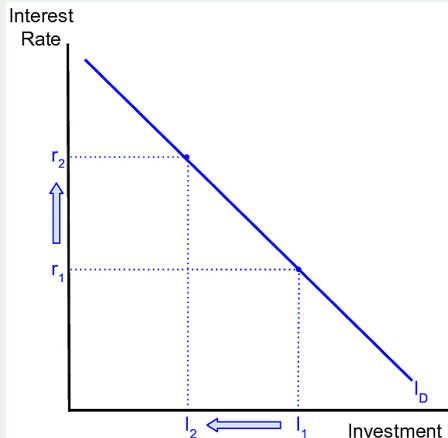Savings Supply & Investment Demand
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Relationship Between Saving and Investment
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Investment Demand   9/ 22

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Investment Demand

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- Law of demand: An increase in interest rate leads to a decrease in quantity of investment demanded.

- A change in investment decisions *based on a change in the interest rate* leads to a *change in quantity demanded*, which is a *movement* along the demand curve.

Investment Demand Curve

Savings Supply & Investment Demand
Shifts in Saving Supply
Shifts in Investment Demand

Relationship Between Saving and Investment
Saving Supply
Investment Demand
Equilibrium

Equilibrium

Equilibrium Definition

- The **equilibrium interest rate** is the interest rate where the quantity of investment demanded is equal to the quantity of saving supply

- The **equilibrium level of investment** is the corresponding quantity of investment = quantity of savings supply

Graphical Equilibrium

Savings Supply & Investment Demand
Shifts in Saving Supply
Shifts in Investment Demand

Illustrating Shifts in Saving Supply
Private Saving
Government Saving
Rest of World Saving

Shifts in Saving Supply

Shifts in Whole Supply Curve

- When something *besides the interest rate* affects saving supply, we say there is a *change or shift in saving supply*.
- Something that **increases** saving supply shifts the saving supply curve to the **right**
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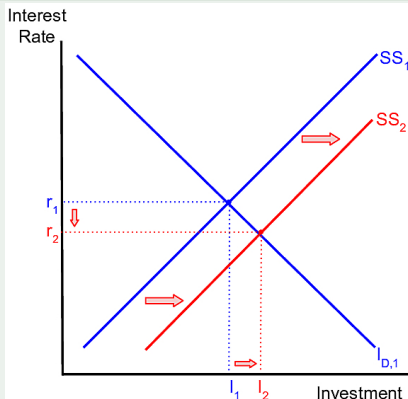
Shifts in Saving Supply

Savings Supply & Investment Demand
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Savings Supply & Investment Demand
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Illustrating Shifts in Saving Supply
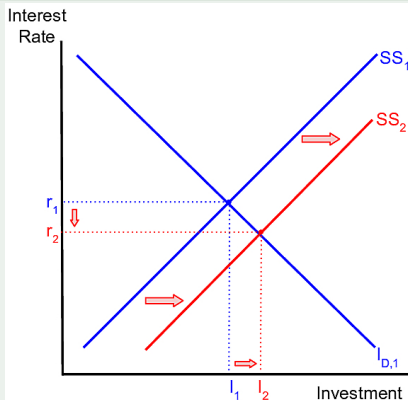**Private Saving**
Government Saving
Rest of World Saving

Increase in Private Saving

Mechanism

- Suppose consumers decide it is better for their long-run financial health to increase the fraction of the income they save
- Saving supply shifts to the right
- Equilibrium interest rate decreases
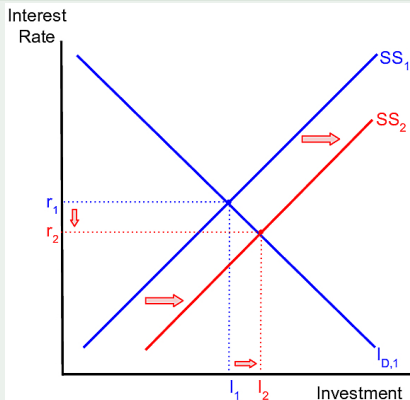- Equilibrium quantity of investment increases

Graphical Equilibrium

Savings Supply & Investment Demand
Shifts in Saving Supply
Shifts in Investment Demand

Illustrating Shifts in Saving Supply
Private Saving
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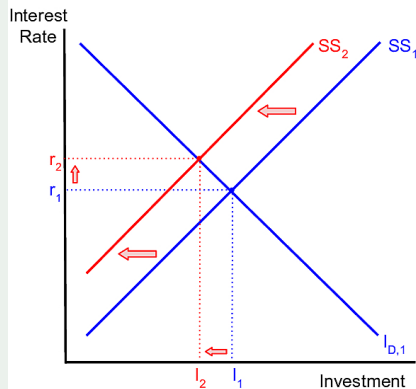- Equilibrium quantity of investment increases

Graphical Equilibrium

Savings Supply & Investment Demand
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Illustrating Shifts in Saving Supply
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Government Saving
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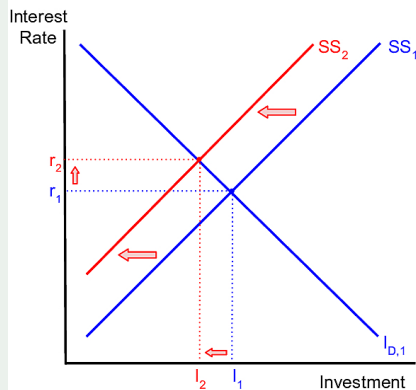- Equilibrium quantity of investment increases

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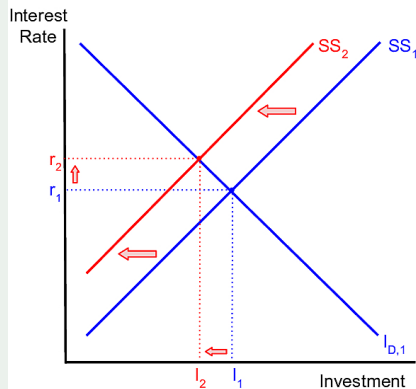- Equilibrium quantity of investment increases

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Savings Supply & Investment Demand
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Shifts in Investment Demand

Illustrating Shifts in Saving Supply
Private Saving
Government Saving
Rest of World Saving

Increase in Government Budget Deficits

Mechanism

- Suppose government increases expenditures without increasing taxes, leading to more government borrowing ≡ larger government budget deficits
- Saving supply shifts to the left
- Equilibrium interest rate increases
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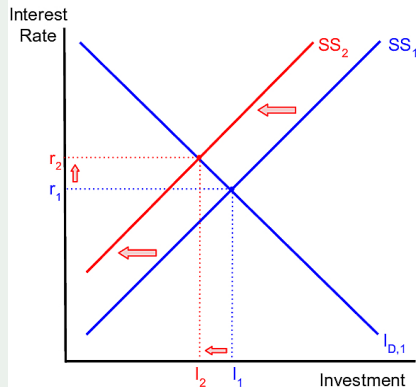
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Savings Supply & Investment Demand
Shifts in Saving Supply
Shifts in Investment Demand

Illustrating Shifts in Saving Supply
Private Saving
Government Saving
Rest of World Saving

Increase in Government Budget Deficits   14/ 22

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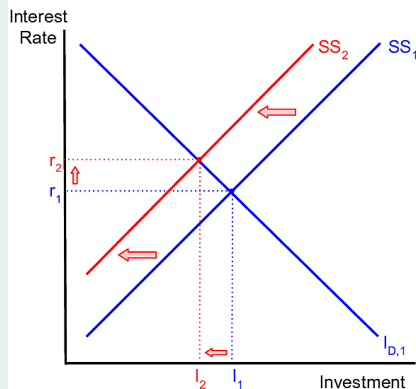- Equilibrium quantity of investment decreases

Graphical Equilibrium

Savings Supply & Investment Demand
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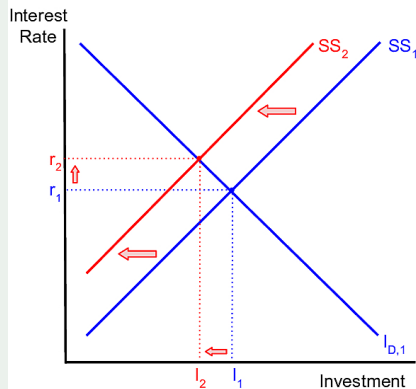
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Illustrating Shifts in Saving Supply
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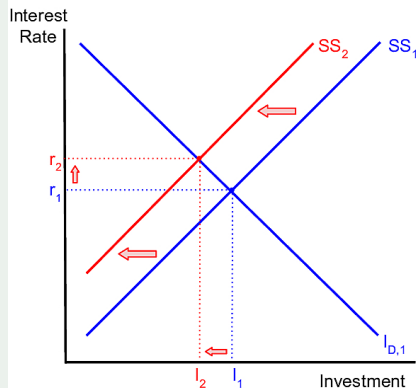- Equilibrium quantity of investment decreases

Graphical Equilibrium

Savings Supply & Investment Demand
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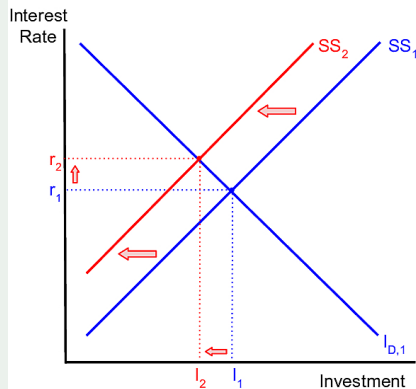- Equilibrium quantity of investment decreases

Graphical Equilibrium

Savings Supply & Investment Demand
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Illustrating Shifts in Saving Supply
Private Saving
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Rest of World Saving

Increase in Trade Deficits: Example 1

Mechanism

- Whenever trade deficits decrease → Saving supply decreases
- S_{ROW} = Trade deficit $= M - X$
- Suppose foreign incomes increase, leading to an increase in exports
- Saving supply shifts to the left
- Equilibrium interest rate increases
- Equilibrium quantity of investment decreases

Graphical Equilibrium

Savings Supply & Investment Demand
Shifts in Saving Supply
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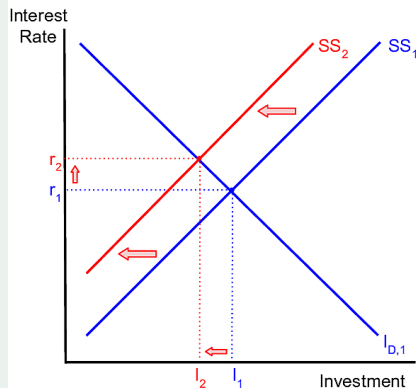- Equilibrium quantity of investment decreases

Graphical Equilibrium

Savings Supply & Investment Demand
Shifts in Saving Supply
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Illustrating Shifts in Saving Supply
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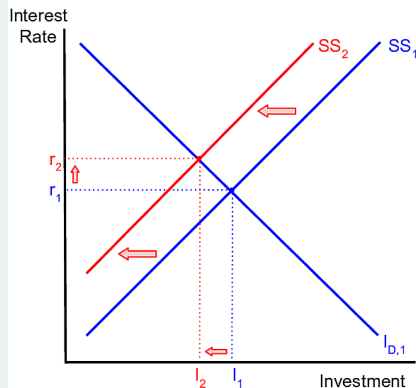
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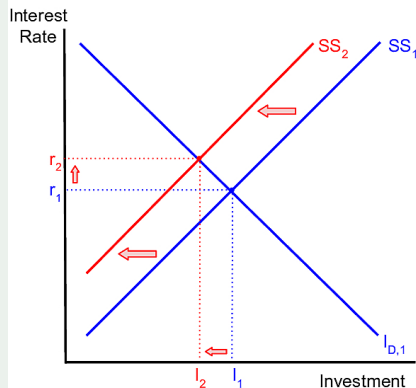- Equilibrium quantity of investment decreases

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Savings Supply & Investment Demand
Shifts in Saving Supply
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Illustrating Shifts in Saving Supply
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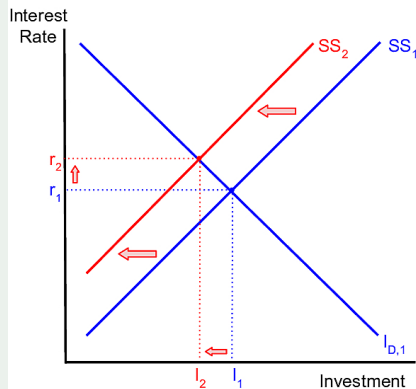- Equilibrium quantity of investment decreases

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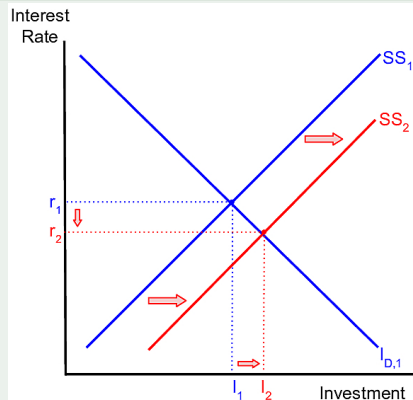
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Savings Supply & Investment Demand
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Increase in Trade Deficits: Example 2

Mechanism

- Trade deficit =
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- Suppose currency appreciates leading to an increase in imports, decrease in exports
- Saving supply shifts to the right
- Equilibrium interest rate decreases
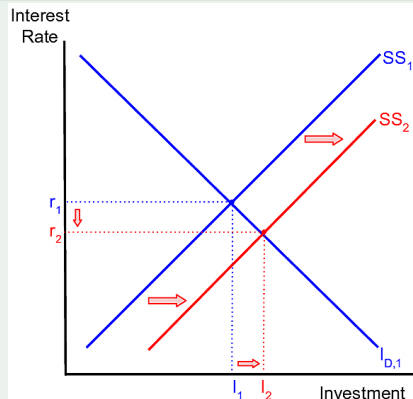- Equilibrium quantity of investment increases

Graphical Equilibrium

Savings Supply & Investment Demand
Shifts in Saving Supply
Shifts in Investment Demand

Illustrating Shifts in Saving Supply
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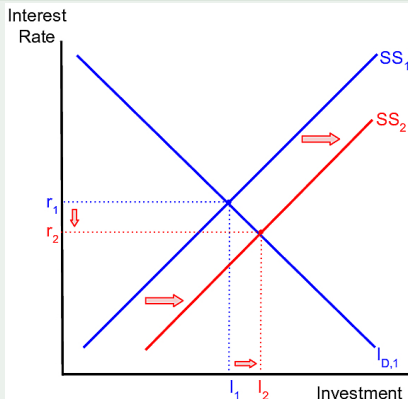
Graphical Equilibrium

Savings Supply & Investment Demand
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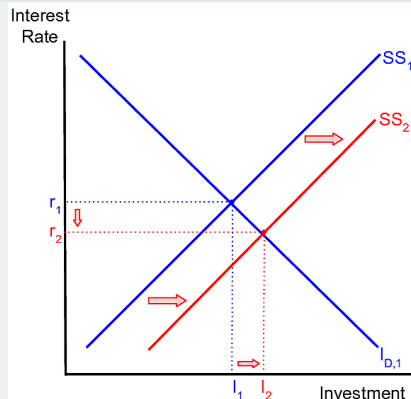- Equilibrium quantity of investment increases

Graphical Equilibrium

Savings Supply & Investment Demand
Shifts in Saving Supply
Shifts in Investment Demand

Illustrating Shifts in Saving Supply
Private Saving
Government Saving
Rest of World Saving

Increase in Trade Deficits: Example 2

16/ 22

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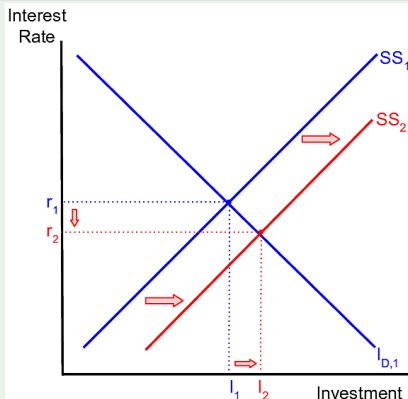- Equilibrium quantity of investment increases

Graphical Equilibrium

Savings Supply & Investment Demand
Shifts in Saving Supply
Shifts in Investment Demand

Illustrating Shifts in Saving Supply
Private Saving
Government Saving
Rest of World Saving

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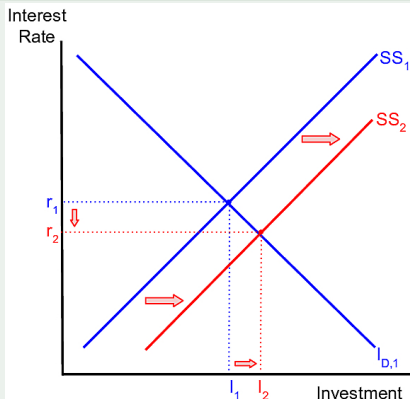- Equilibrium quantity of investment increases

Graphical Equilibrium

Savings Supply & Investment Demand
Shifts in Saving Supply
Shifts in Investment Demand

Illustrating Shifts in Saving Supply
Private Saving
Government Saving
Rest of World Saving

Increase in Trade Deficits: Example 2 16/ 22

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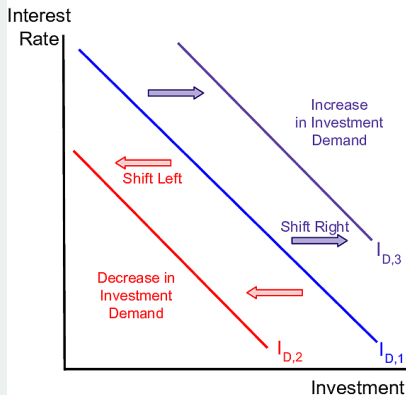- Equilibrium quantity of investment increases

Graphical Equilibrium

Savings Supply & Investment Demand
Shifts in Saving Supply
Shifts in Investment Demand

Illustrating Shifts in Investment Demand
Change in Businesses' Economic Outlook
Improvement in Technology
Destruction of Capital Stock

Shifts in Investment Demand

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- Something that **increases** investment demand shifts the investment demand curve to the **right**
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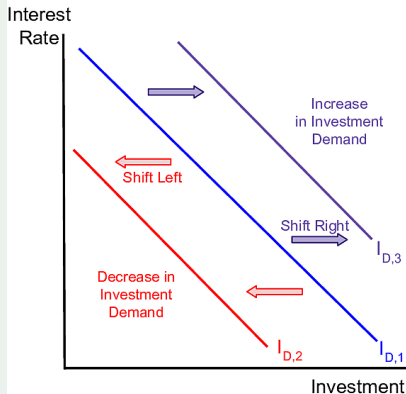
Graphical Illustration

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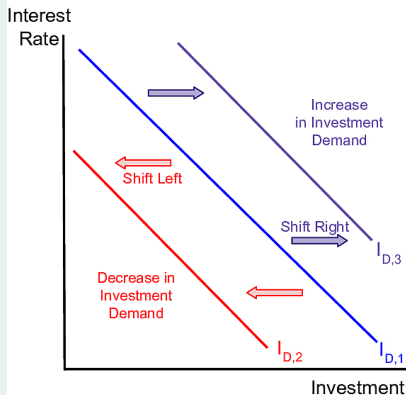
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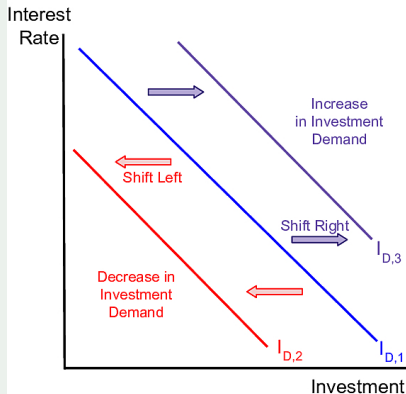
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Investment Demand Factors   18/ 22

Expectations of Future Profitability

- Investment typically involves large purchases of capital that will be used for a long time into the future
- Investment demand depends on *expectations of future sales and future profitability*
- Investment demand may depend on current demand for goods and services, if businesses expect current trends to continue

Marginal Product of Capital

- Investment demand also depends on future marginal product of capital
- **Marginal product of capital:** Additional production possible from one more unit of capital
- **Law of Diminishing Returns:** As capital stock increases, marginal product of capital decreases

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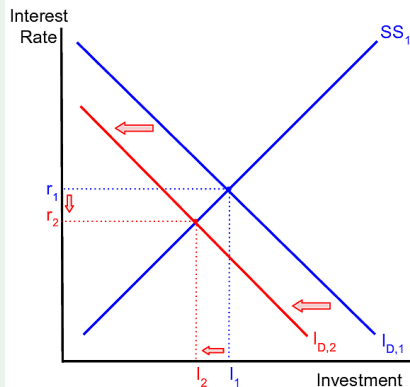
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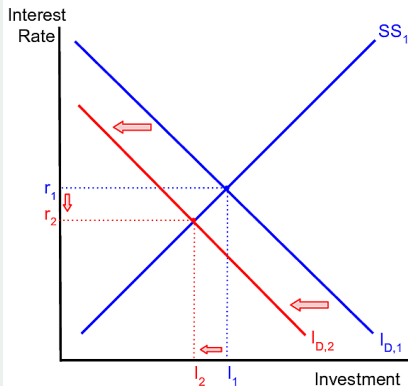
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Mechanism

- Suppose businesses are pessimistic about future sales
- Investment demand shifts to the left
- Equilibrium interest rate decreases
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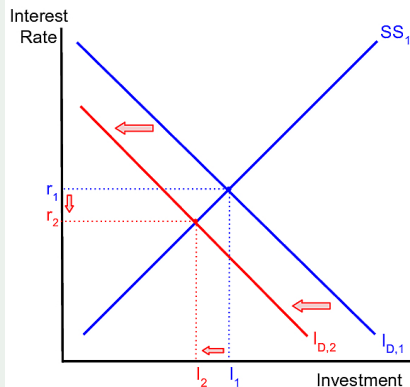
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Businesses' Economic Outlook

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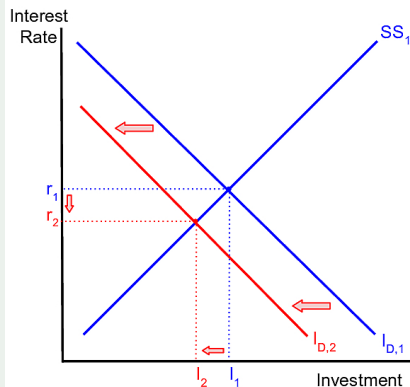
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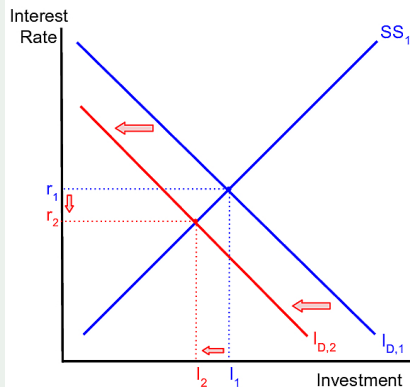
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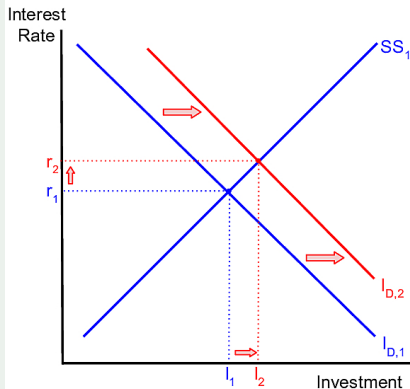
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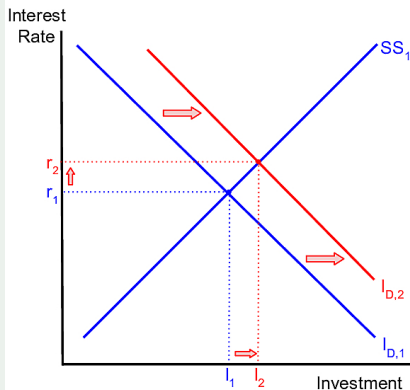
Improvement in Technology

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- Suppose improvements in technology make workers and capital more productive
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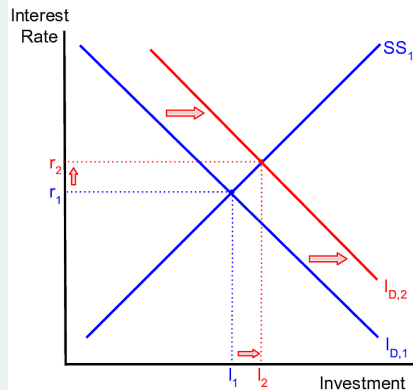
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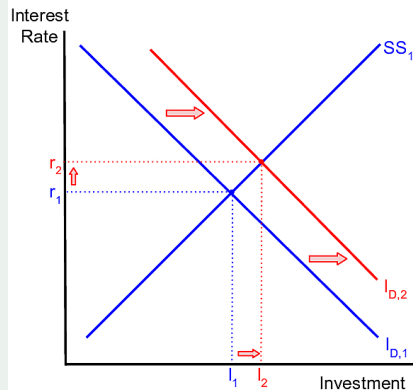- Equilibrium quantity of investment increases

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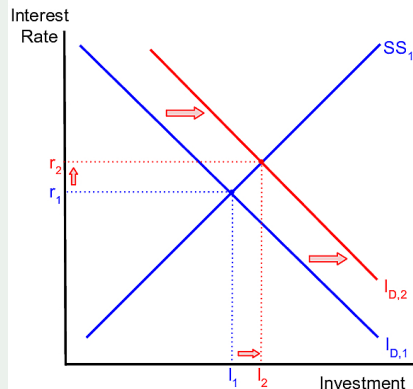- Equilibrium quantity of investment increases

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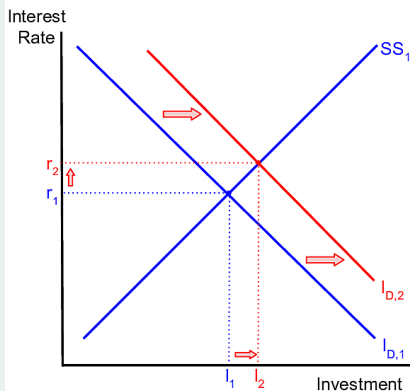- Equilibrium quantity of investment increases

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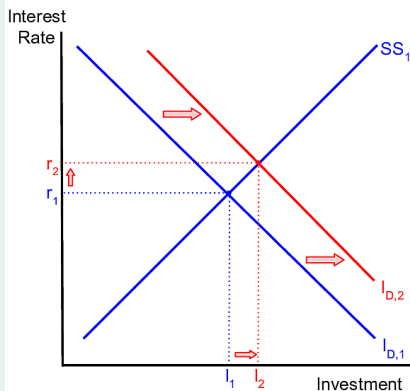
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Mechanism

- Suppose a hurricane destroys capital stock
- Decrease in capital $\rightarrow$ increase in MP_K
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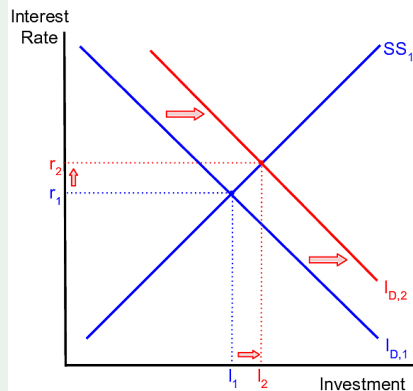- Equilibrium quantity of investment increases

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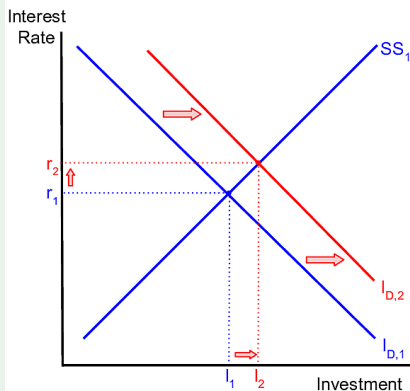- Equilibrium quantity of investment increases

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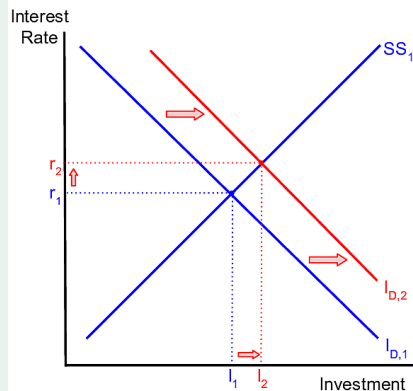- Equilibrium quantity of investment increases

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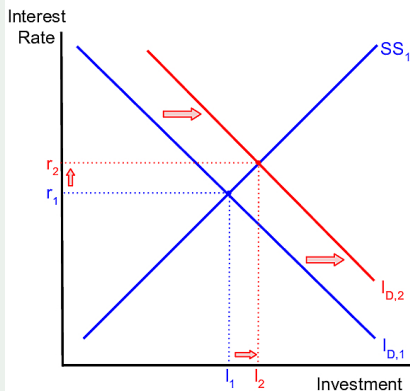- Equilibrium quantity of investment increases

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- Check out the pencasts, as the textbook's other modules are slightly different in modeling strategy
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  Multiple-choice, 10 questions, unlimited attempts allowed, only best score counts
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