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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Relationship Between Saving and Investment

- 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

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 $\rightarrow$ greater private savings
- Higher interest rate $\rightarrow$ 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 $\equiv$ less private saving

The higher is the interest rate...

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

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Government Savings and Deficits & Interest Rate

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

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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Saving Supply

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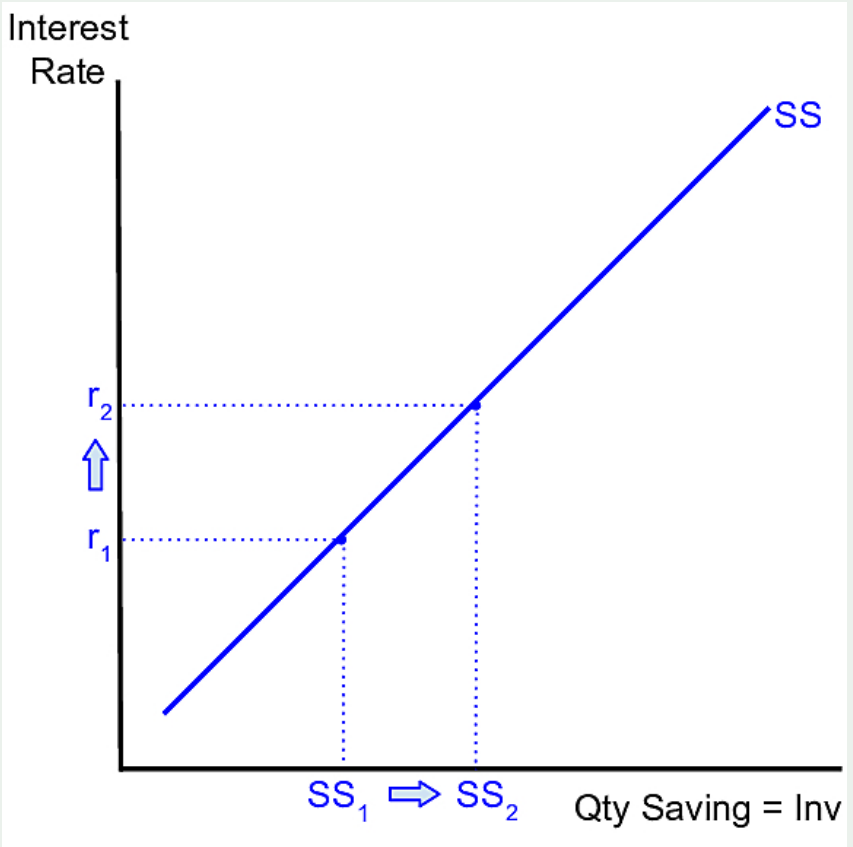
- $SS = S + S_g + S_{ROW} = S + (T - G) + (M - X)$
- Law of supply: An increase in interest rate leads to an increase in quantity of savings supplied
- A change in saving supply *based on a change in the interest rate* leads to a *change in quantity saving supplied*, which is a *movement* along the saving supply curve

Saving Supply Curve



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

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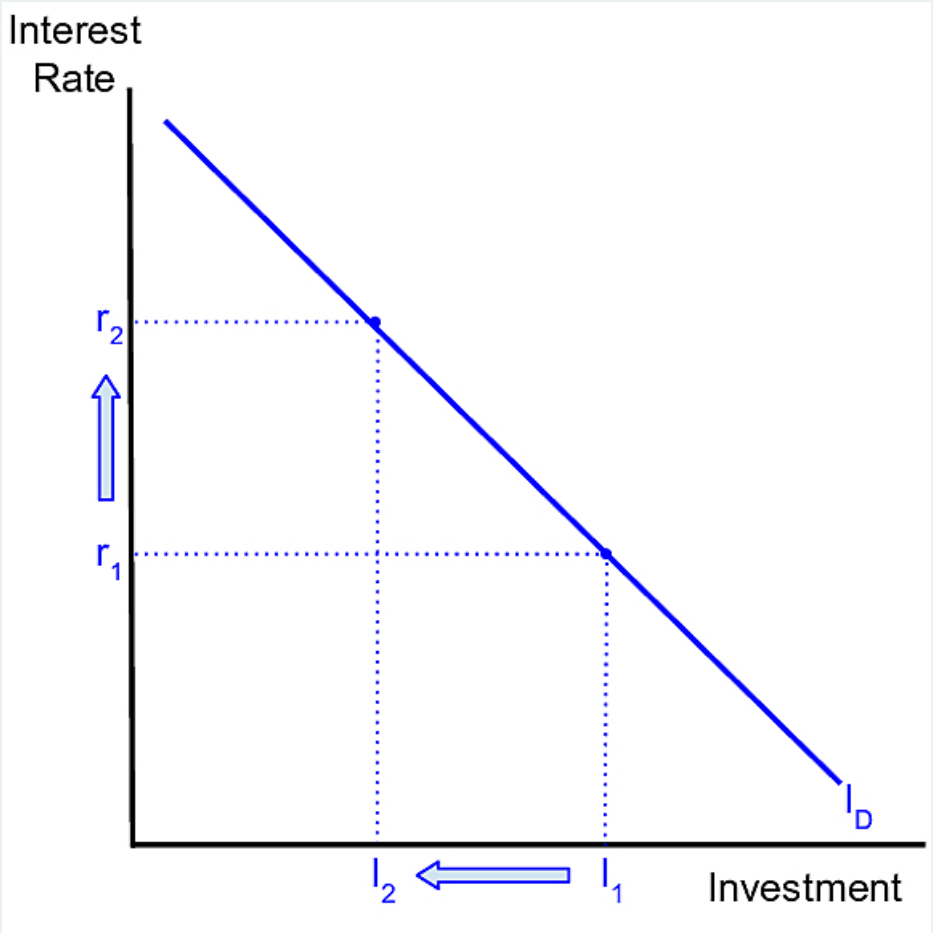
- Law of demand: An increase in interest rate leads to a decrease in quantity of investment demanded.
- A change in investment decisions *based on a change in the interest rate* leads to a *change in quantity demanded*, which is a *movement* along the demand curve.

Investment Demand Curve

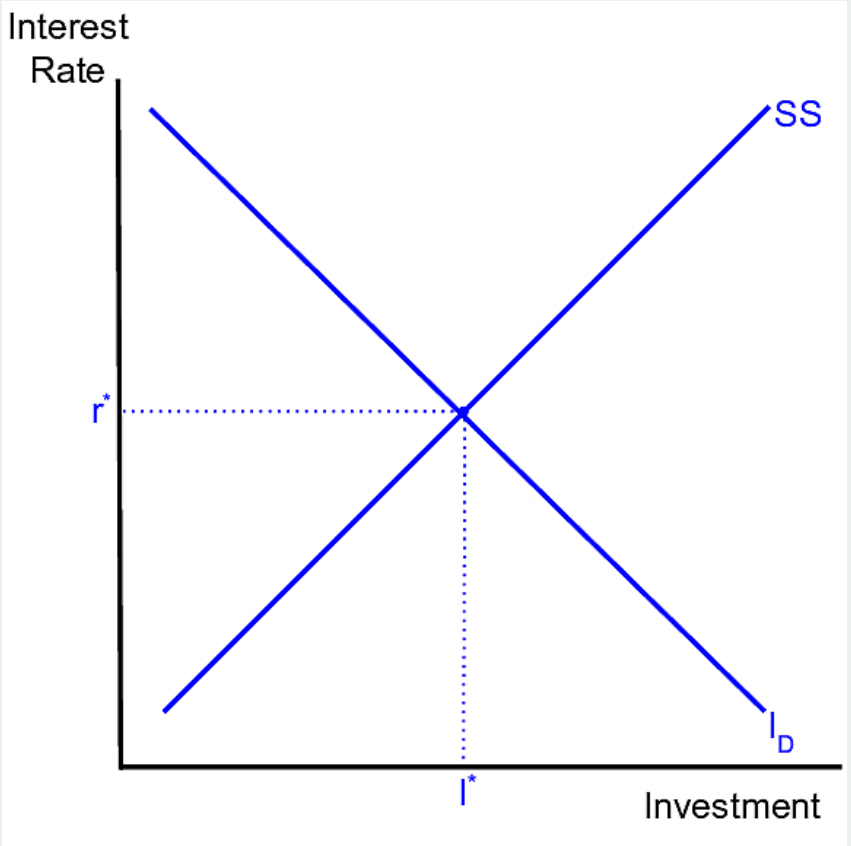


Equilibrium

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



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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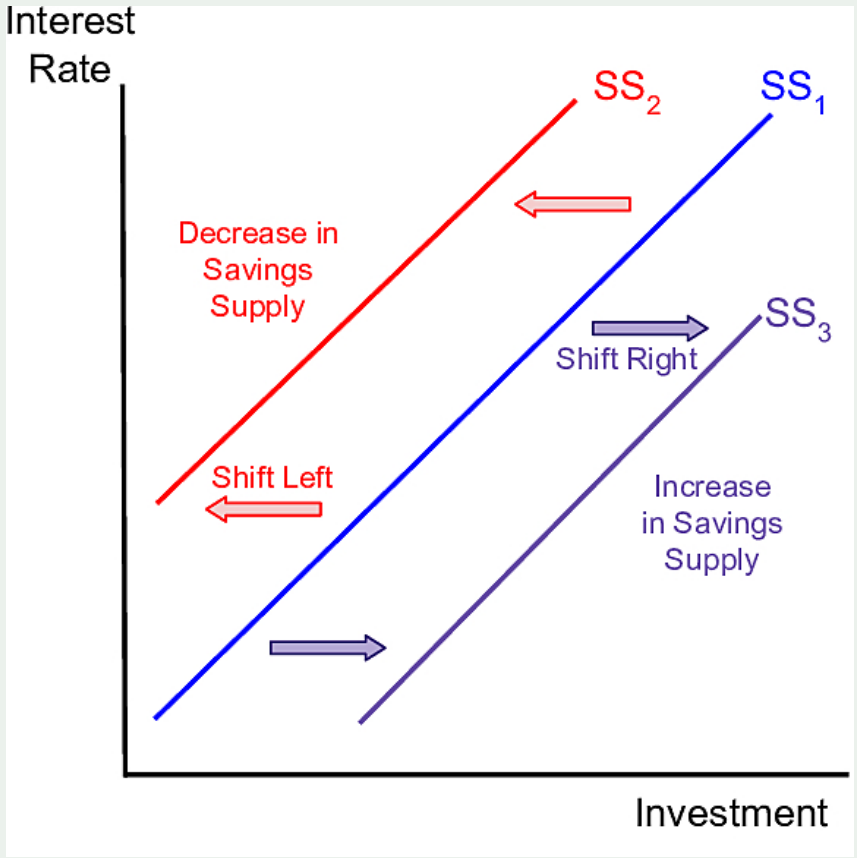

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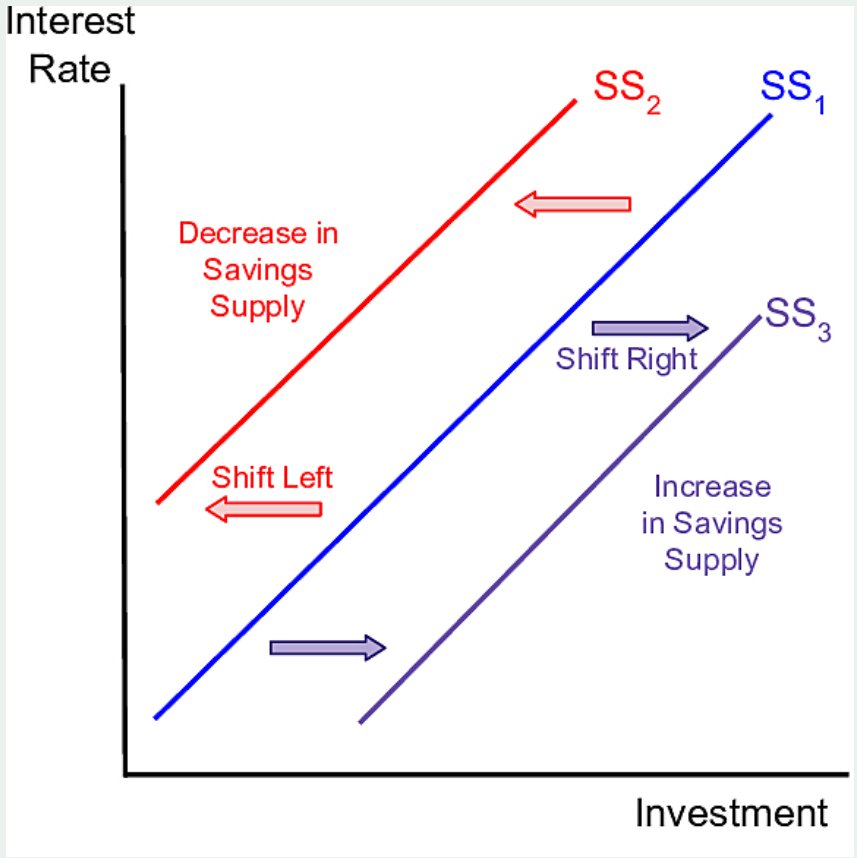

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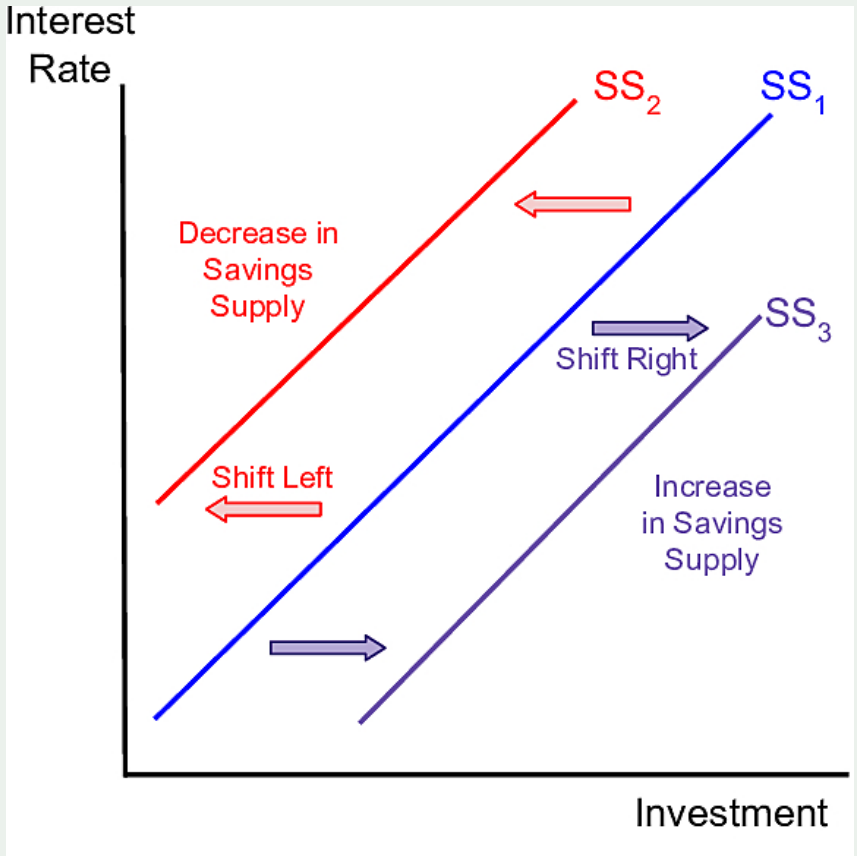

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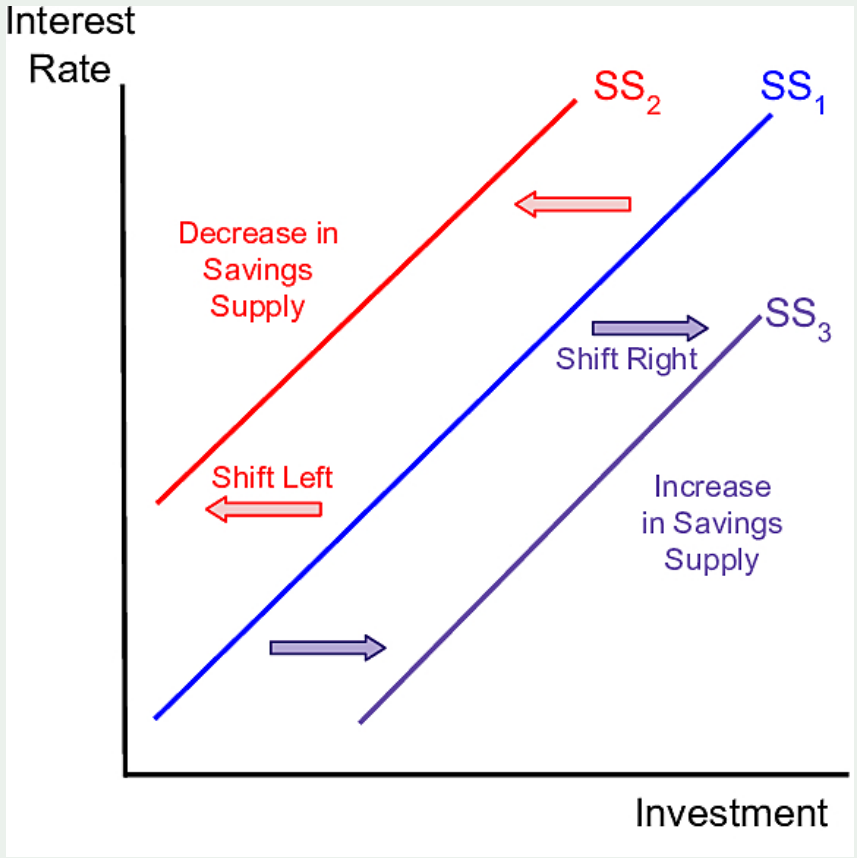

Increase in Private Saving

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

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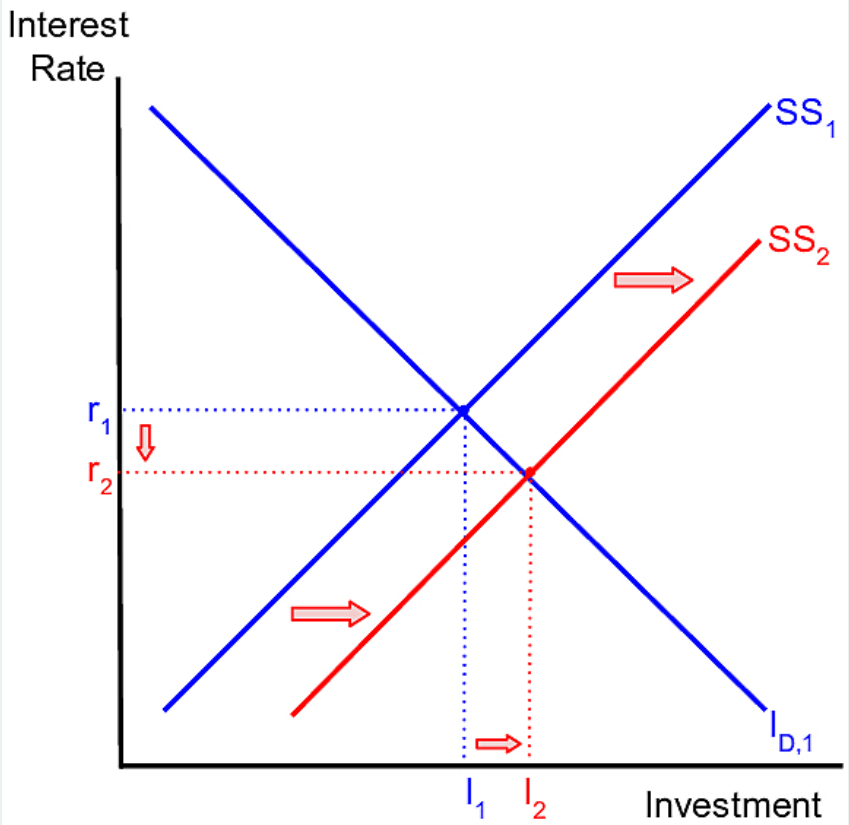

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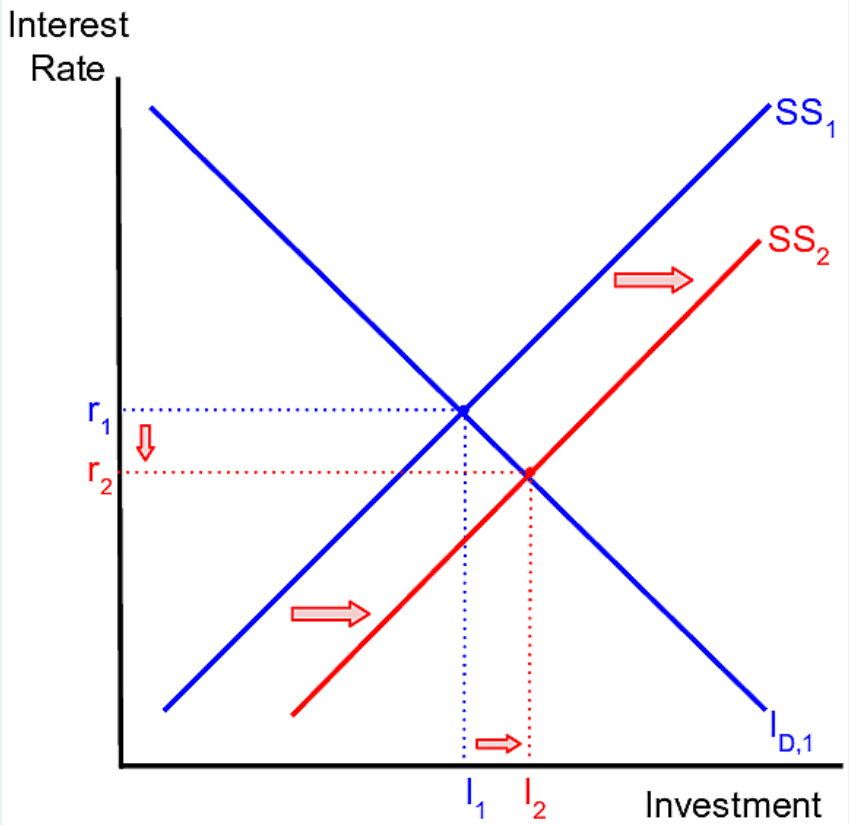

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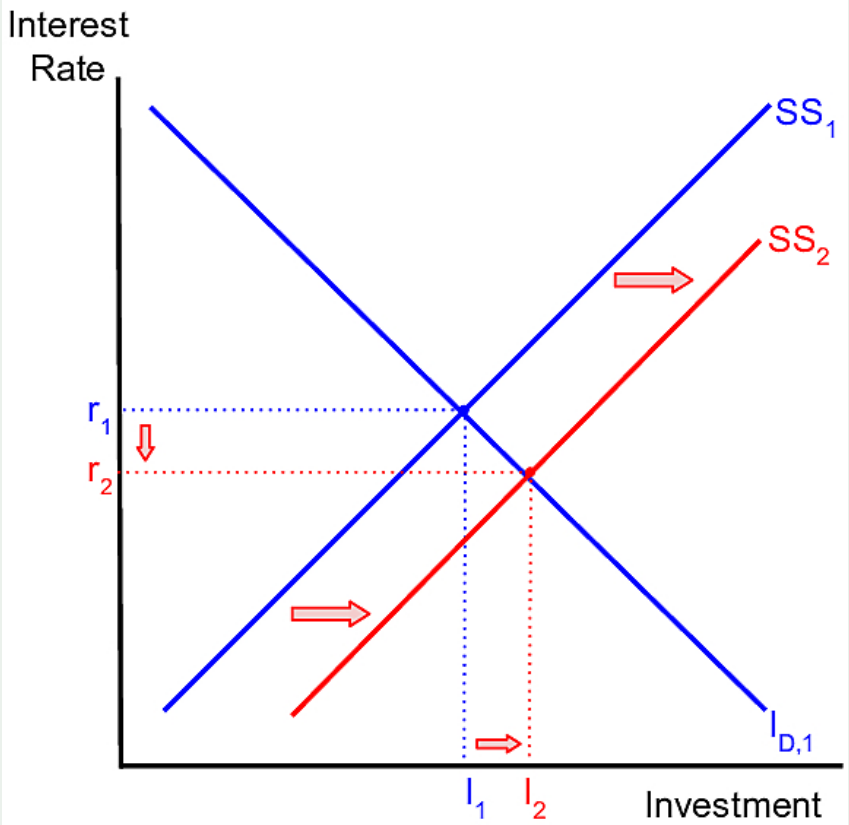

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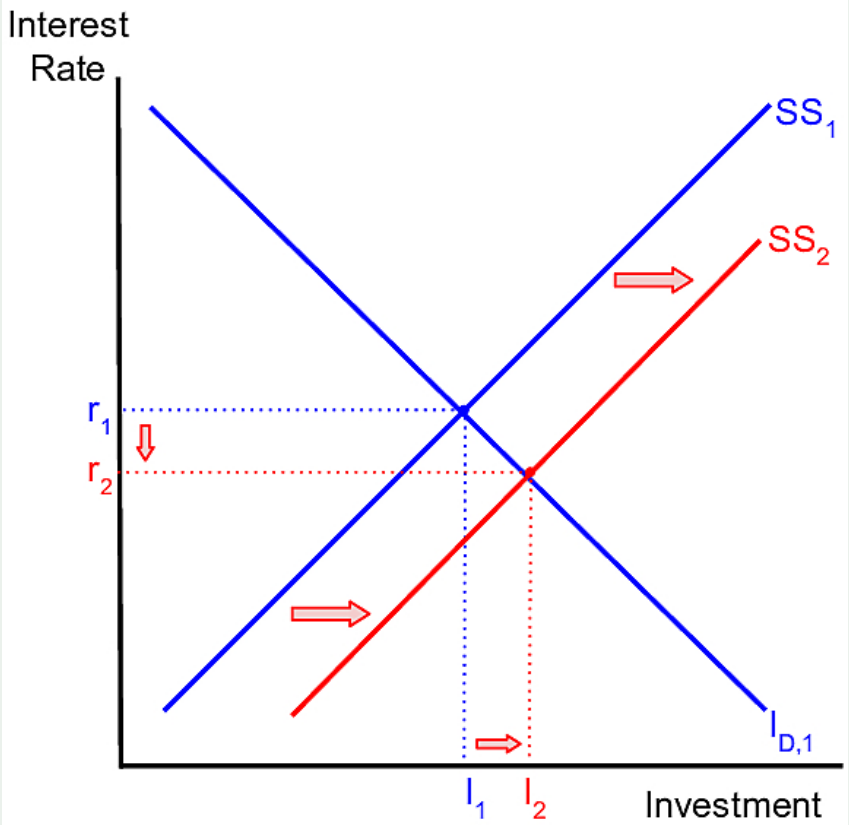

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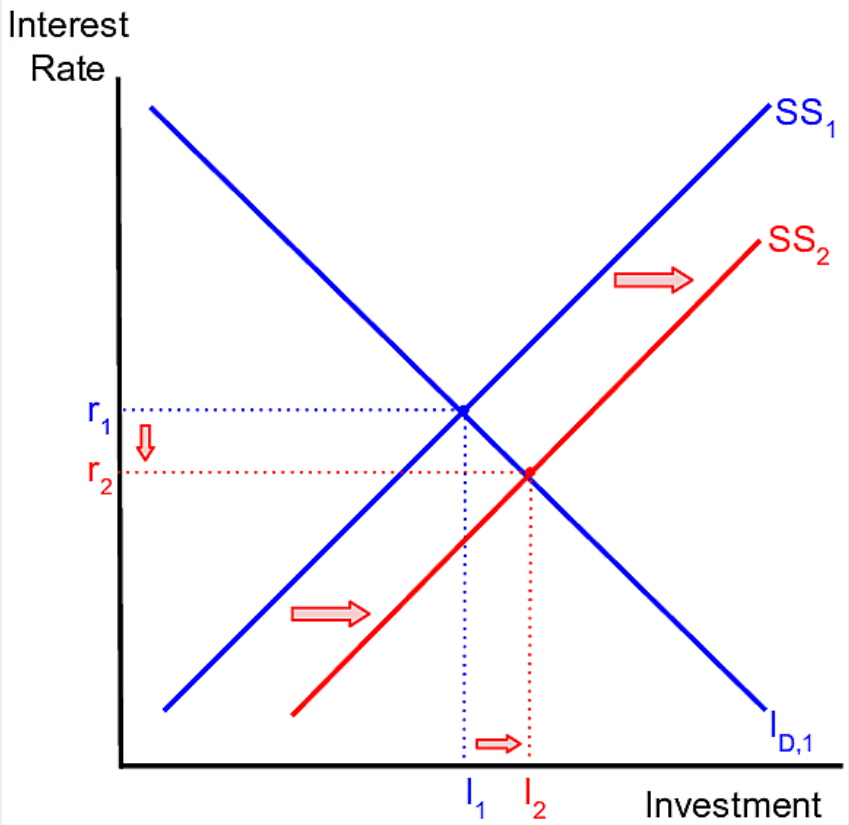

Increase in Government Budget Deficits

Mechanism

- Suppose government increases expenditures without increasing taxes, leading to more government borrowing $\equiv$ larger government budget deficits
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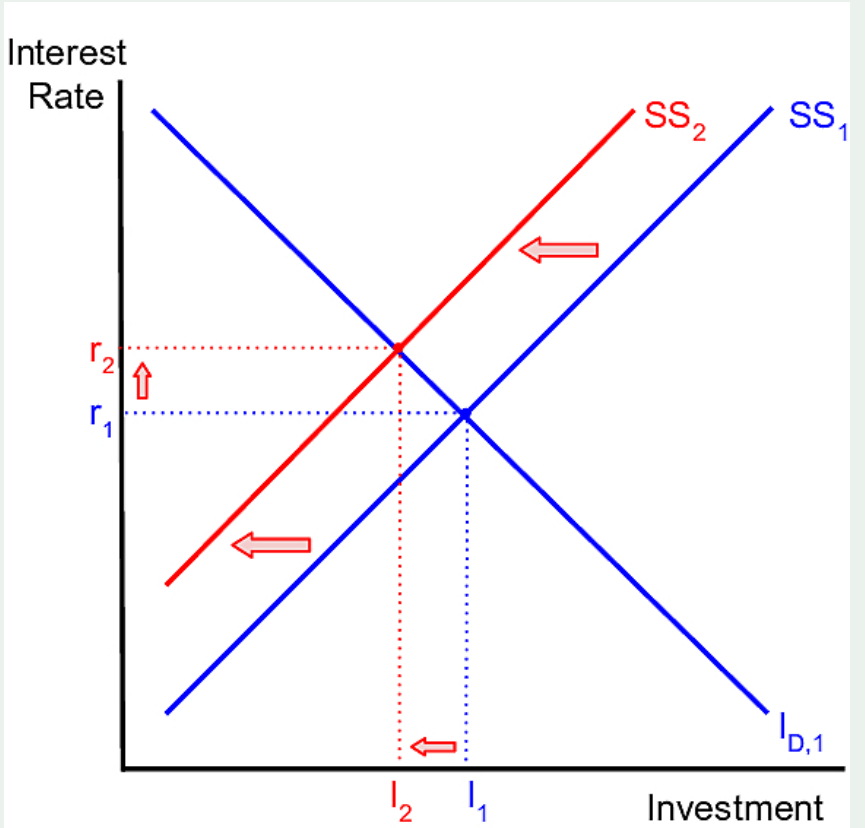

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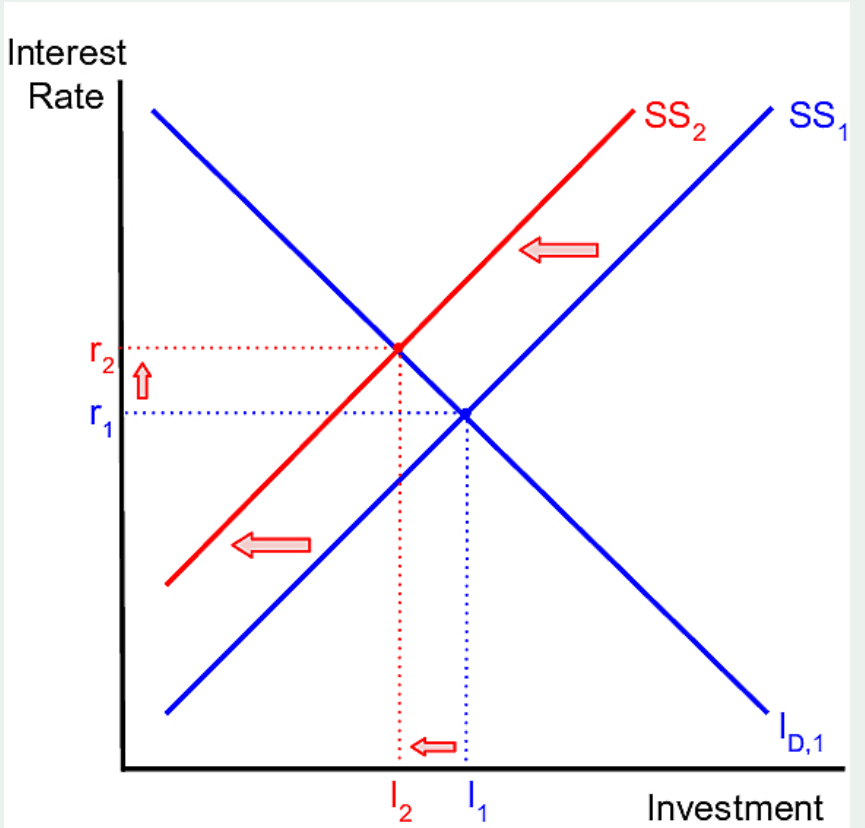

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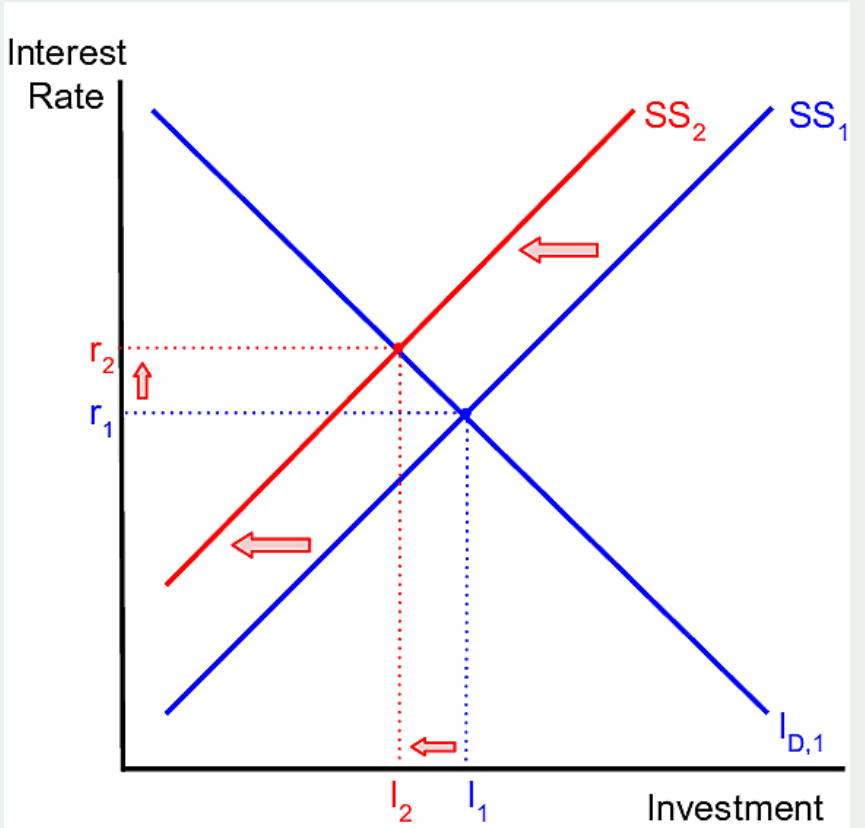

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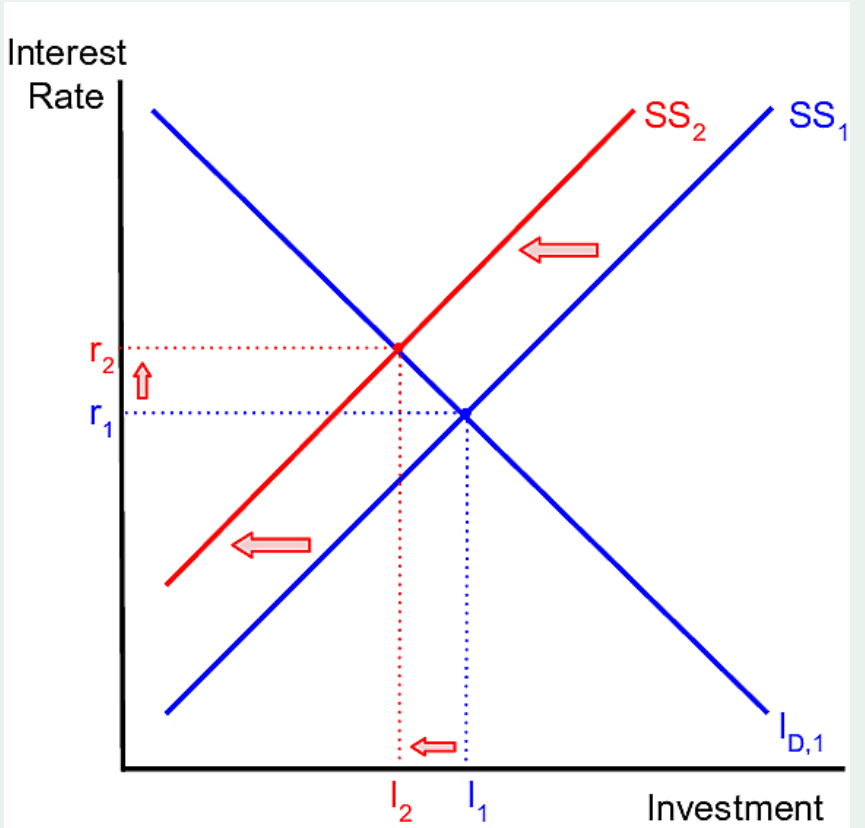

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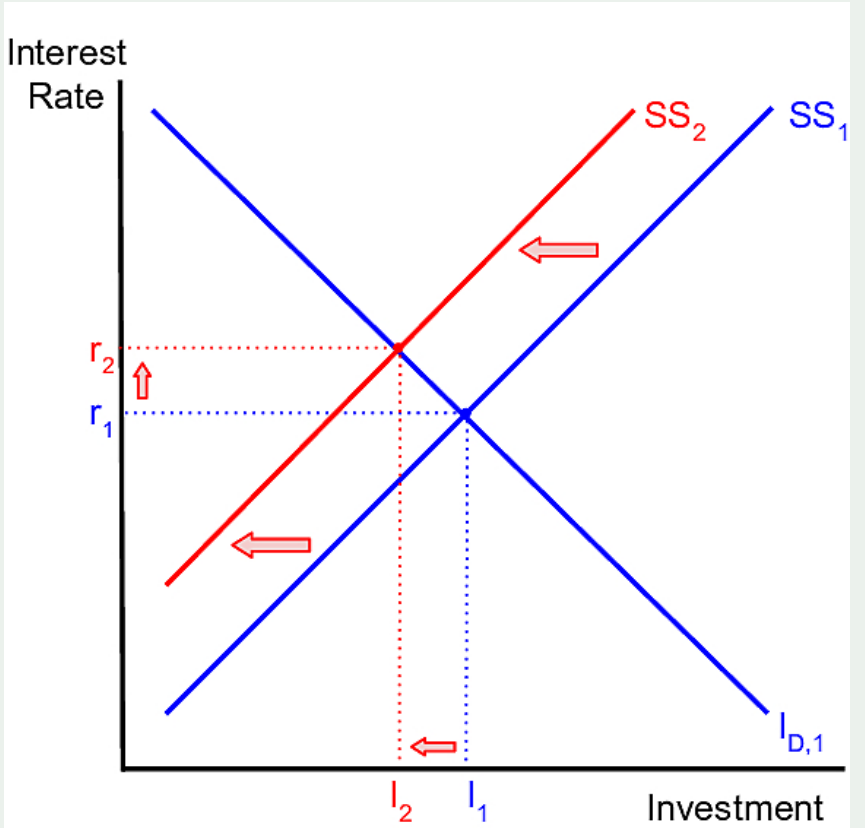

Increase in Trade Deficits: Example 1

Mechanism

- Whenever trade deficits decrease $\rightarrow$ Saving supply decreases
- S_{ROW} = Trade deficit $= M - X$
- Suppose foreign incomes increase, leading to an increase in exports
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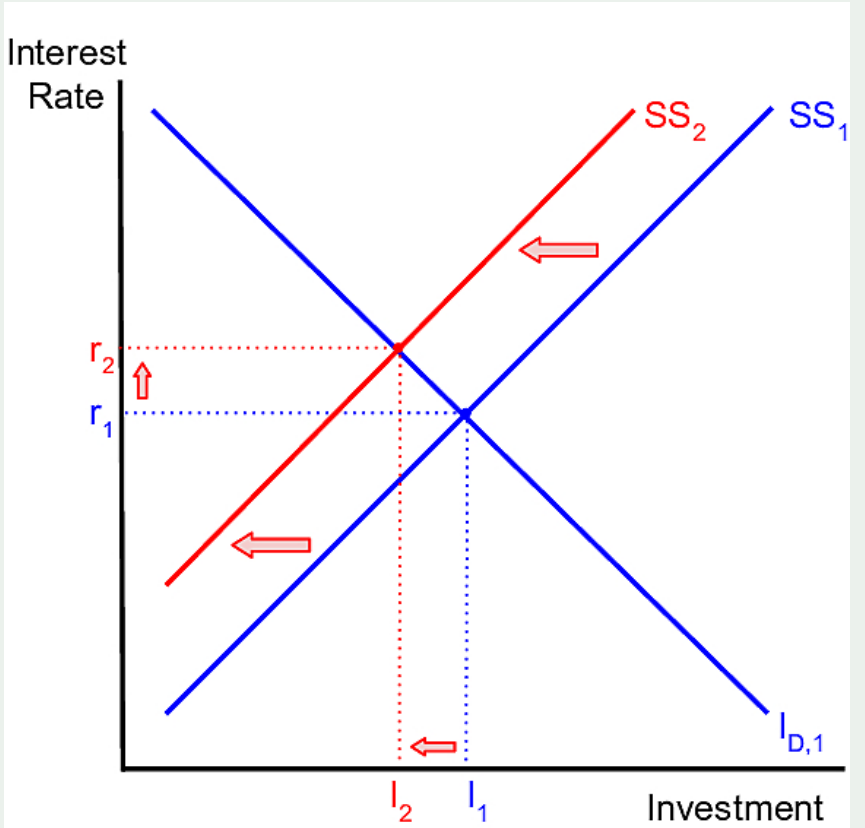

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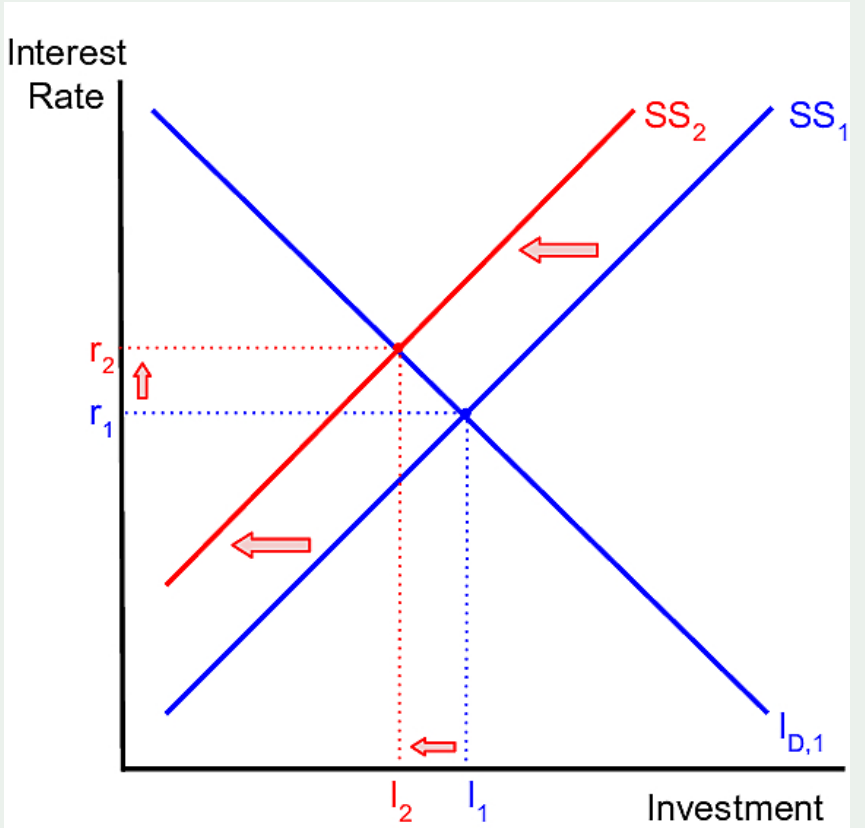

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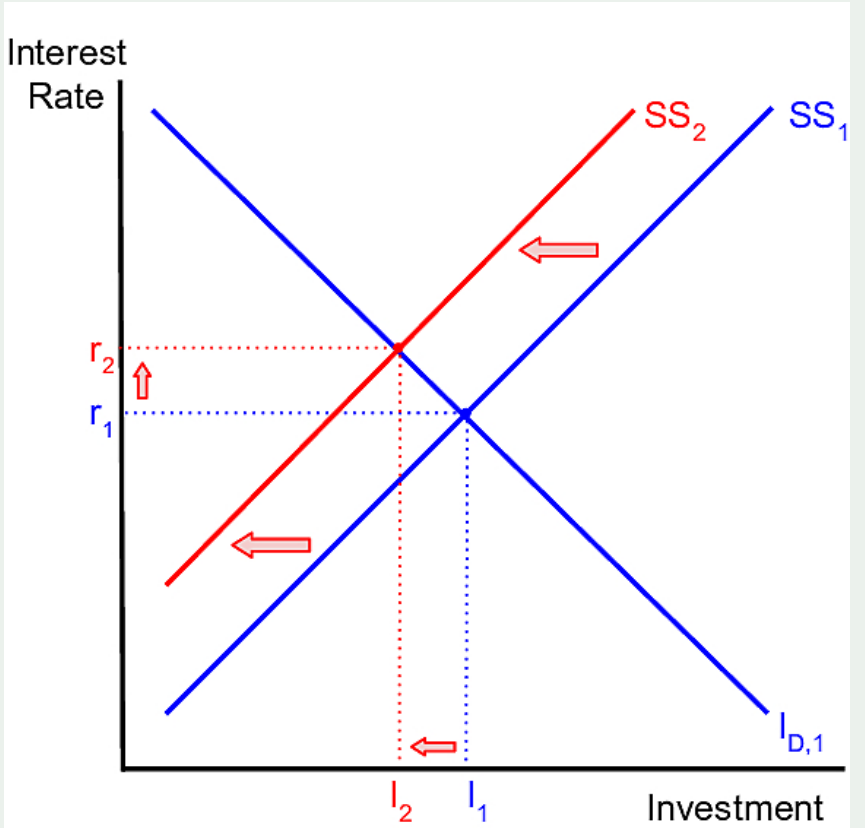

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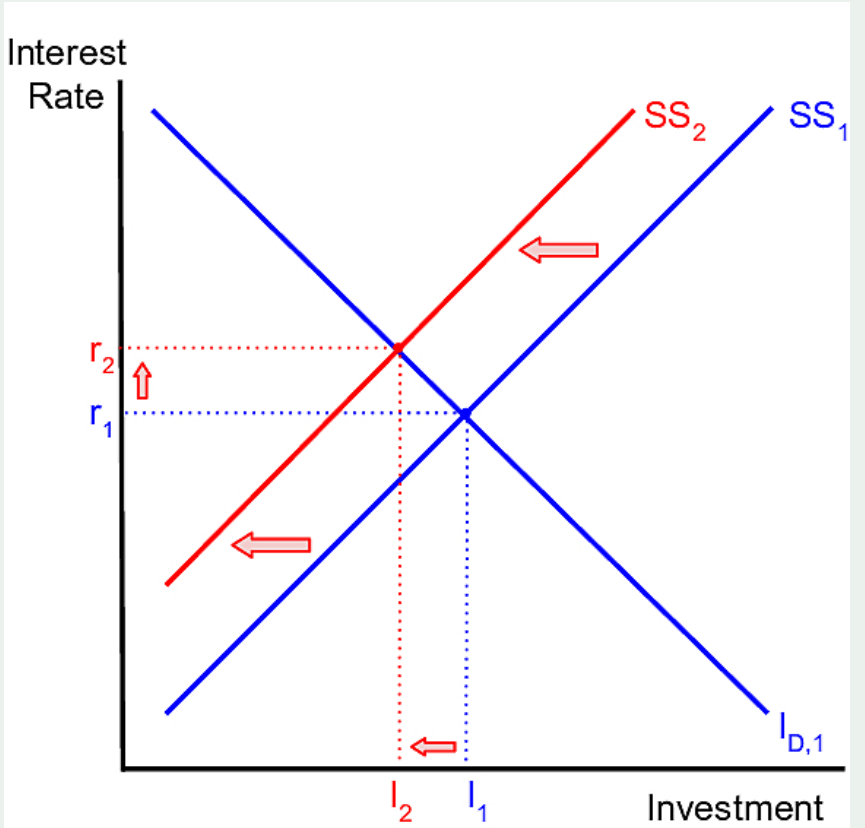

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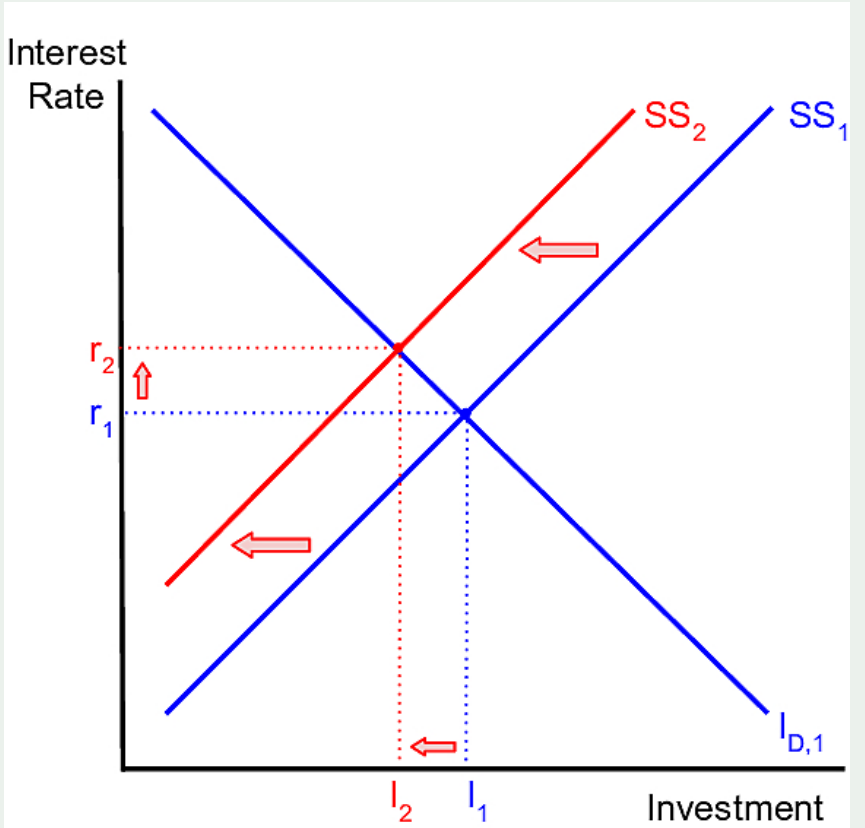

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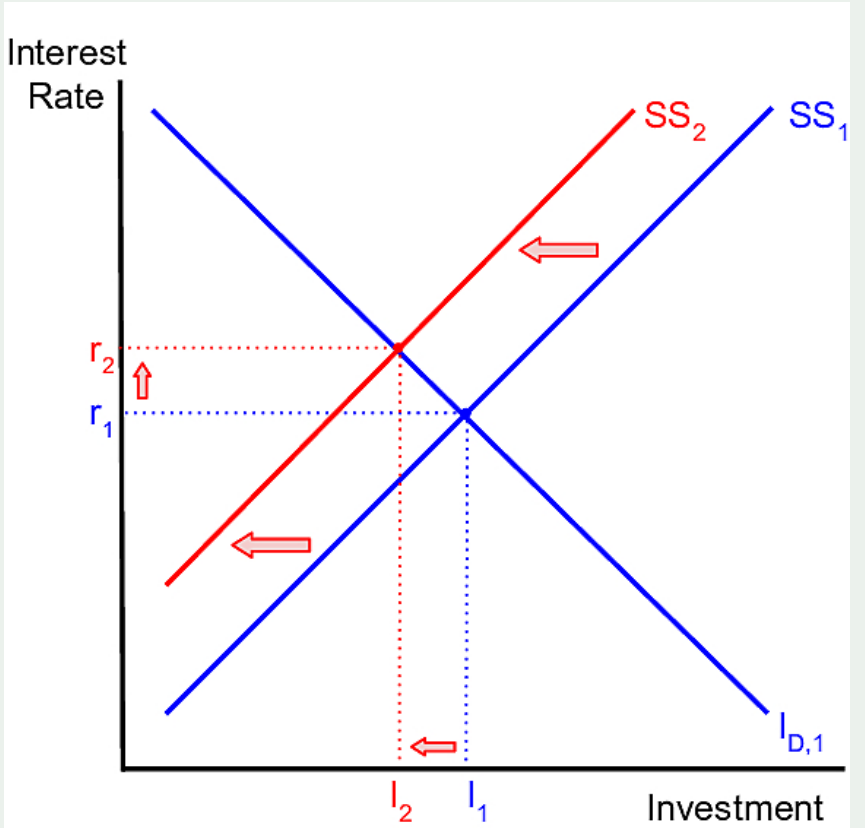

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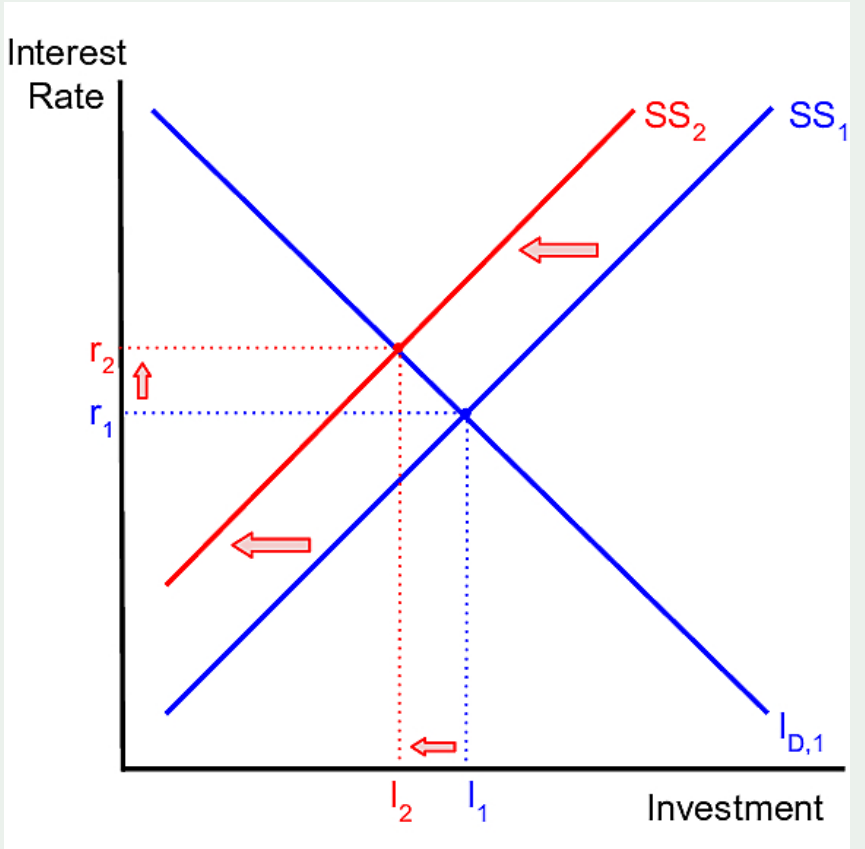

Increase in Trade Deficits: Example 2

Mechanism

- Trade deficit = $S_{ROW} = M - X$
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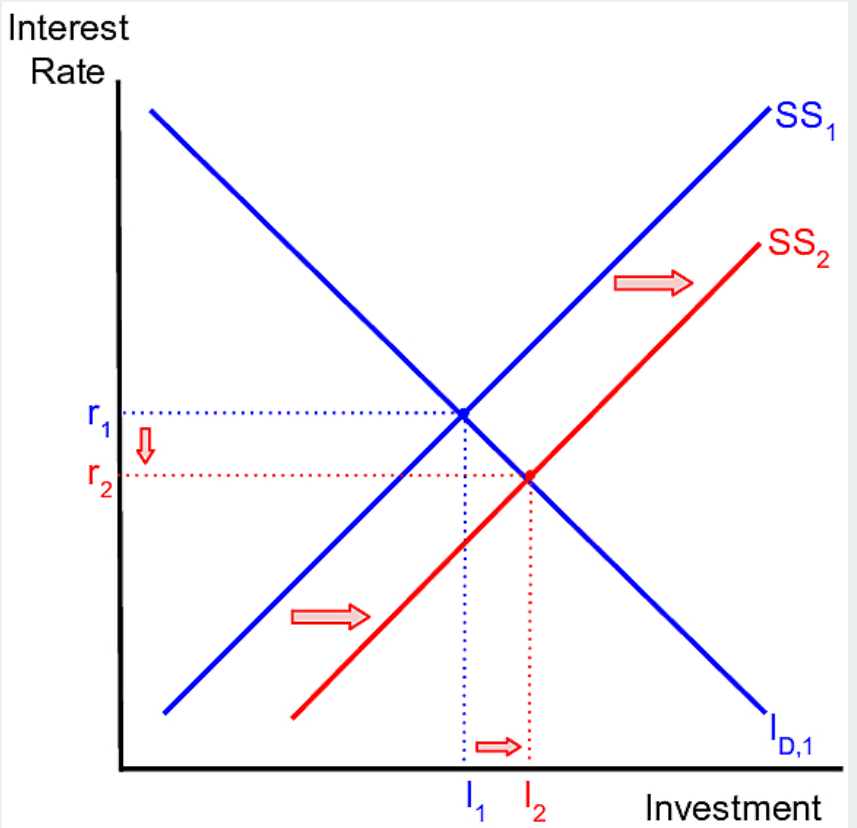

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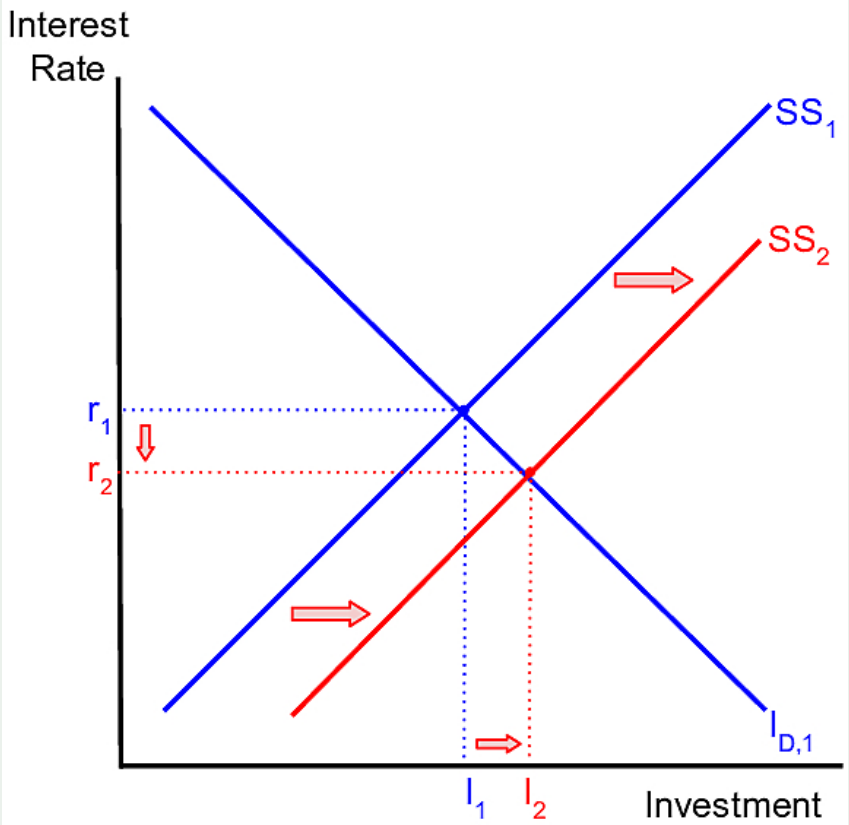

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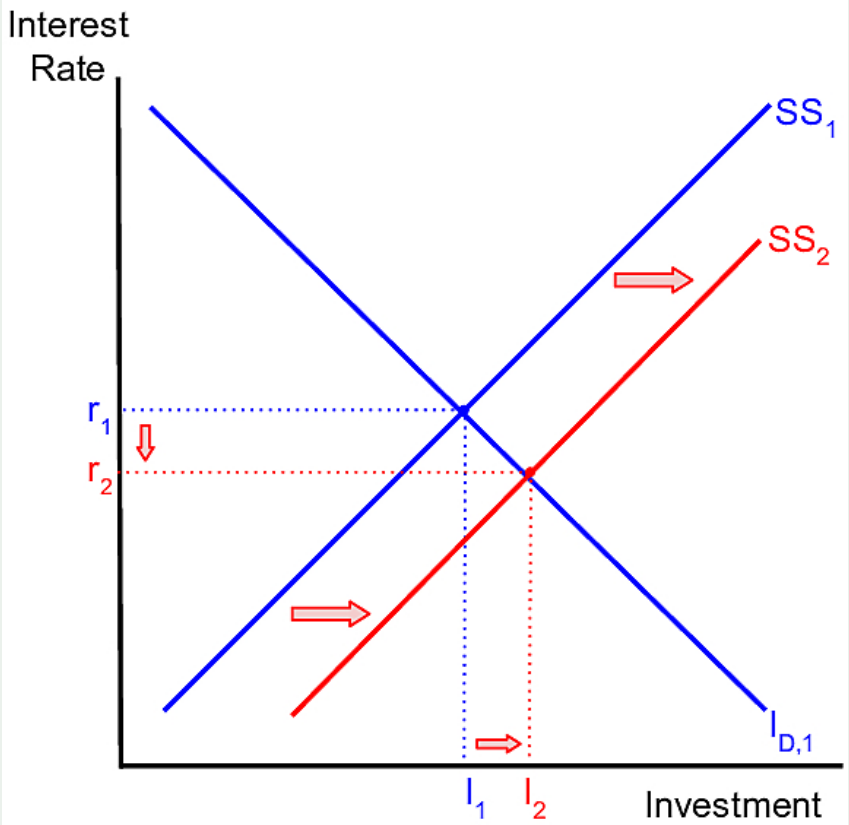

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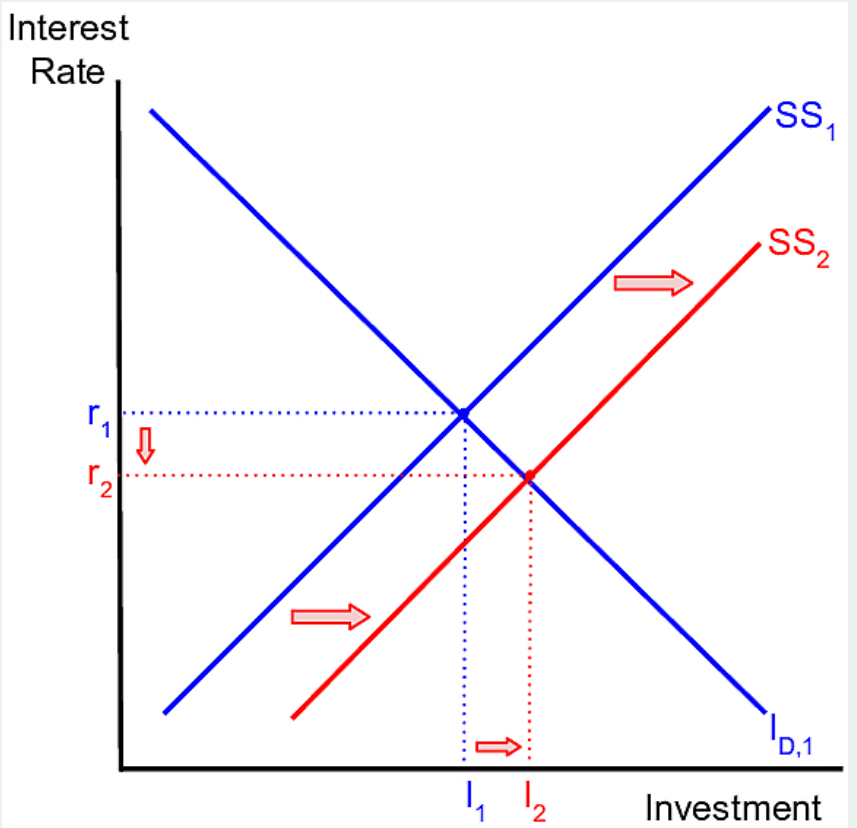

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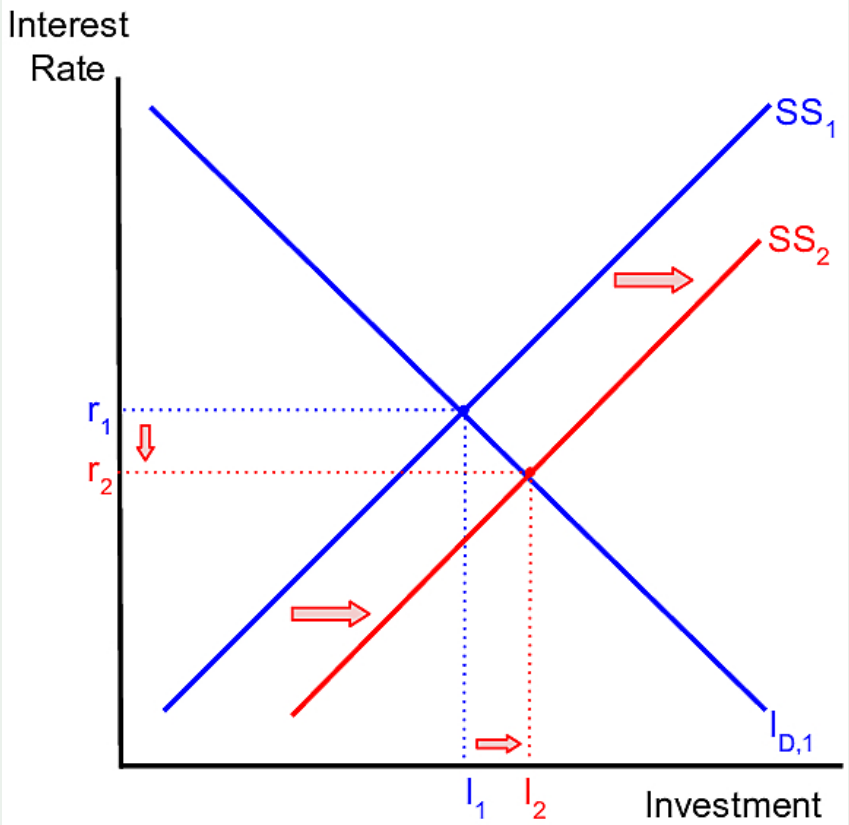

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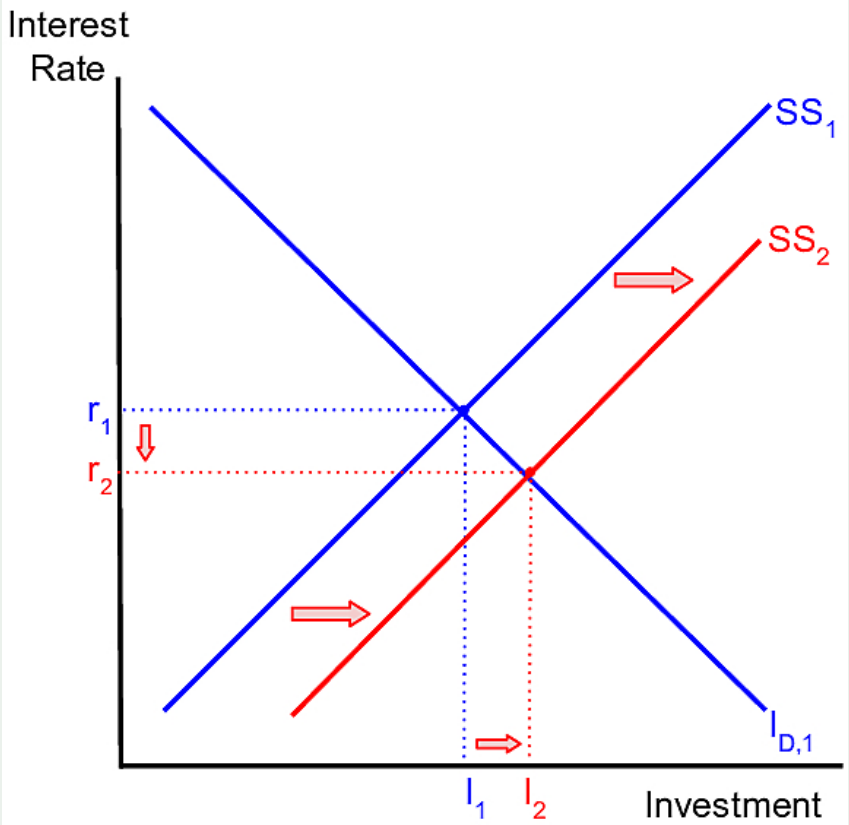

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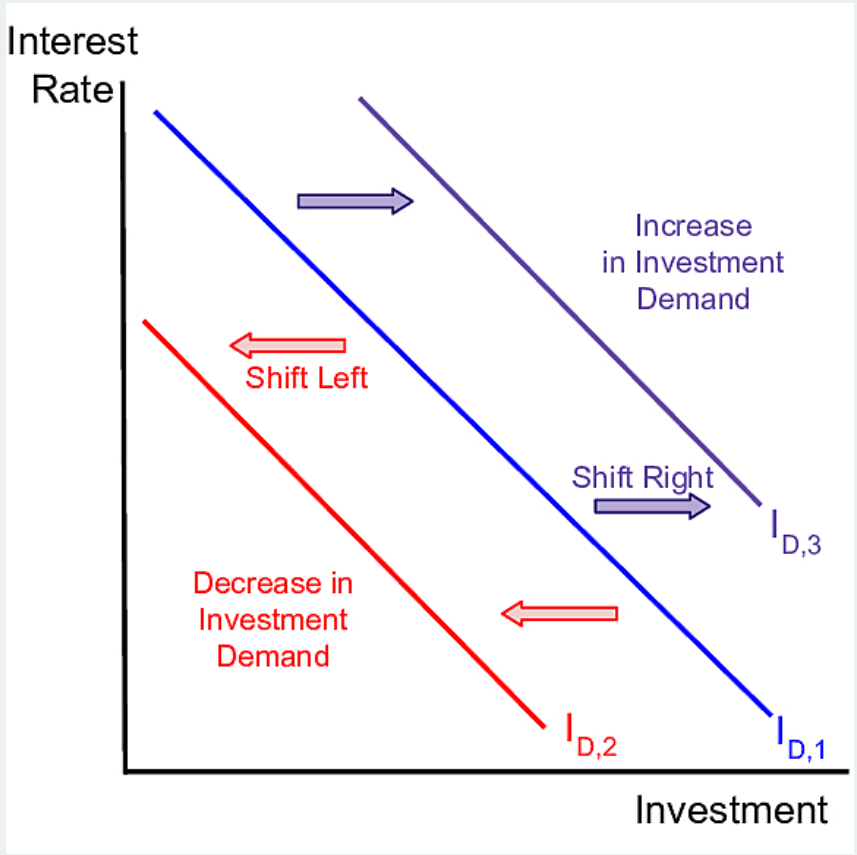

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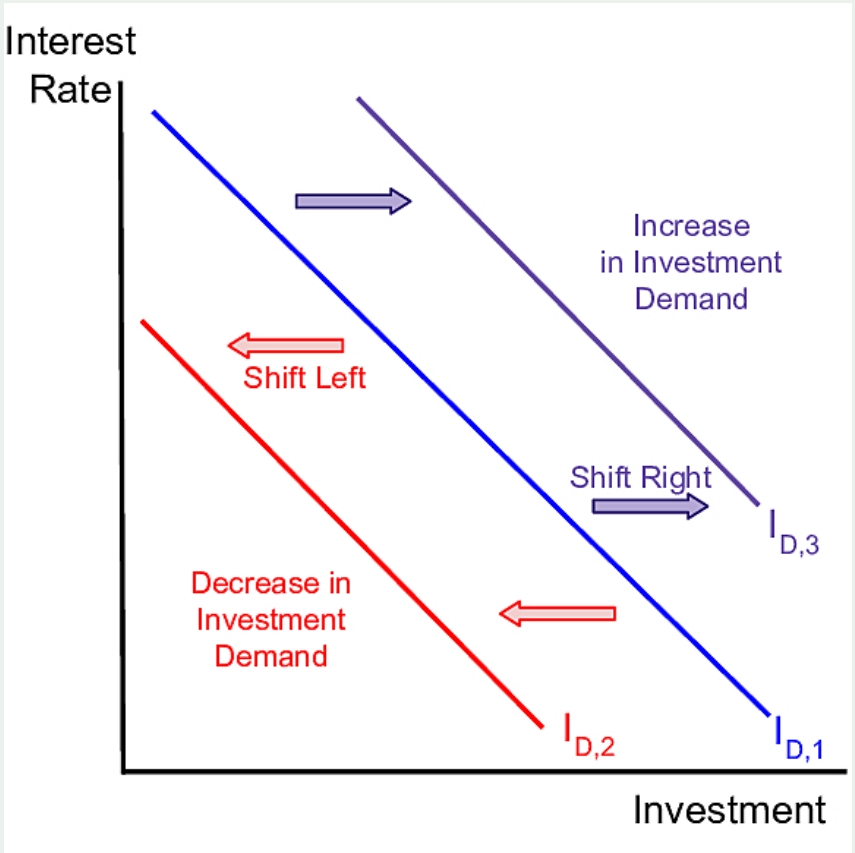

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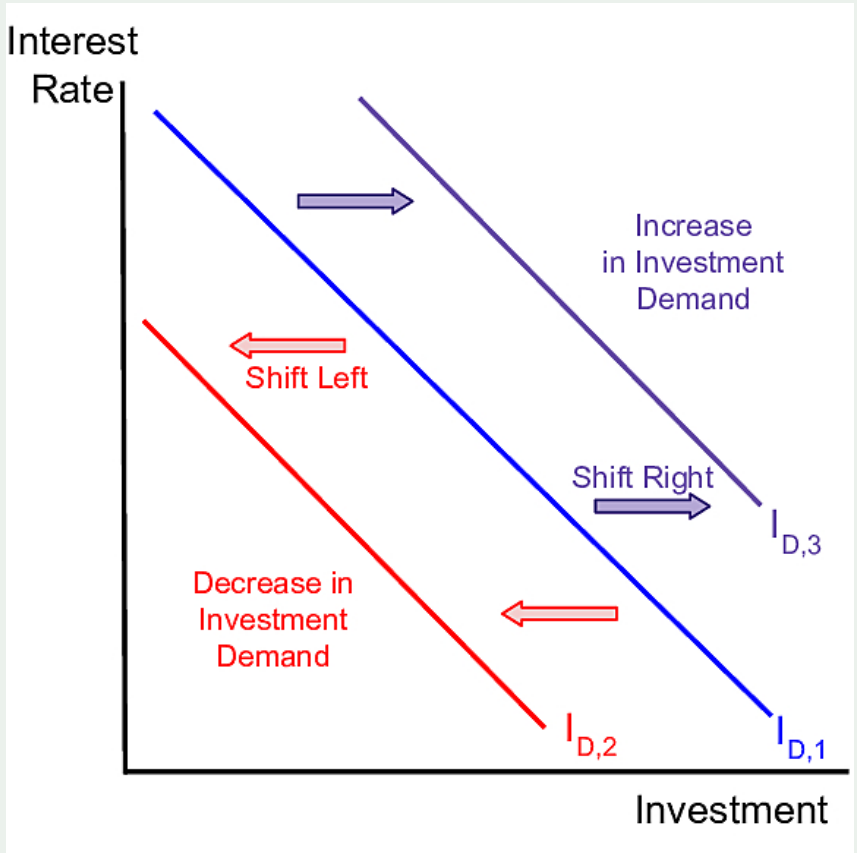

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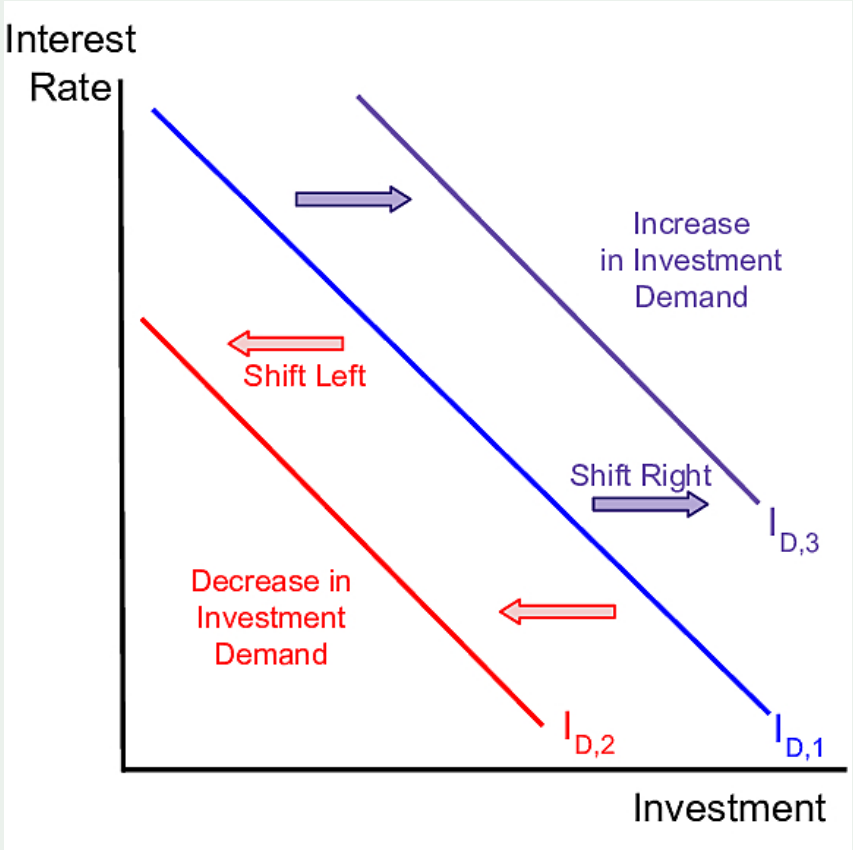

Investment Demand Factors

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
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Businesses' Economic Outlook

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- Suppose businesses are pessimistic about future sales
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- Equilibrium interest rate decreases
- Equilibrium quantity of investment decreases

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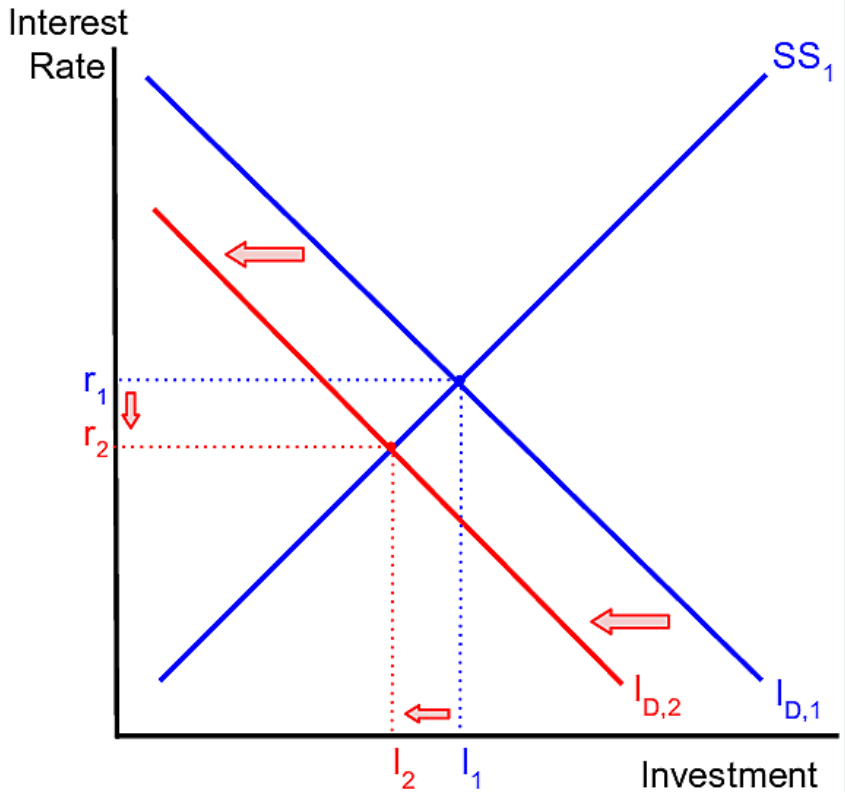

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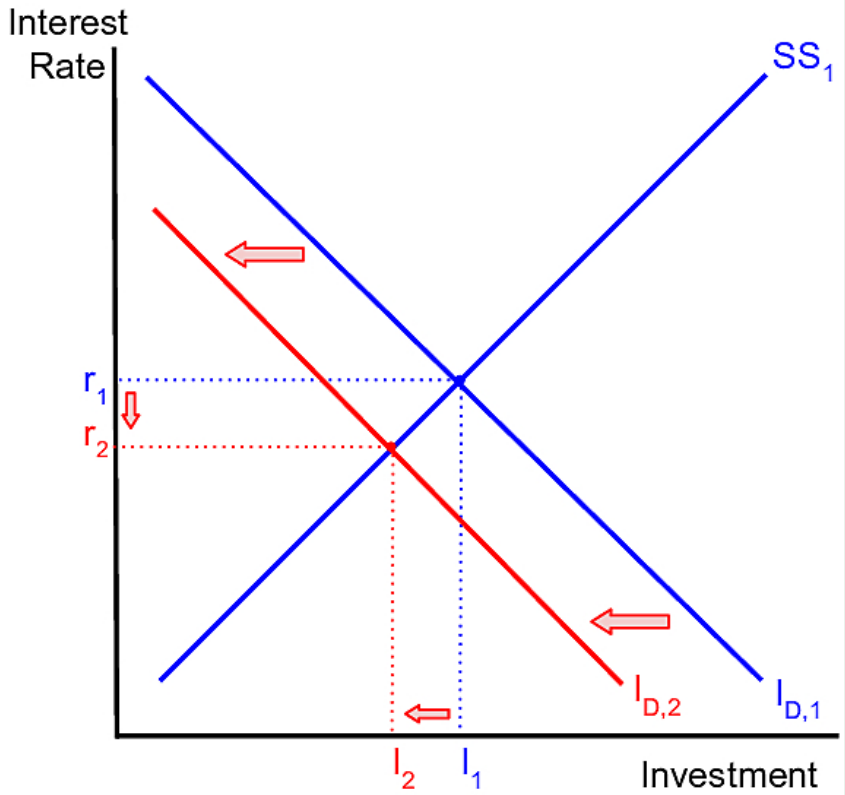
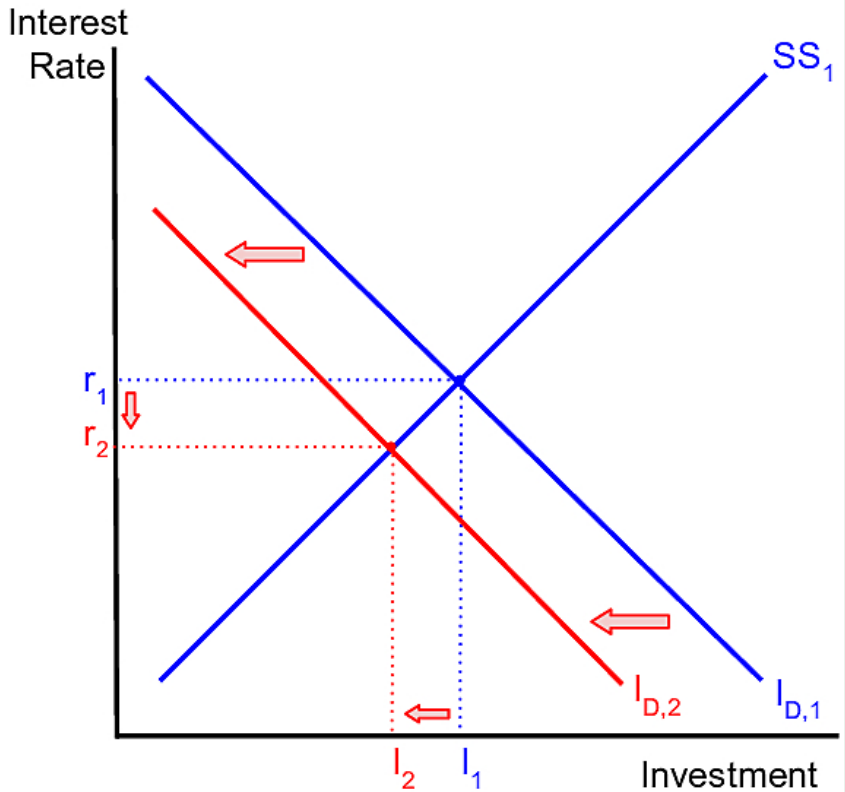


Businesses' Economic Outlook

Mechanism

- Suppose businesses are pessimistic about future sales
- Investment demand shifts to the left
- Equilibrium interest rate decreases
- Equilibrium quantity of investment decreases

Graphical Equilibrium



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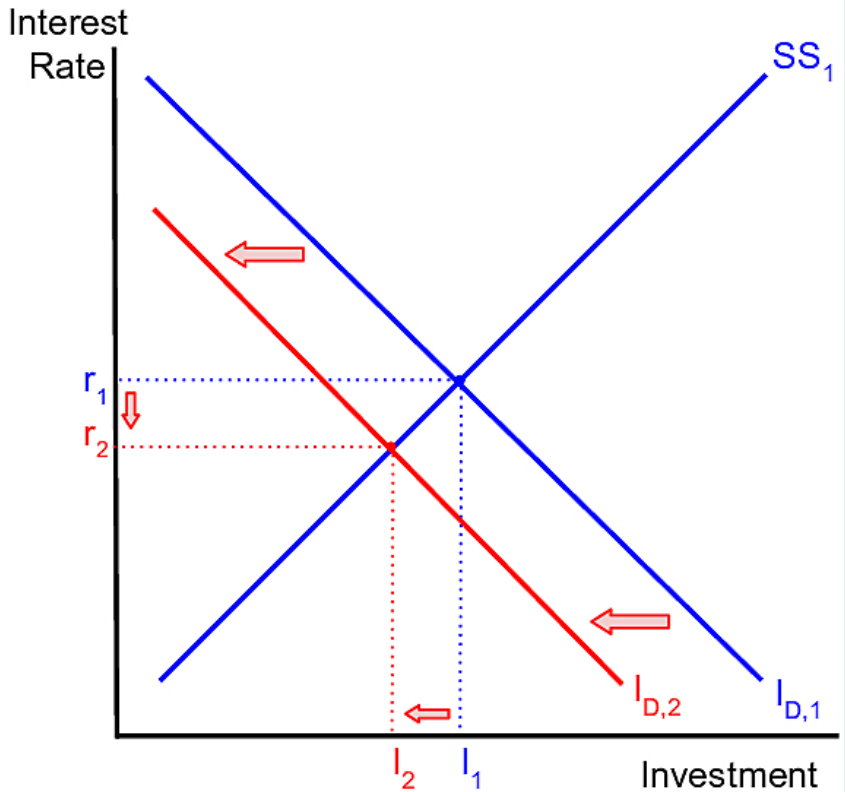

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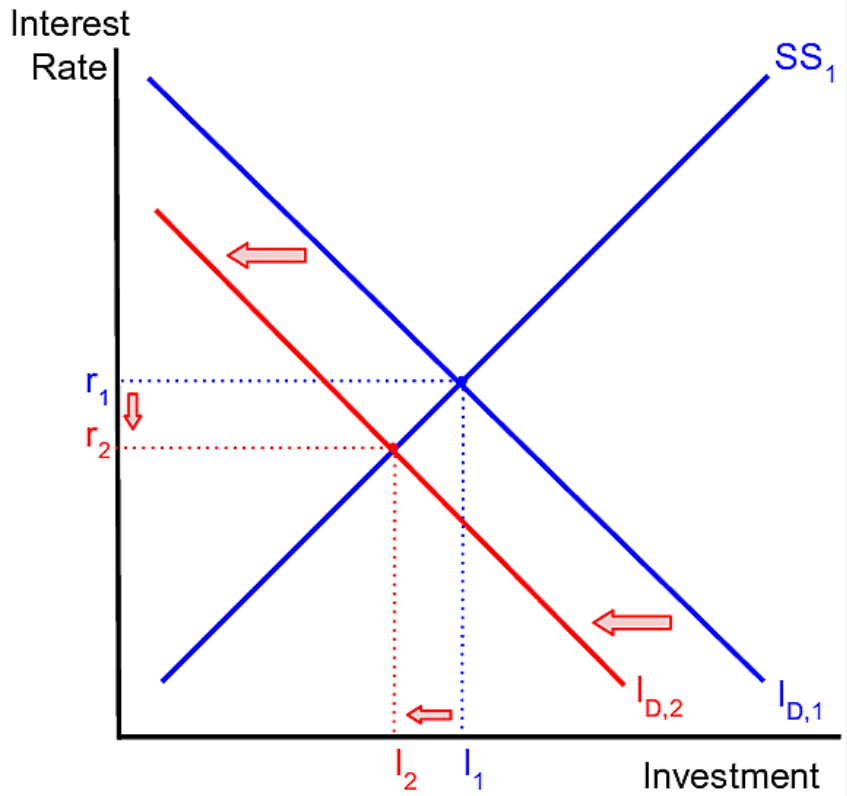

Improvement in Technology

Mechanism

- Suppose improvements in technology make workers and capital more productive
- Investment demand shifts to the right
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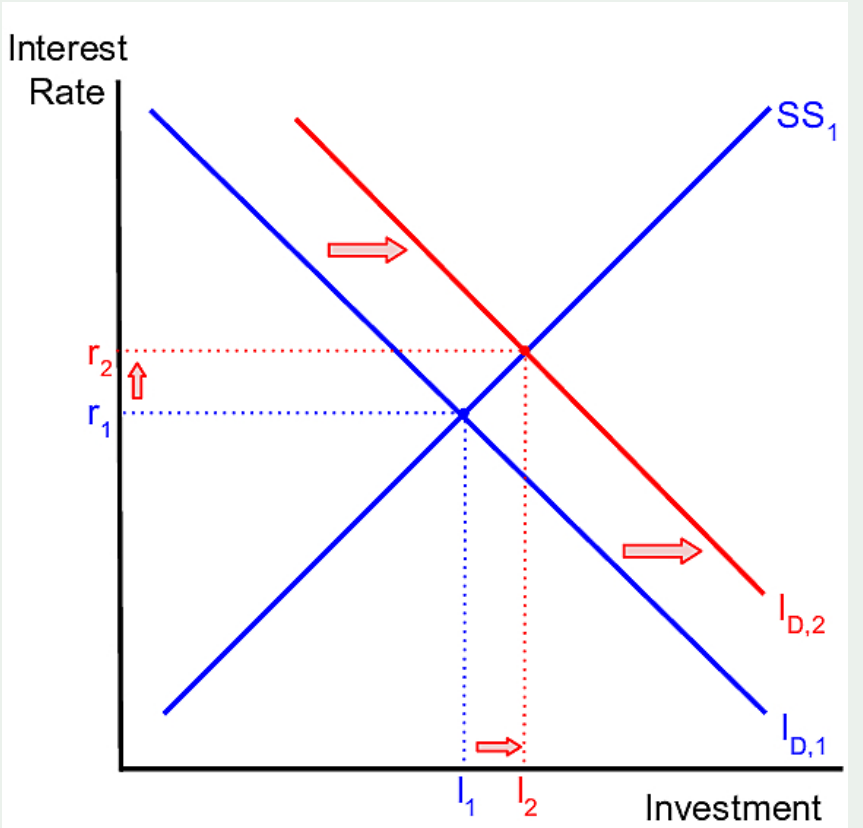

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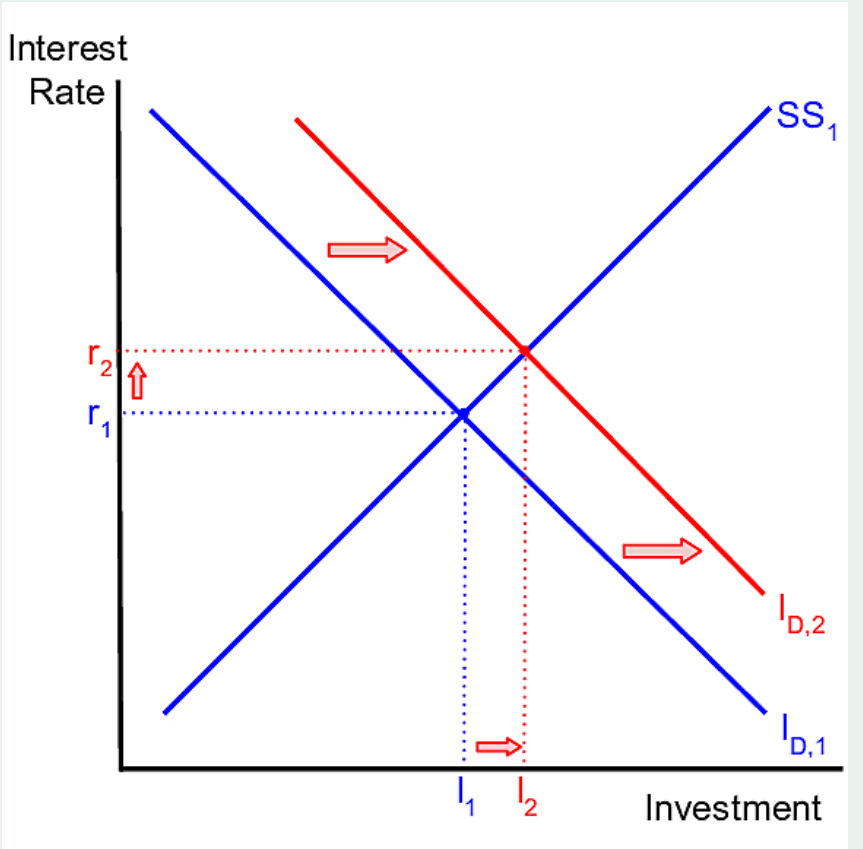

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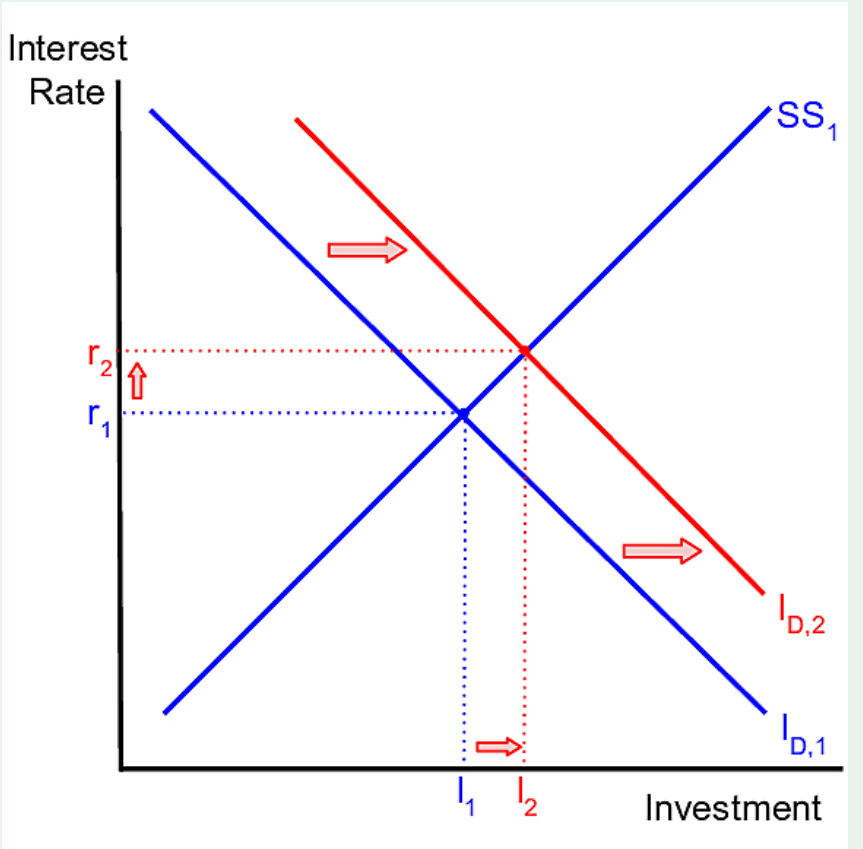

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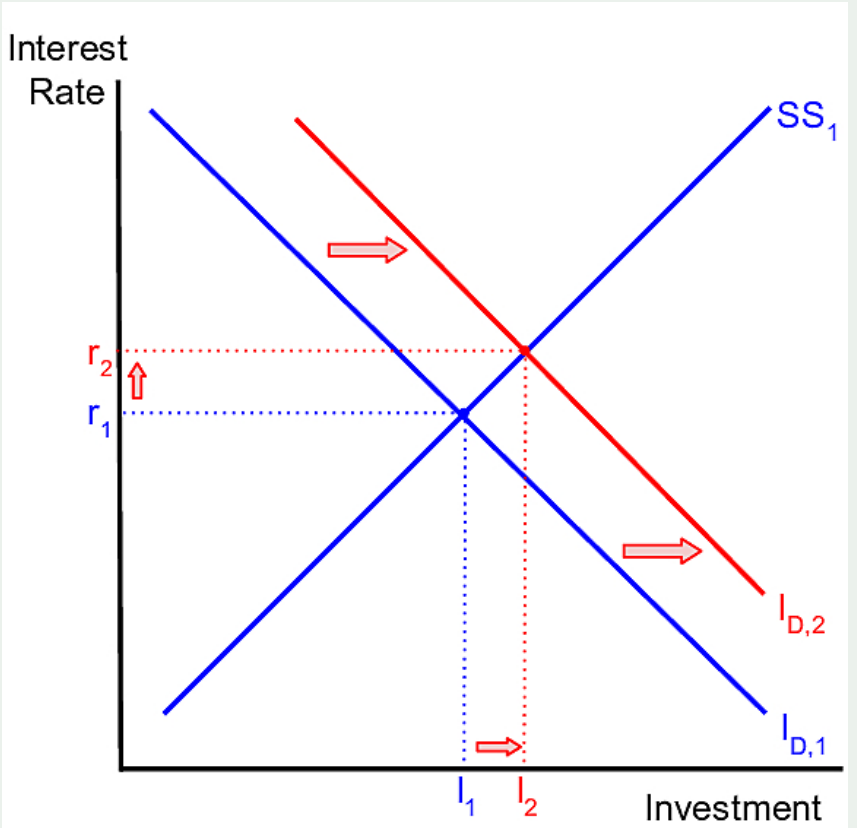

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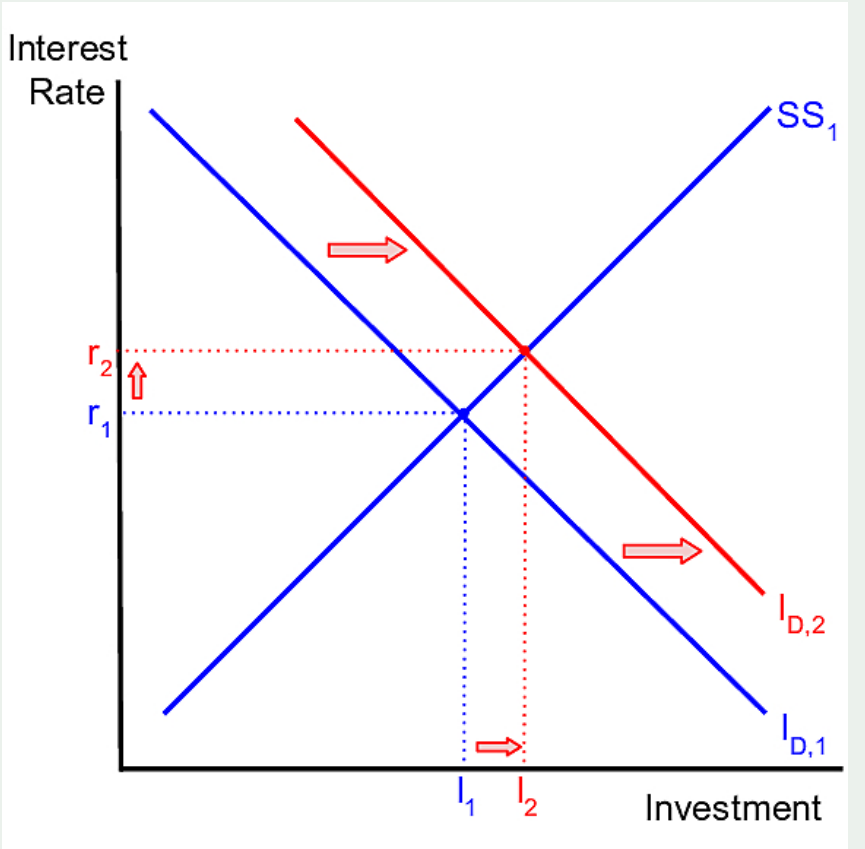

Destruction of Capital Stock

Mechanism

- Suppose a hurricane destroys capital stock
- Decrease in capital $\rightarrow$ increase in MP_K
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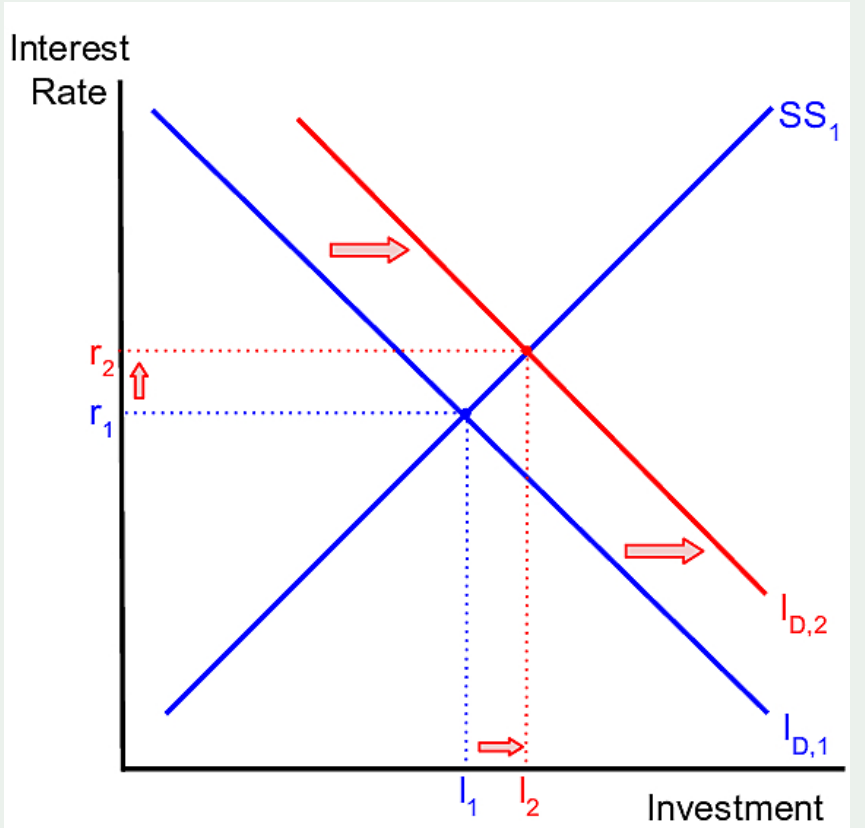

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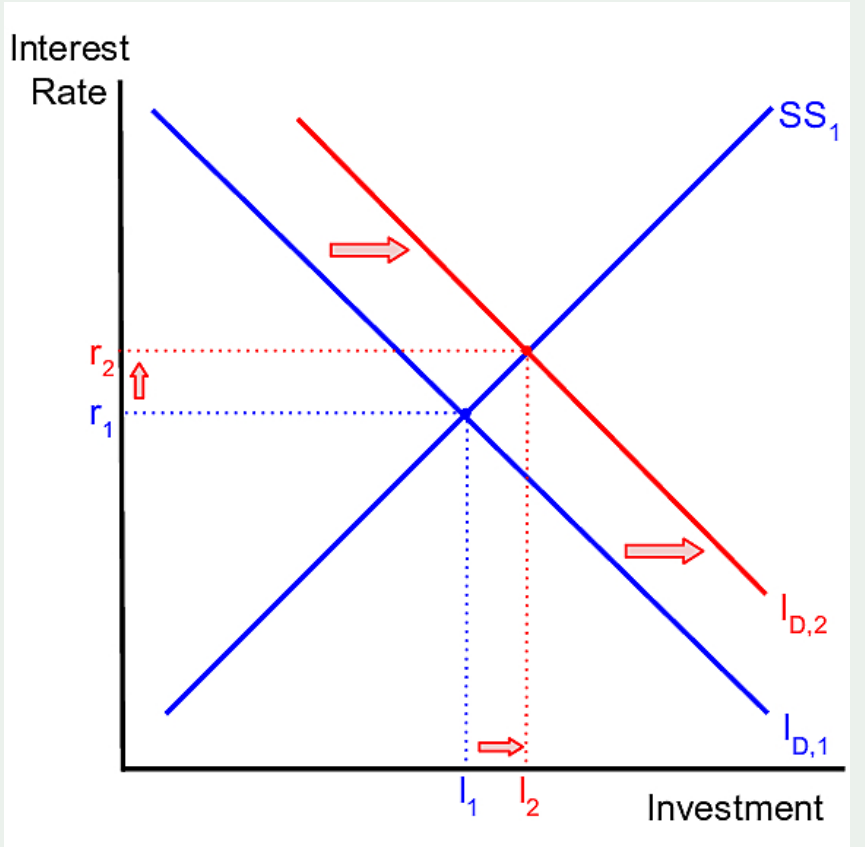

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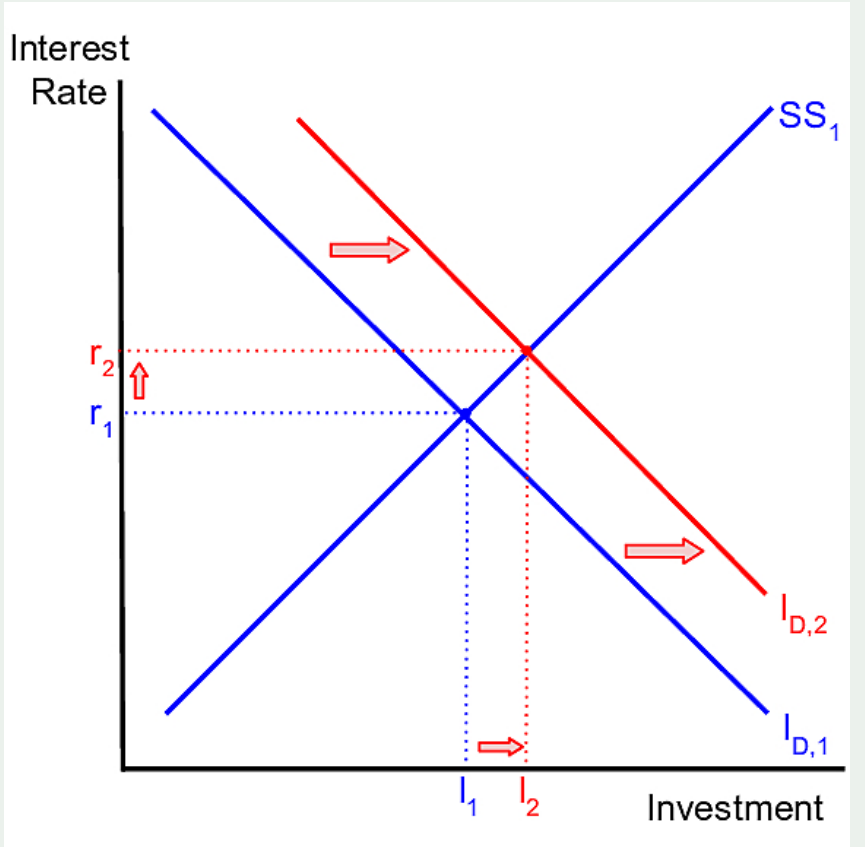

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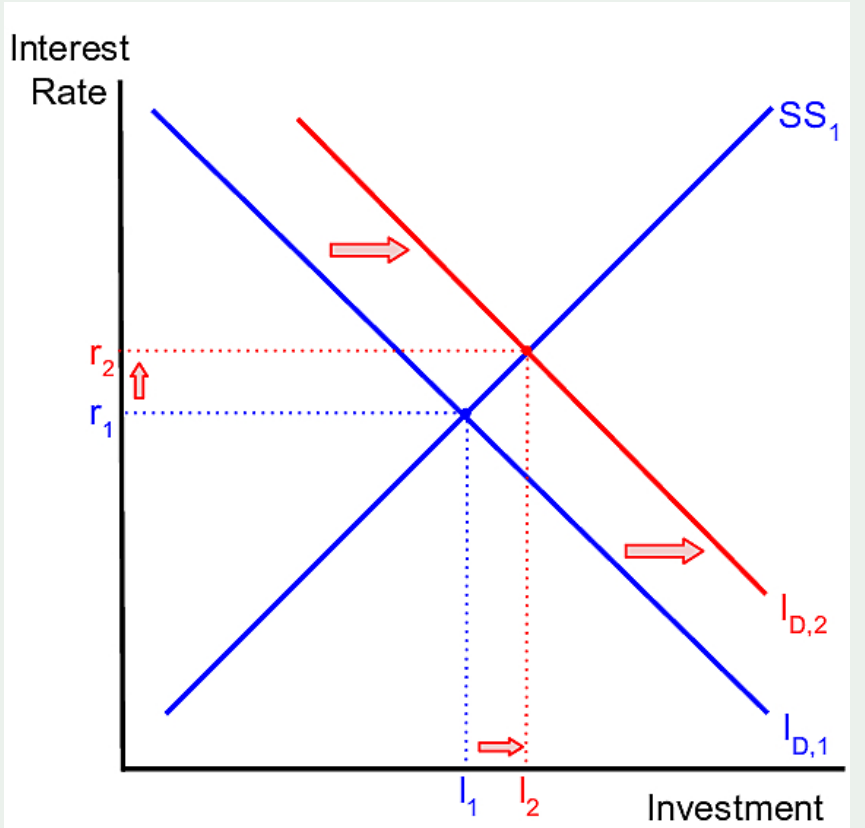

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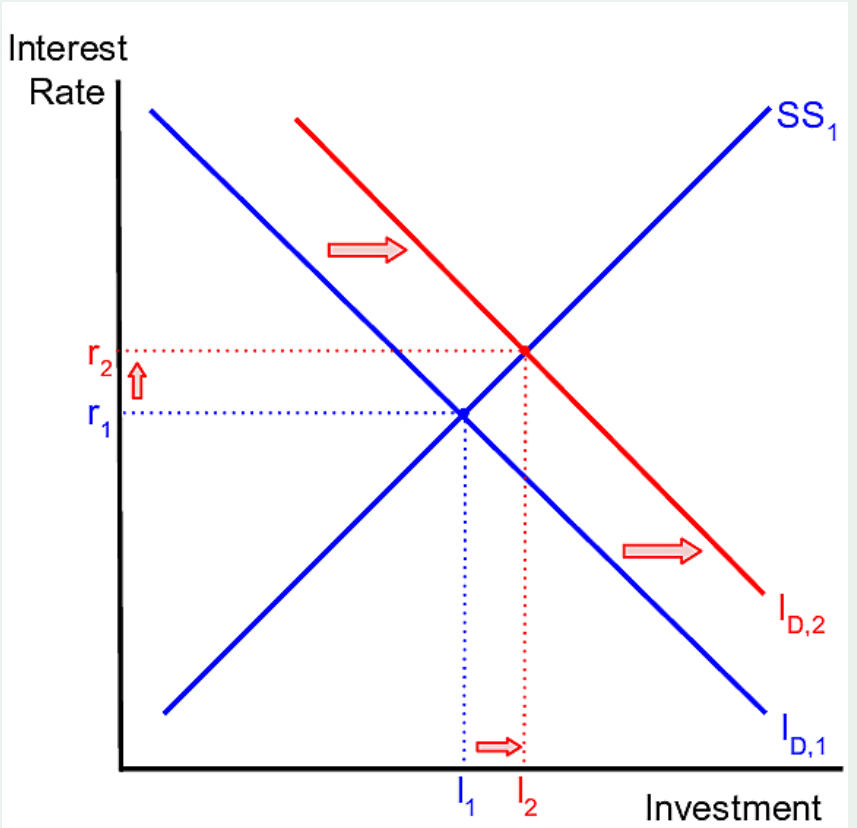

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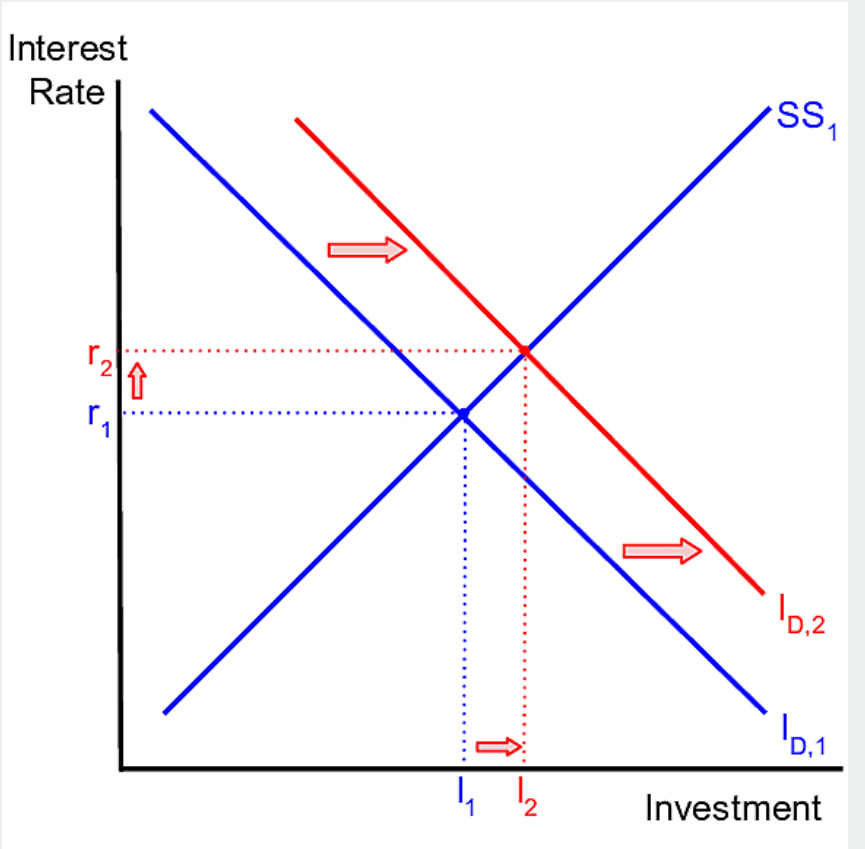

Spotlight: Valerie Ramey

The Macroeconomic Consequences of Infrastructure Investment, Published in *Economic Analysis and Infrastructure Investment*, Eds. E. Glaeser and J. Poterba, 2021.

Benefits and Consequences

- Short-run: Crowds out private investment (leftward SS shift)
- Long-run: Can increase investment if infrastructure complements private capital
- Short-run and long-run positive impact on employment
- Lack of empirical evidence for positive effects from ARRA road construction expenditures

Dr. Valerie Ramey
Professor of Economics
University of California-San Diego

Reading and Exercises

- Textbook module 43
- Check out the instructional videos, 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
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