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

- Savings: Ch 13, pp. 393-343
- Investment: Ch 14, pp. 362-365
- 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, 15 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.

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
- Algebra 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

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

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, the higher is private savings
- Higher interest rate, the higher is rest-of-world saving

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 higher is the incentive to save,
- the higher will be the quantity of private savings

Consumer Borrowing Dependence on Interest Rate

The higher is the interest rate, the more costly it is to borrow,

- the less consumers will borrow.
- Borrowing is negative saving, less borrowing = more saving

Government Savings and Deficits & Interest Rate

Government Saving

- Government Saving: $S_g = T - G$
- Government Budget Deficit: G - T:
  When government expenditures exceed tax revenue in a given period
- Government Saving = -1 x Government Budget Deficit
- ↑ Government budget deficit ≡ ↓ S_g

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

Rest-of-World Savings & Interest Rate

Rest-of-World Saving

- $S_{ROW} \equiv M - X \equiv$ Trade deficit
- $S_{ROW} = -1\ x\ (X - M) =$ Negative of net exports
- S_{ROW} is net level of borrowing, net financial capital inflows into a country

Rest-of-World Saving when Interest Rate Increases

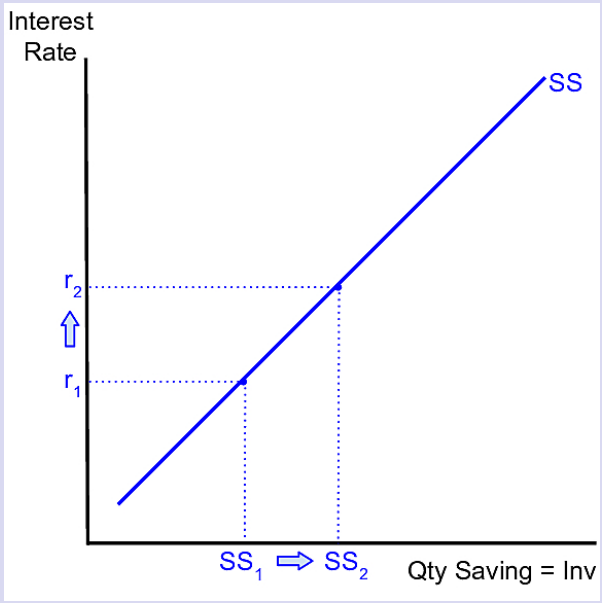
- Currency appreciates against major trading partners →
- Currency more expensive → exports more expensive → $\downarrow X$
- Currency more expensive → imports less expensive → $\uparrow M$
- $\uparrow (M - X) \rightarrow \uparrow S_{ROW}$

Saving Supply Curve

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



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

Impact of Higher Interest Rate

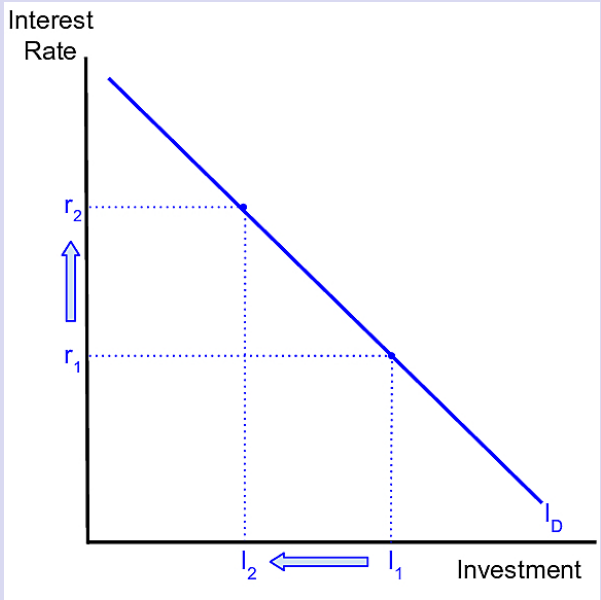
- When investment is financed with borrowing:
  Higher interest rate increases the cost to borrow, leads to decrease in investment
- When financed with accumulated savings:
  Higher interest rate means more the income earned keeping funds in financial investments, leads to greater is the opportunity cost of investment, leads to decrease in investment

Investment Demand

Investment Demand

- 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

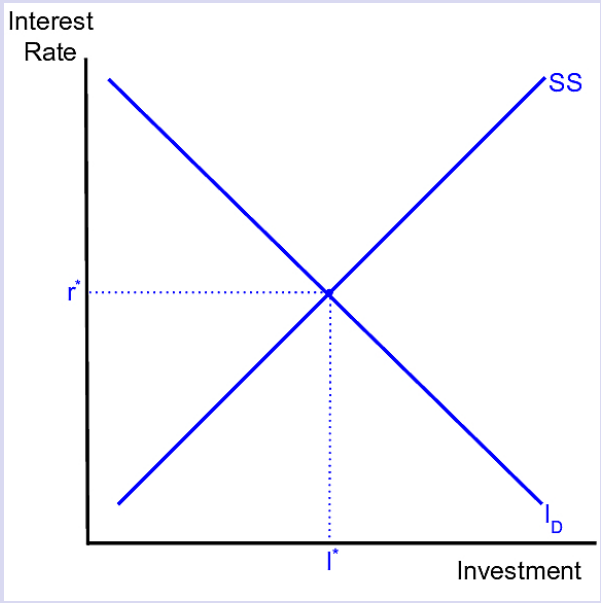


Equilibrium

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

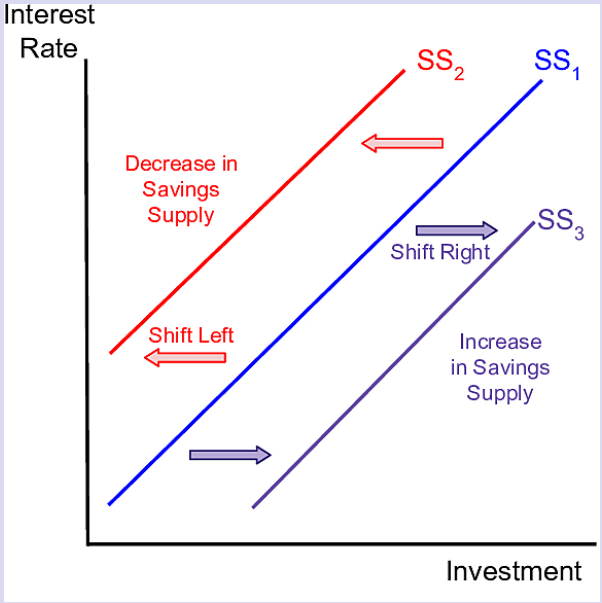


Shifts in Saving Supply

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**
- Something that **decreases** saving supply shifts the saving supply curve to the **left**

Shifts in Saving Supply

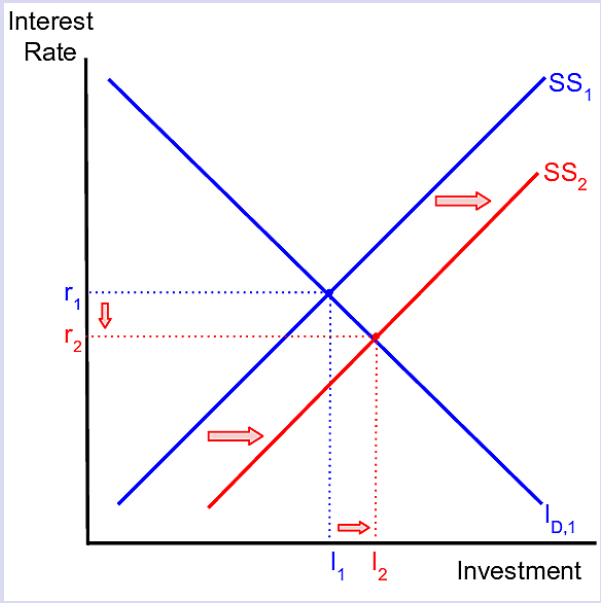


Increase in Private Saving

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

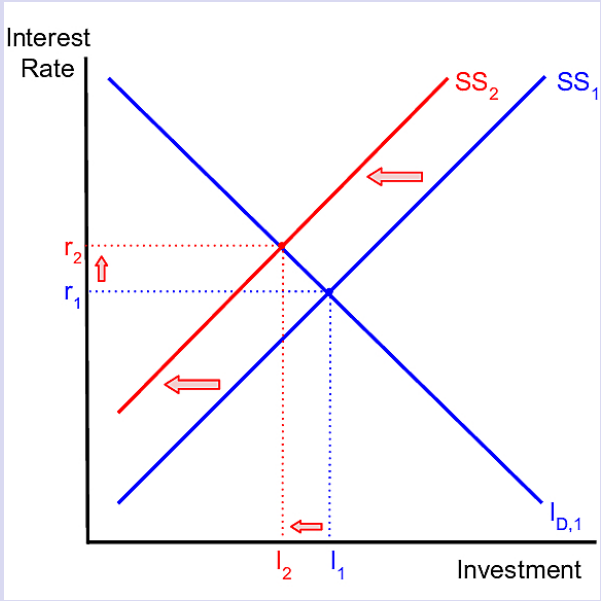


Increase in Government Budget Deficits

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
- Equilibrium quantity of investment decreases

Graphical Equilibrium

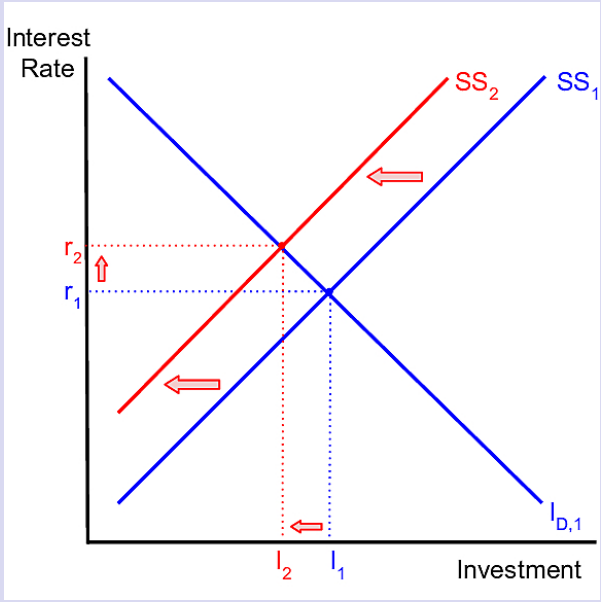


Decrease in Trade Deficits

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

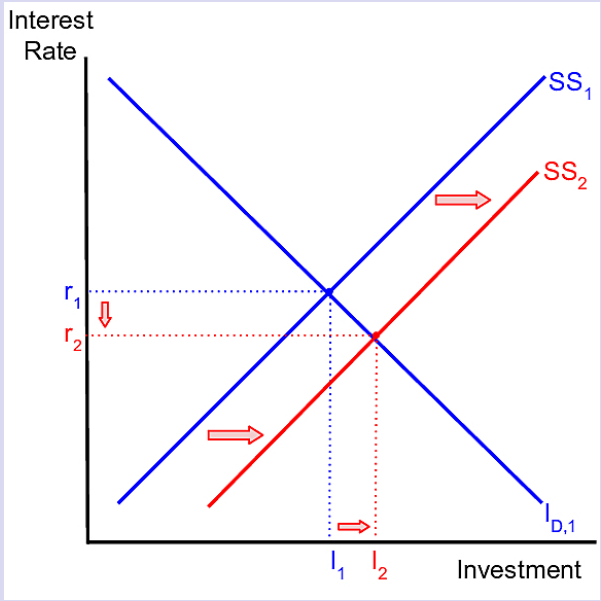


Increase in Trade Deficits

Mechanism

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

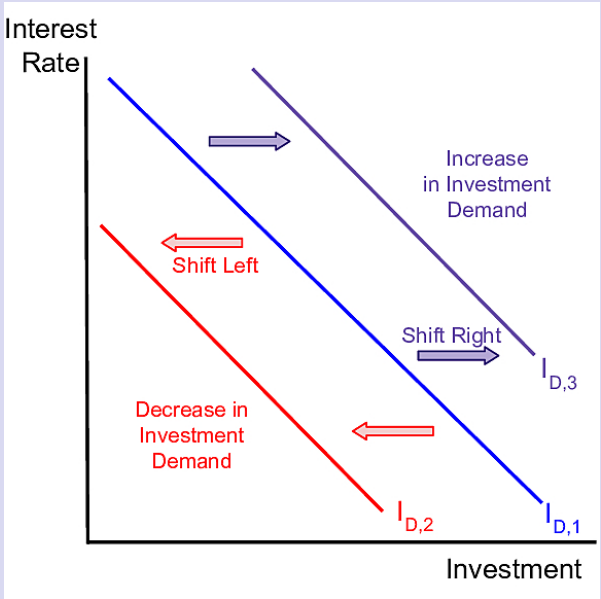


Shifts in Investment Demand

Shifts in Investment Demand

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Graphical Illustration



Investment Demand Factors

Expectations of Future Profitability

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

Marginal Product of Capital

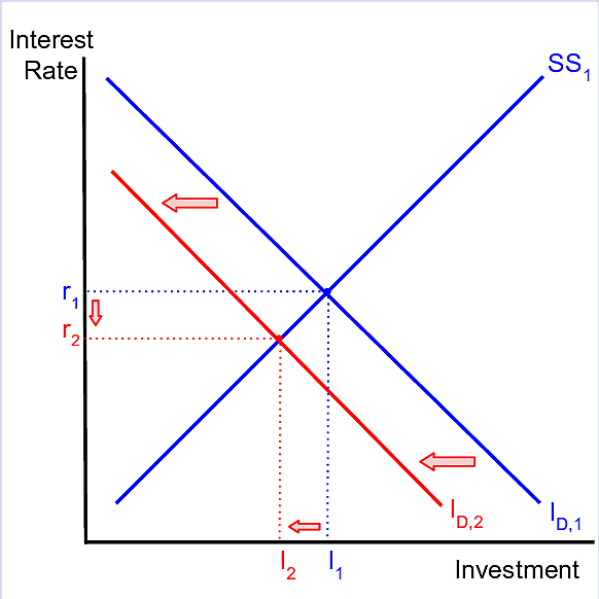
- Investment demand also depends on future marginal product of capital
- **Marginal product of capital:** Additional production possible from one more unit of capital
- **Law of Diminishing Returns:** As capital stock increases, marginal product of capital decreases

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

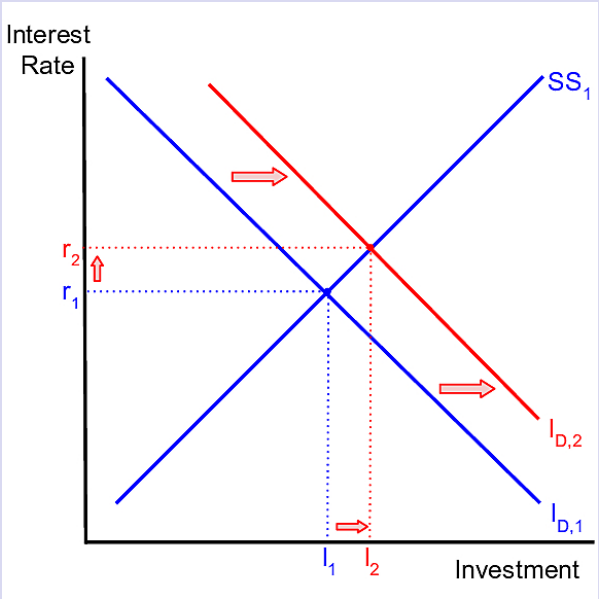


Improvement in Technology

Mechanism

- Suppose improvements in technology make workers and capital more productive
- Investment demand shifts to the right
- Equilibrium interest rate increases
- Equilibrium quantity of investment increases

Graphical Equilibrium

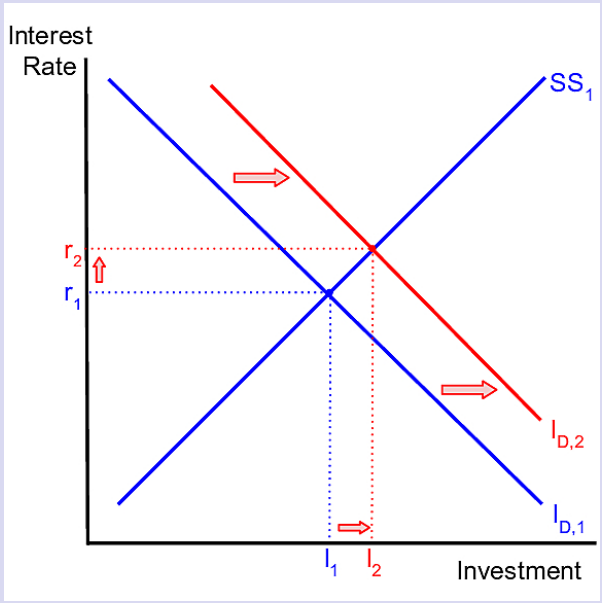


Destruction of Capital Stock

Mechanism

- Suppose a hurricane destroys capital stock
- Decrease in capital → increase in MP_K
- Investment demand shifts to the right
- Equilibrium interest rate increases
- Equilibrium quantity of investment increases

Graphical Equilibrium



Scholar Spotlight: Valerie Ramey

The Macroeconomic Consequences of Infrastructure Investment
Economic Analysis and Infrastructure Investment, Editors 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 (rightward I_d shift)
- Short-run and long-run positive impact on employment
- Lack of empirical evidence for positive effects from ARRA road construction expenditures

About the Scholar



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