Chapter 8





# 8


# Basic Macroeconomic Relationships

Chapter 8

# Chapter Objectives

- How Changes in Income Affect Consumption (and Saving)
- About Factors Other Than Income That Can Affect Consumption
- How Changes in Real Interest Rates Affect Investment
- About Factors Other Than the Real Interest Rate That Can Affect Investment
- Why Changes in Investment Increase or Decrease Real GDP by a Multiple Amount

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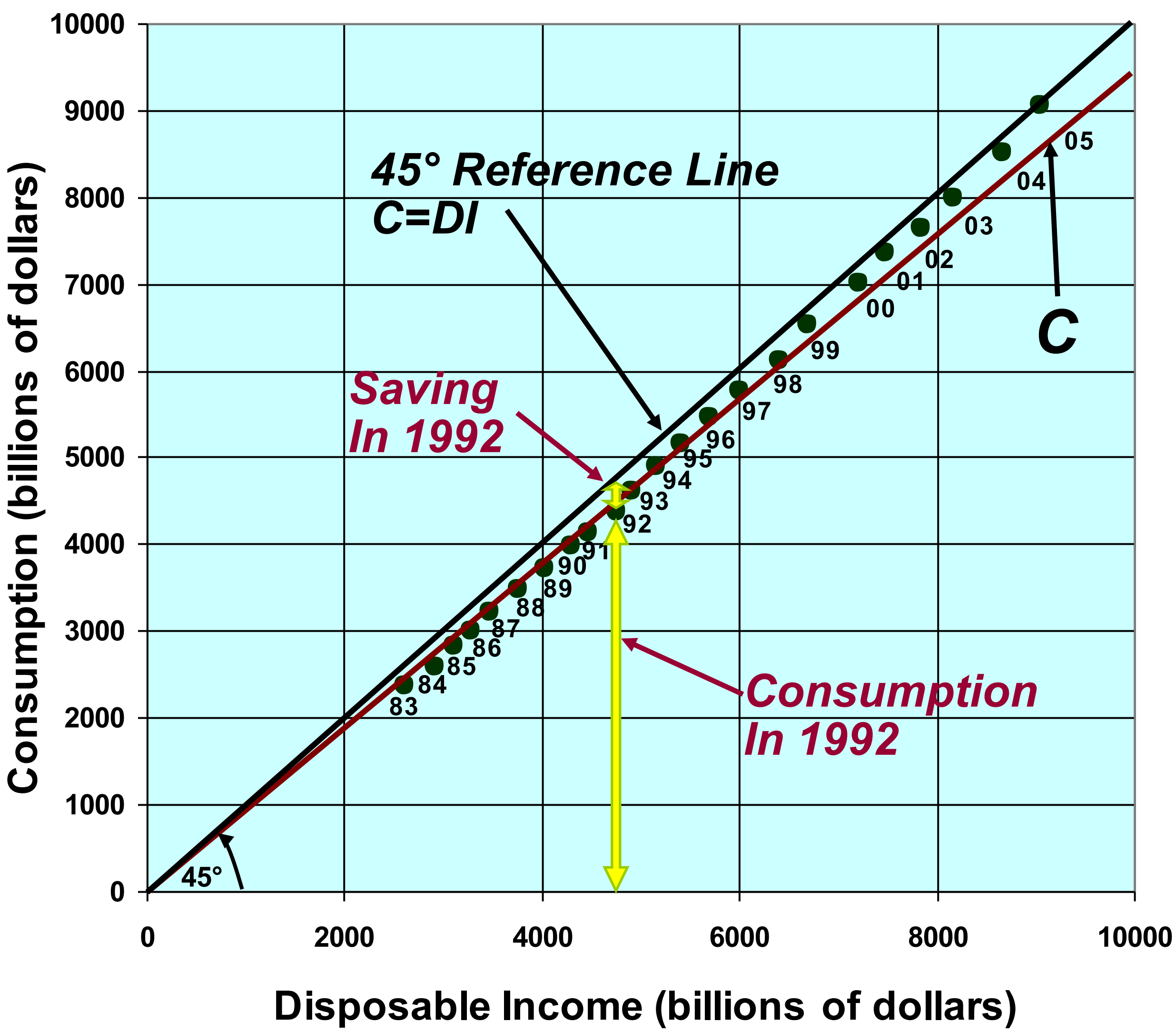
# Basic Relationships

- **<u>Income-Consumption</u> – relationship between each persons disposable income (after taxes) and their consumption (spending).**
- **<u>Income-Saving</u> – relationship between each persons disposable income and saving (income not spent).**
- **<u>45° Line</u> – reference line where C = DI**
  - C = DI *on the Line*
- **<u>S = DI – C</u> (the vertical distance between the 45° and C (consumption) is equal to S (savings).**

# Income and Consumption

## *Consumption and Disposable Income, 1983-2005*



# Consumption and Saving

- **The Consumption Schedule** (consumption function) – shows the direct relationship between consumption (C) and disposable income (DI)
  - C increases as DI increases
  - C decreases as DI decreases
- **The Saving Schedule** (saving function) – shows the direct relationship between saving (S) and disposable income (DI)
  - S decreases at an increasing rate as DI falls
  - S increases at an increasing rate as DI rises
- **Break-Even Income** – where C=DI
  - Dissaving occurs when DI is below break-even
  - Saving occurs at incomes above break-even

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# Consumption and Saving

- **Average Propensity to Consume (APC)** – the fraction or percentage of total income that is consumed
- **Average Propensity to Save (APS)** – the fraction or percentage of total income that is saved

$$APC = \frac{\text{Consumption}}{\text{Income}} \qquad APS = \frac{\text{Saving}}{\text{Income}}$$

- $APC + APS = 1$

# Consumption and Saving

- **Marginal Propensity to Consume (MPC)** – the fraction or proportion of any *change* in income that will be spent or consumed
- **Marginal Propensity to Save (MPS)** – the fraction or proportion of any *change* in income that will be saved

$$\text{MPC} = \frac{\text{Change in Consumption}}{\text{Change in Income}}$$

$$\text{MPS} = \frac{\text{Change in Saving}}{\text{Change in Income}}$$

- **MPC + MPS = 1**






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# Consumption and Saving



| | (1) Level of Output And Income (GDP=DI) | (2) Consump-tion (C) | (3) Saving (S) (1-2) | (4) Average Propensity to Consume (APC) (2)/(1) | (5) Average Propensity to Save (APS) (3)/(1) | (6) Marginal Propensity to Consume (MPC) Δ(2)/Δ(1) | (7) Marginal Propensity to Save (MPS) Δ(3)/Δ(1) |
|---|---|---|---|---|---|---|---|
| (1) | $370 | $375 | $-5 | 1.01 | -.01 | | |
| | | | | | | .75 | .25 |
| (2) | 390 | 390 | 0 | 1.00 | .00 | | |
| | | | | | | .75 | .25 |
| (3) | 410 | 405 | 5 | .99 | .01 | | |
| | | | | | | .75 | .25 |
| (4) | 430 | 420 | 10 | .98 | .02 | | |
| | | | | | | .75 | .25 |
| (5) | 450 | 435 | 15 | .97 | .03 | | |
| | | | | | | .75 | .25 |
| (6) | 470 | 450 | 20 | .96 | .04 | | |
| | | | | | | .75 | .25 |
| (7) | 490 | 465 | 25 | .95 | .05 | | |
| | | | | | | .75 | .25 |
| (8) | 510 | 480 | 30 | .94 | .06 | | |
| | | | | | | .75 | .25 |
| (9) | 530 | 495 | 35 | .93 | .07 | | |
| | | | | | | .75 | .25 |
| (10) | 550 | 510 | 40 | .93 | .07 | | |

Key Terms

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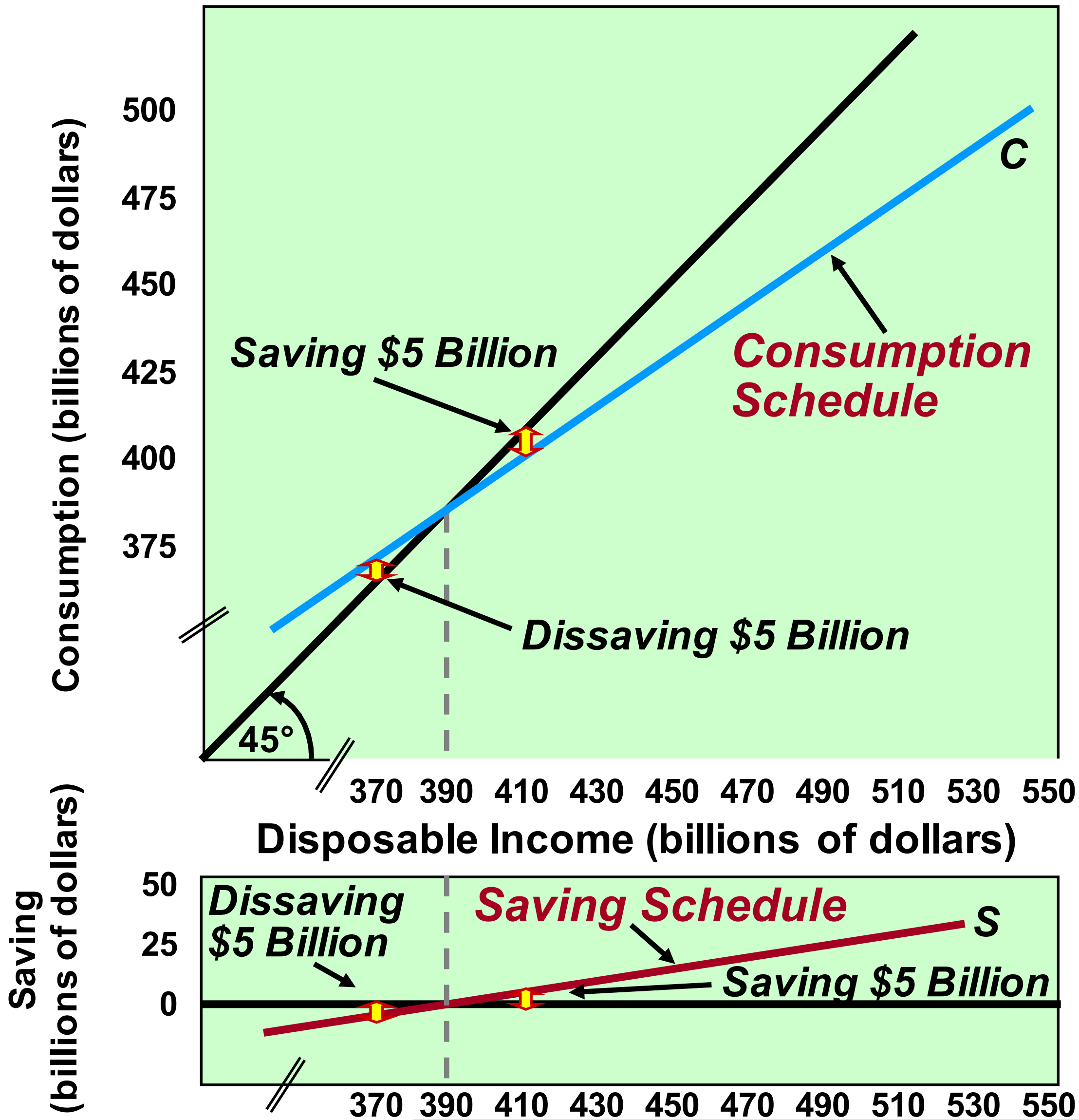
# Consumption and Saving

## *Consumption and Saving Schedules*



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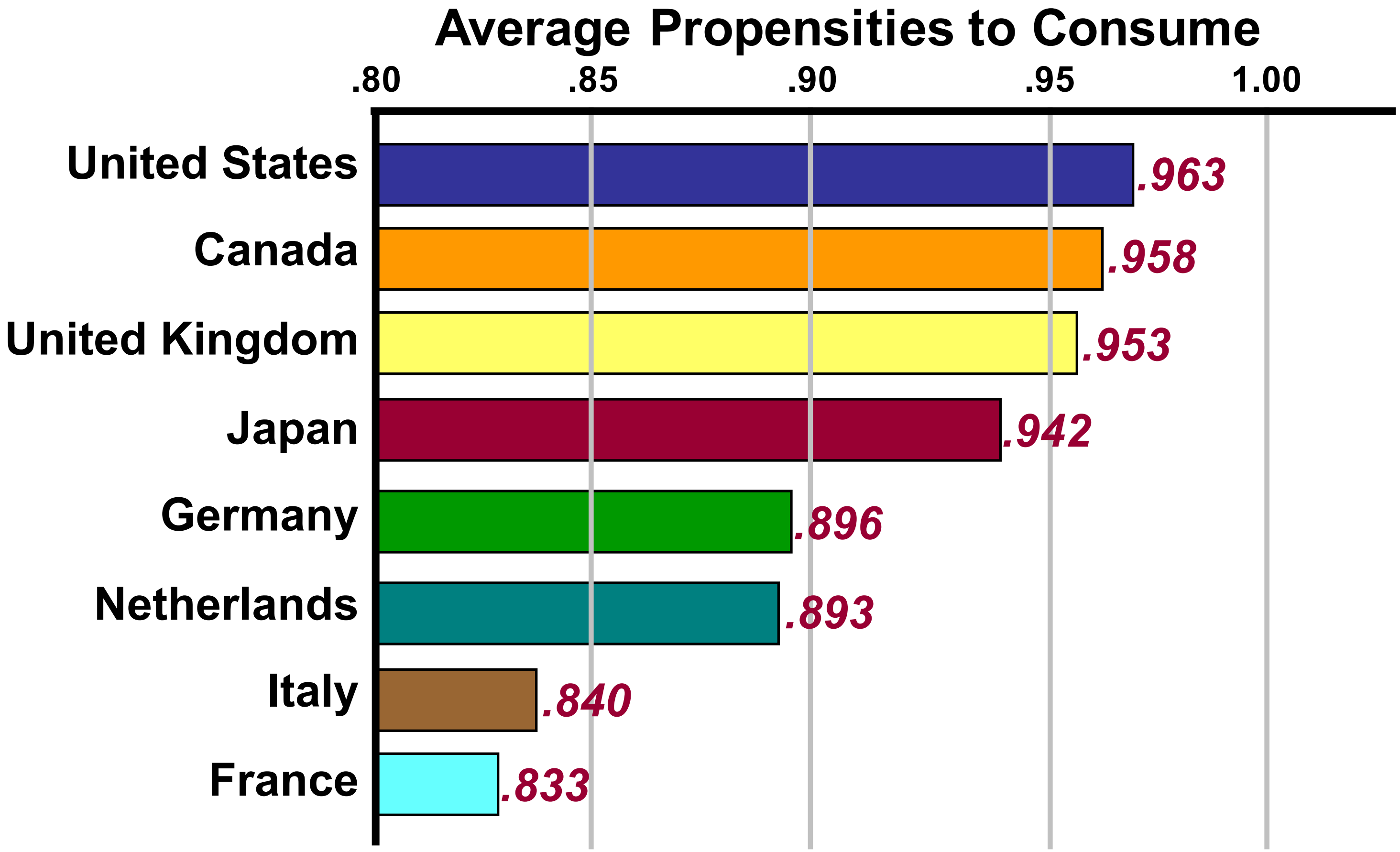
# Consumption and Saving

## GLOBAL PERSPECTIVE

### *Average Propensities to Consume Select Nations GDPs*




*Source: Statistical Abstract of the United States, 2006*

# Consumption and Saving

- MPC and MPS as Slopes – both are the slope of each respective schedule on the graph (ΔC/ΔDI, ΔS/ΔDI)
- Nonincome Determinants of Consumption and Saving (Shifts)
  - Wealth Effect – if the value of wealth increases, people will increase spending (shifts the consumption schedule up)
  - Expectations – if people expect a recession they will spend less (consumption schedule shifts down)
  - Real Interest Rates – if ↓, households borrow more, consume more, and save less
  - Household Debt – if ↑, consumption ↑, if debt↓, consumption ↓

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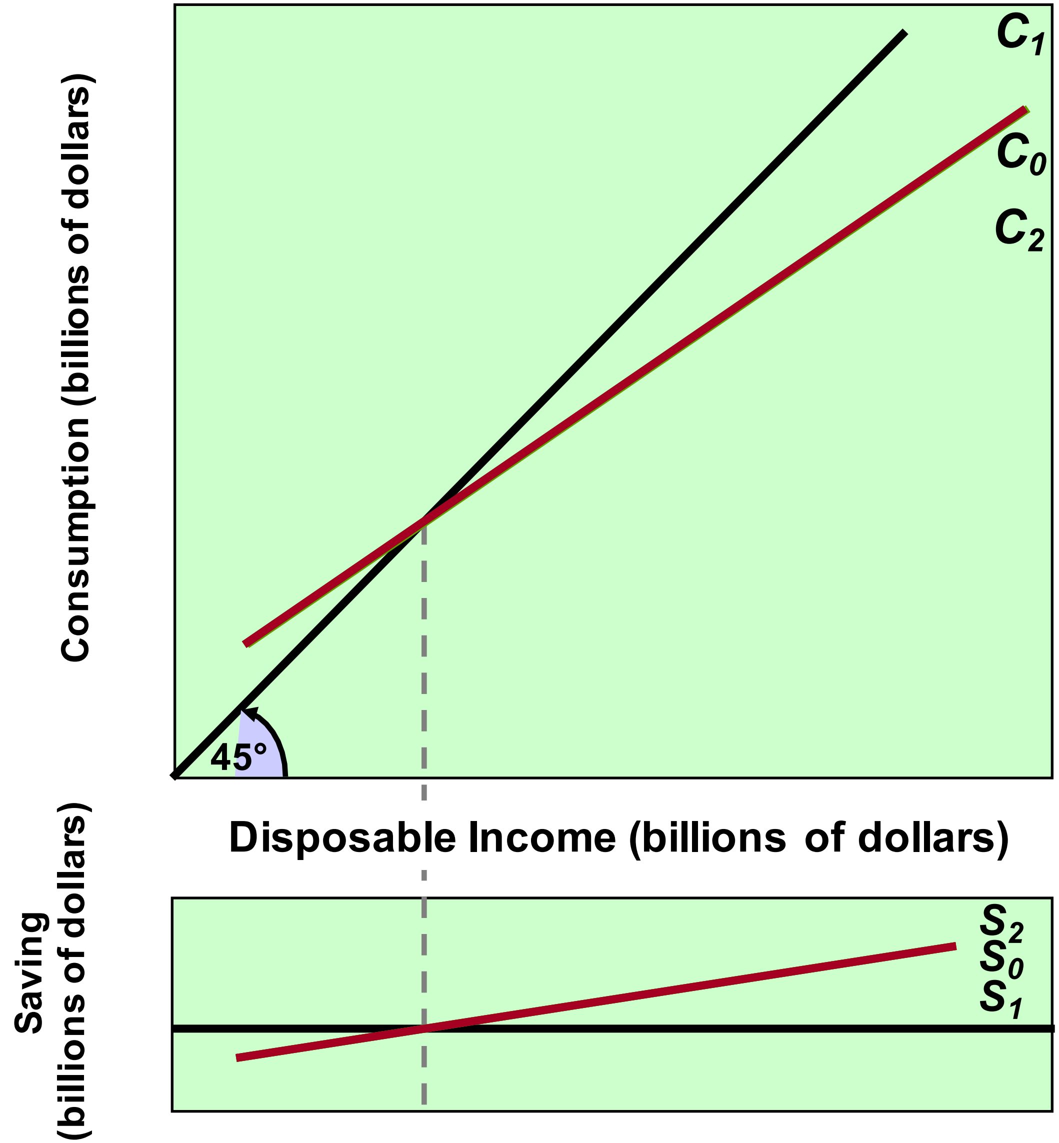
# Consumption and Saving

- **Switch to Real GDP** – macro models compare consumption and saving to real GDP
- **Changes Along Schedules** – movement along the schedule is caused by a change in real GDP (or aggregate DI)
- **Schedule Shifts** – any shift in consumption or savings will have the opposite shift in the other schedule
- **Taxation** – taxes↑ reduce both S and C, taxes ↓, increase both S and C
- **Stability** – the S and C schedules are usually relatively stable due to long-run considerations and multiple effects that may be self-canceling

# Consumption and Saving

## *Consumption and Saving Schedules*



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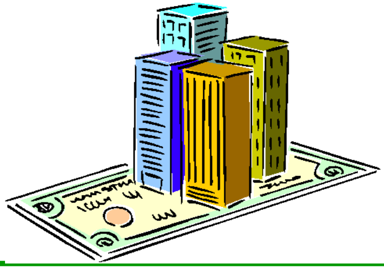
# Interest Rate and Investment

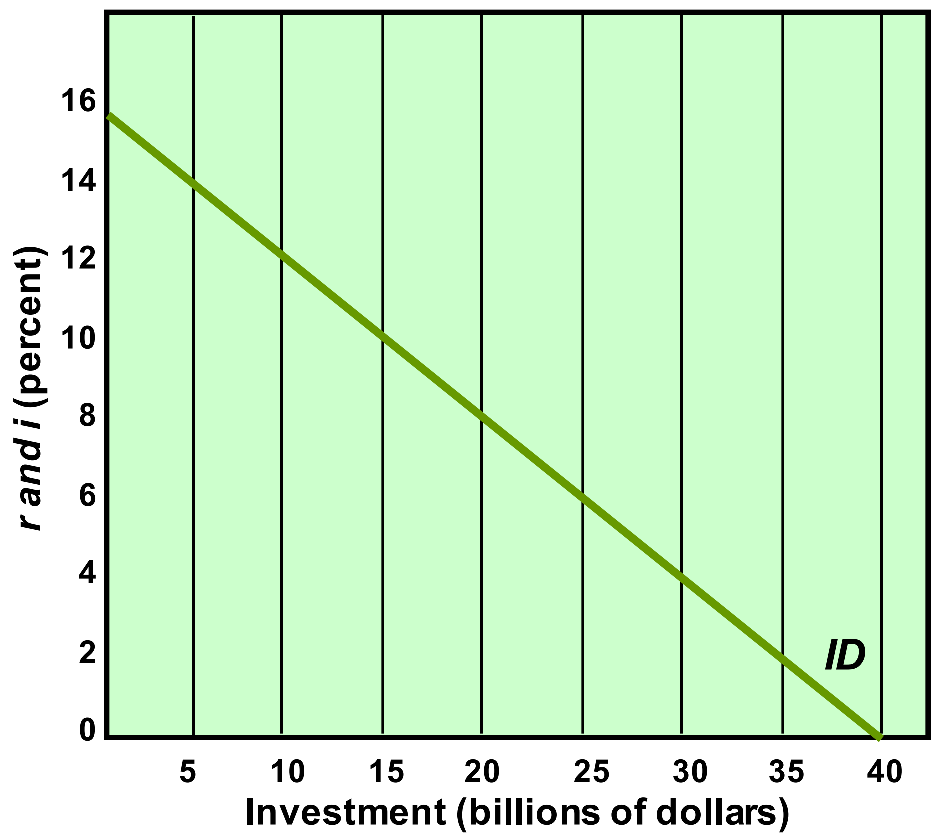
- **<u>Expected Rate of Return *(r)*</u> = marginal benefit of investment (profit)**
- **<u>The Real Interest Rate *(i)*</u> = the marginal cost businesses pay for an investment (adjusted for inflation)**
- **<u>Meaning of *r* = *i*</u> Businesses should invest in all projects where *r* ≥ *i* because these should be profitable. They should never invest when *r* < *i* because the costs outweigh the benefits.**
- **<u>Investment Demand Curve *(ID)*</u> – shows inverse relationship between real interest rate and investment.**



# Interest Rate and Investment

## *The Investment Demand Curve*

| Expected Rate of Return (r) | Cumulative Amount of Investment Having This Rate of Return or Higher (i) |
|---|---|
| 16% | $ 0 |
| 14% | 5 |
| 12% | 10 |
| 10% | 15 |
| 8% | 20 |
| 6% | 25 |
| 4% | 30 |
| 2% | 35 |
| 0% | 40 |









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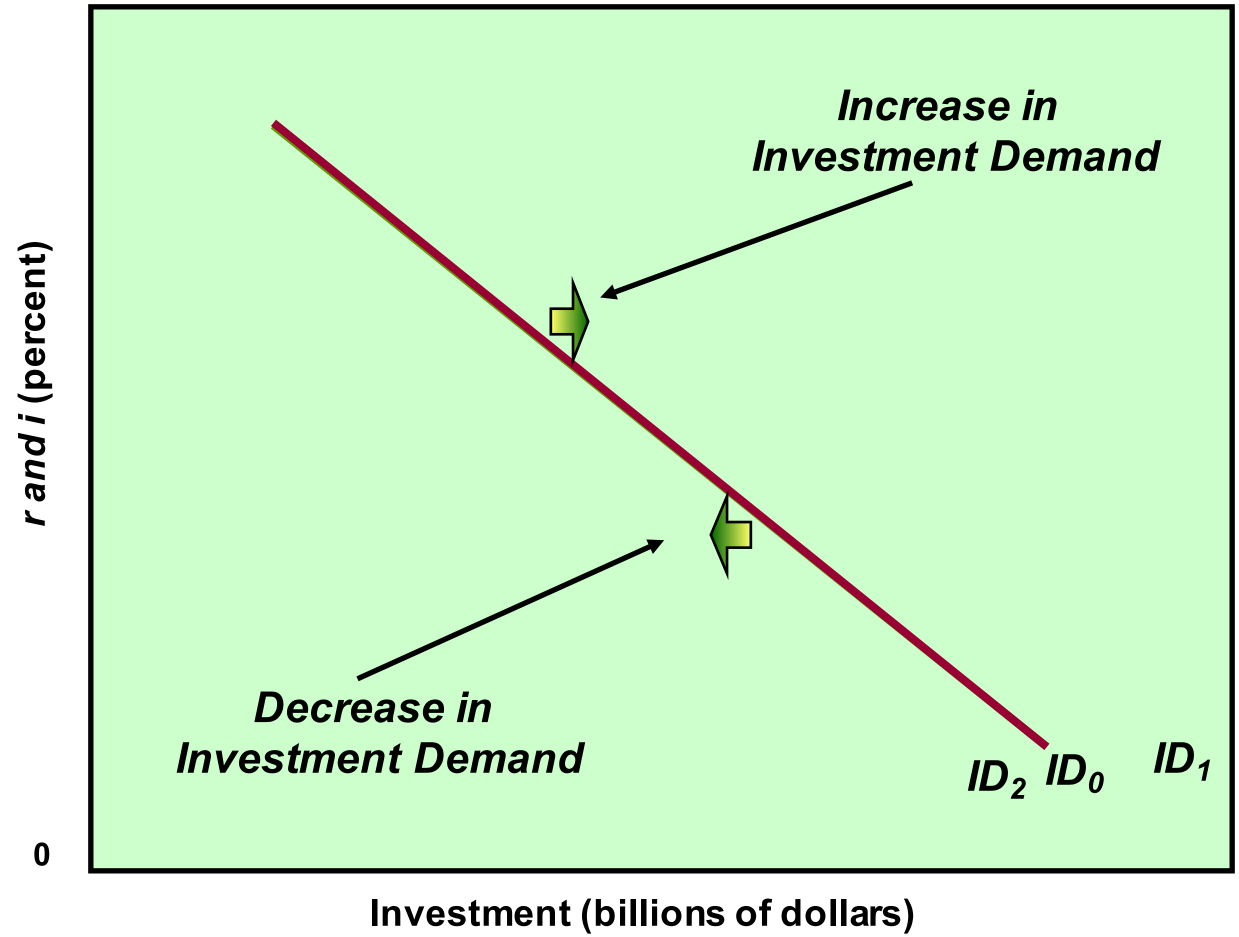
# Interest Rate and Investment

- Shifts of the Investment Demand Curve
  - Acquisition, Maintenance, and Operating Costs - if↑, the expected rate of return *(r),* falls, and the investment demand curve shifts left (decrease). Opposite also true.
  - Business Taxes – if ↑, profits drop and the *ID* curve shifts left (decrease). Opposite true
  - Technological Change – new technology stimulates investment (curve shifts right).
  - Stock of Capital Goods on Hand – if ↑ (overstocked), expected return ↓, *ID* curve shifts left. Opposite also true.
  - Expectations – optimistic predictions of profits = *ID* curve shifts right. Opposite true.

# Interest Rate and Investment

## *Shifts in the Investment Demand Curve*



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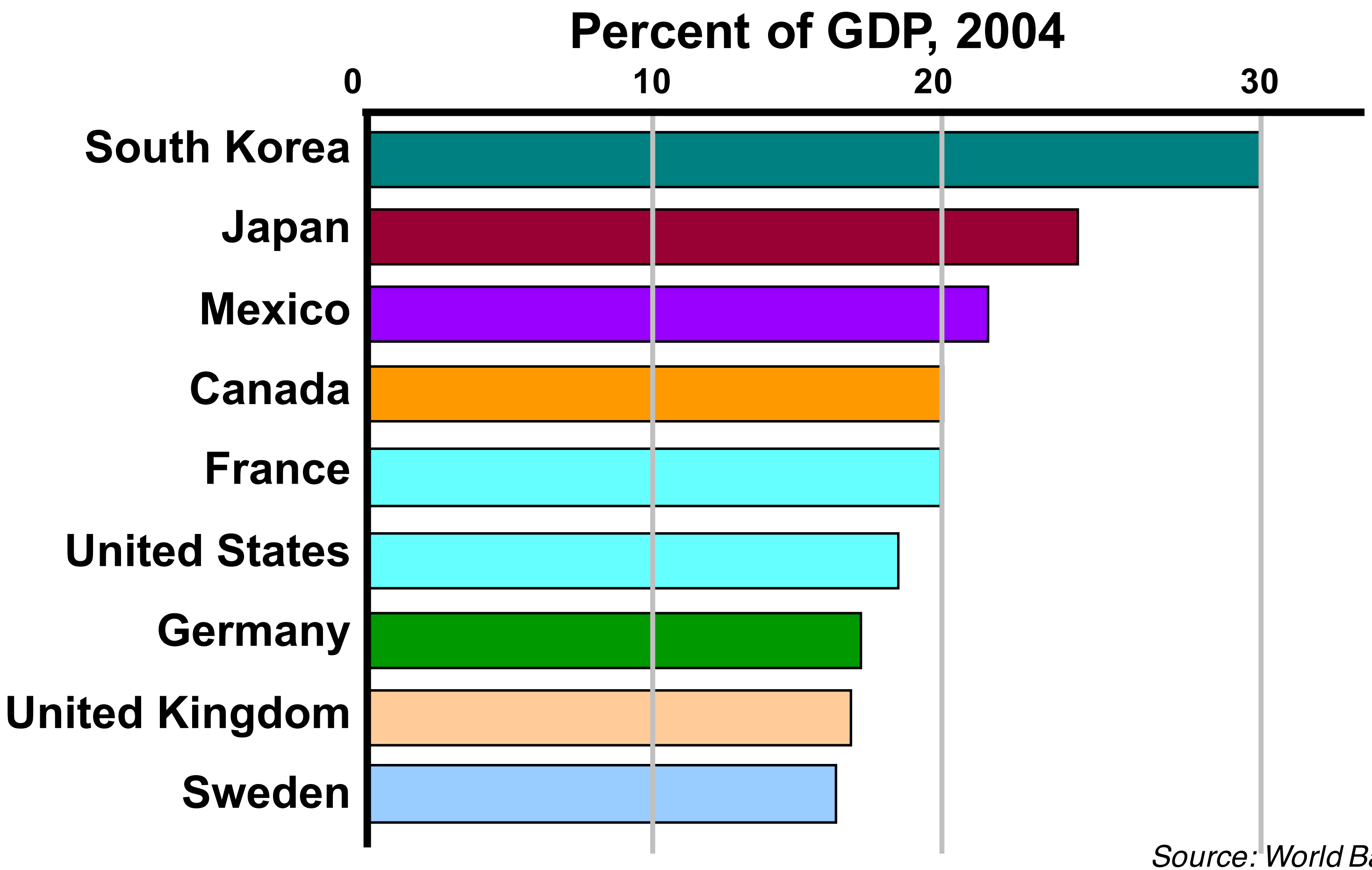
# Interest Rate and Investment

- **Instability of Investment**
  - Durability of goods give flexibility for repair vs. replacement
  - Irregularity of Innovation spurs "waves" of investment that will fade over time
  - Variability of Profits (double impact) – as profits increase firms have more money for investment AND more incentive to invest. Opposite also true.
  - Variability of Expectations – business decisions may exaggerate actual market conditions (EX – stock market swings)

# Interest Rate and Investment

## GLOBAL PERSPECTIVE

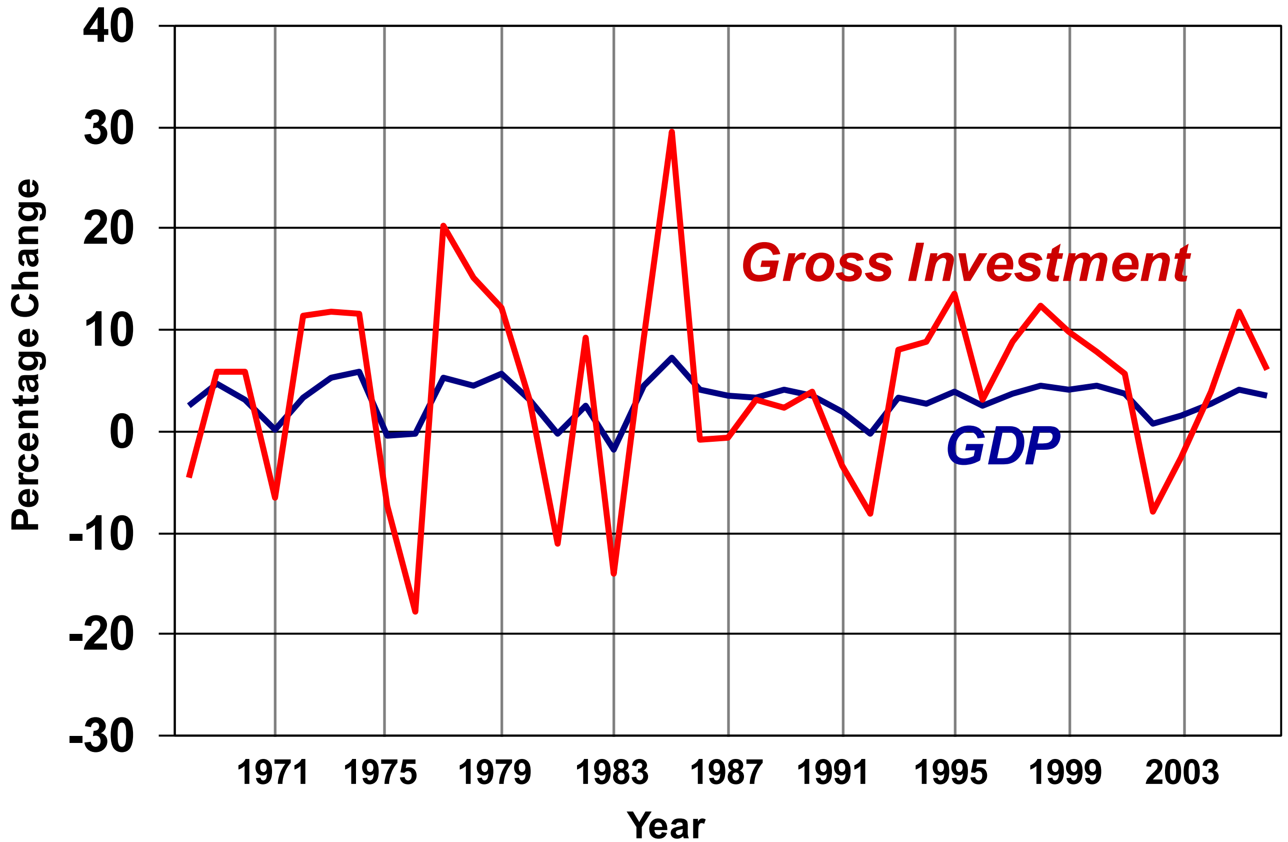
## *Gross Investment Expenditures as a Percent of GDP, Select Nations*




*Source: World Bank*

# Interest Rate and Investment

## *The Volatility of Investment*



# The Multiplier Effect

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- A change in total spending will result in a *larger* change in GDP.
- The initial change in spending sends a *ripple* effect throughout the economy.
- The *multiplier* determines how much larger the final change in GDP will be in relation to the initial change in spending.

$$\text{Multiplier} = \frac{\text{Change in Real GDP}}{\text{Initial Change in Spending}}$$

*The Multiplier and the Marginal Propensities*

$$\text{Multiplier} = \frac{1}{1 - MPC}$$

-or-

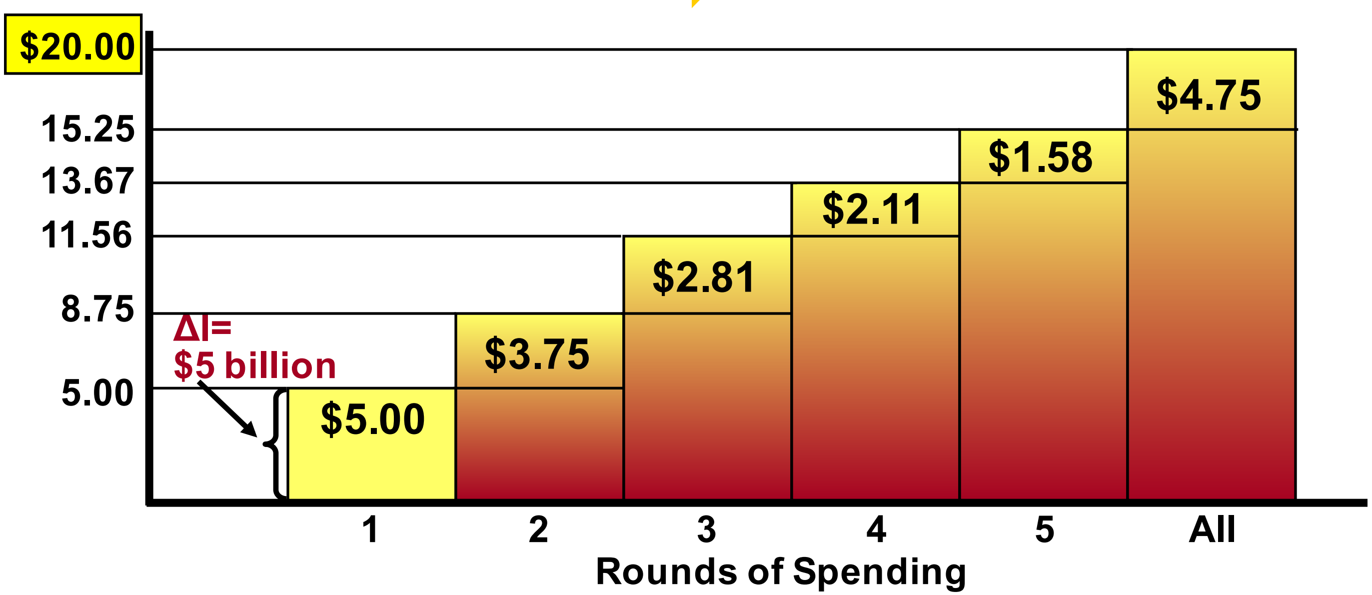
$$\text{Multiplier} = \frac{1}{MPS}$$

*Graphically...*

# The Multiplier Effect

## *Tabular and Graphical Views*

| | (1) Change in Income | (2) Change in Consumption (MPC = .75) | (3) Change in Saving (MPC = .25) |
|---|---|---|---|
| Increase in Investment of $5 | $ 5.00 | $ 3.75 | $ 1.25 |
| Second Round | 3.75 | 2.81 | .94 |
| Third Round | 2.81 | 2.11 | .70 |
| Fourth Round | 2.11 | 1.58 | .53 |
| Fifth Round | 1.58 | 1.19 | .39 |
| All other rounds | 4.75 | 3.56 | 1.19 |
| Total | $ 20.00 | $ 15.00 | $ 5.00 |



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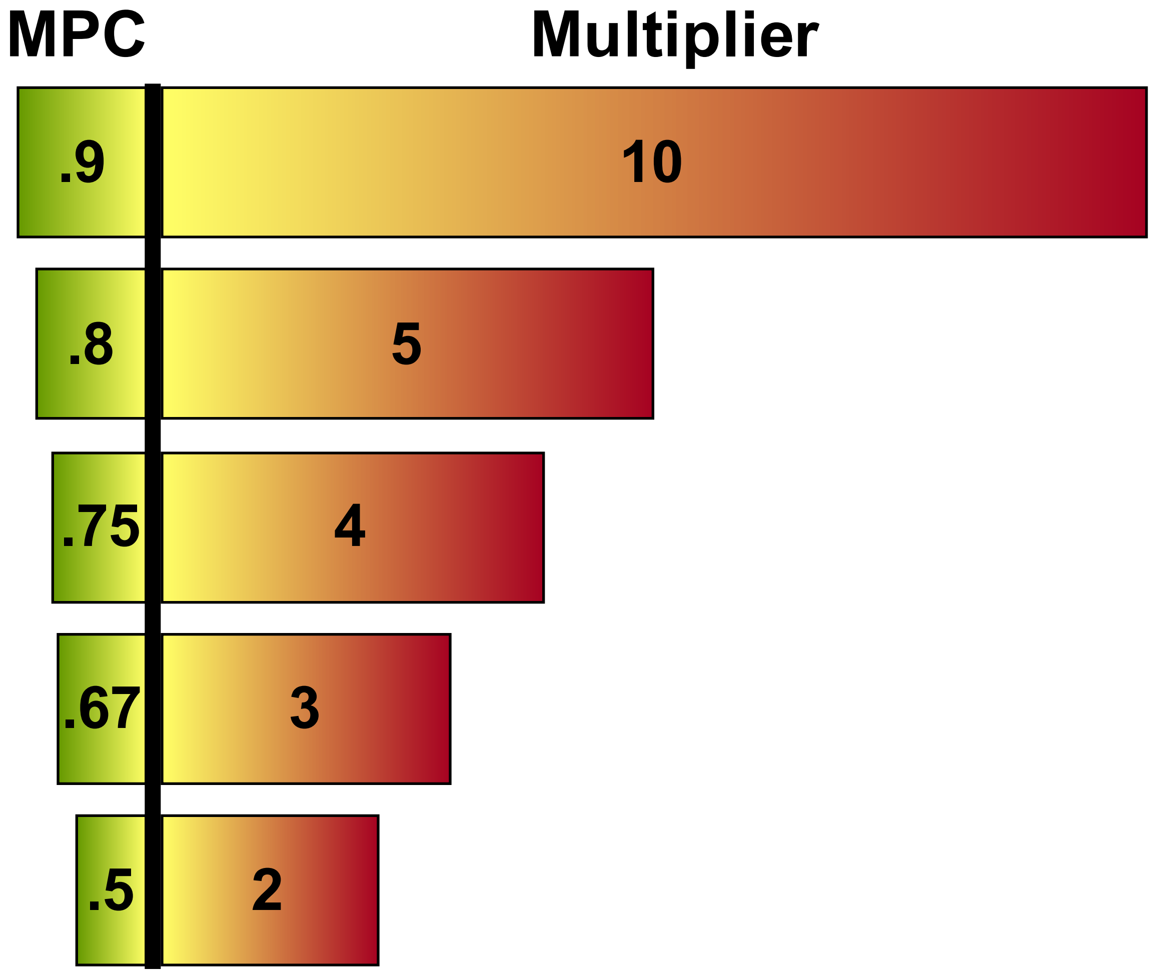
# The Multiplier Effect

## *The MPC and the Multiplier*

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# Squaring the Economic Circle

Last Word

- Humorist Art Buchwald and the Multiplier
- One Person Can’t Buy a Product
- Others Subsequently Impacted and Cannot Buy Other Items
- Multiple Effects Impact Psyche
- Ultimately Causes Multiple Step Impact Upon the Economy as a Whole





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# Key Terms

- 45° (degree) line
- consumption schedule
- saving schedule
- break-even income
- average propensity to consume (APC)
- average propensity to save (APS)
- marginal propensity to consume (MPC)
- marginal propensity to save (MPS)
- wealth effect
- expected rate of return
- investment demand curve
- multiplier

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# Next Chapter Preview…

## The Aggregate Expenditures Model

Chapter 9!