

# The Power of Macroeconomics

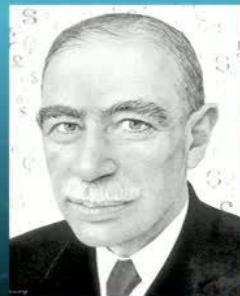
## Lecture Three: The Keynesian Model & Fiscal Policy



Presented By:  
Professor Peter Navarro  
University of California-Irvine

### Purpose Of This Lesson

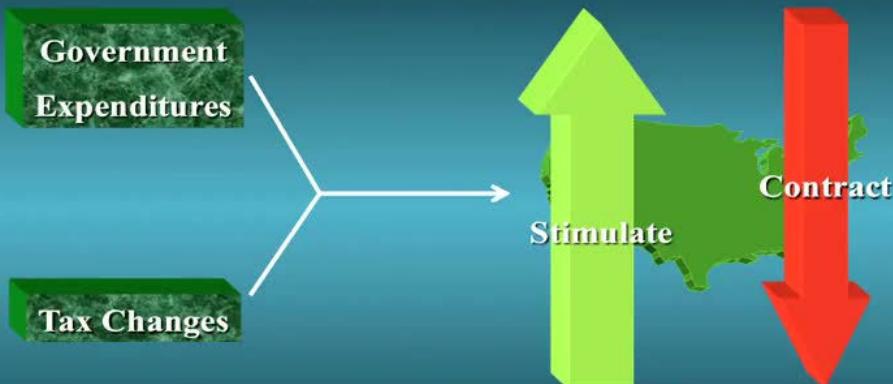
1. Illustrate the basic Keynesian model
2. Introduce the tool of Fiscal Policy



## A Model With Many Names

- Some economists refer to the Keynesian model as the “multiplier model”
- Others call it the aggregate production-aggregate expenditures model.
- We will use these names interchangeably as we illustrate how the Keynesian model gave birth to fiscal policy.

## Fiscal Policy



## The Basic Keynesian Model

- A straightforward approach to using fiscal policy to close a recessionary gap.
- The theoretical model may be used to exactly calculate how much government spending must be increased, or how much taxes must be cut, to stimulate an economy back to full employment.

## A Warning

- Macroeconomics is not this simple.
- The harsh reality:
  - Economists learned in the 1970s within the context of stagflation that Keynesian solutions don't always work!

This was President Gerald Ford's slogan.

His Keynesian efforts to "whip inflation" only drove the economy deeper into recession!



## In Future Lessons

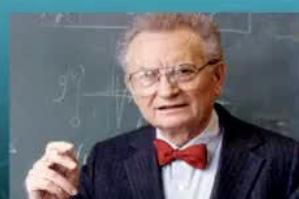
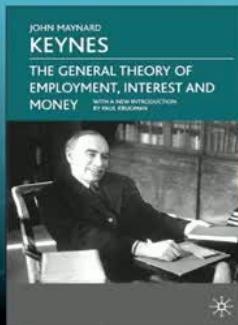
- We'll talk more about stagflation and the complexities of macroeconomics later.
- For now, let's master the simple Keynesian model and fiscal policy.

## Keynes' General Theory

- Keynes' book contains little resembling today's basic textbook Keynesian model.
- Professors Alvin Hansen and Paul Samuelson would transform Keynes' arcane prose into an easily understood model.



Alvin Hansen



Paul Samuelson

## Hansen's Role in the Keynesian Model

- Alvin Hansen was a Classical economist.
  - Left the University of Wisconsin for Harvard.
  - Converted to Keynesianism.
  - Led a Harvard seminar about the Keynesian doctrine.
- Hansen took regular trips to Washington, D.C. to spread the Keynesian gospel to policymakers.

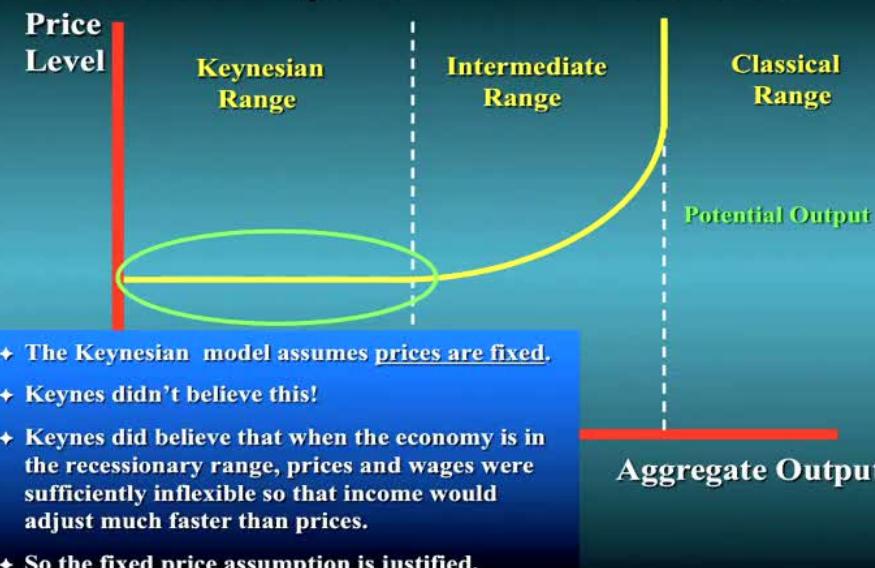


## Alvin Hansen's "A Guide to Keynes"

- The bible for economic students in the 1950s.
- Hansen's star pupil Paul Samuelson wrote the definitive macroeconomic textbook.
- Out of these writings has emerged the basic Keynesian model.



## The Assumption Of Fixed Prices

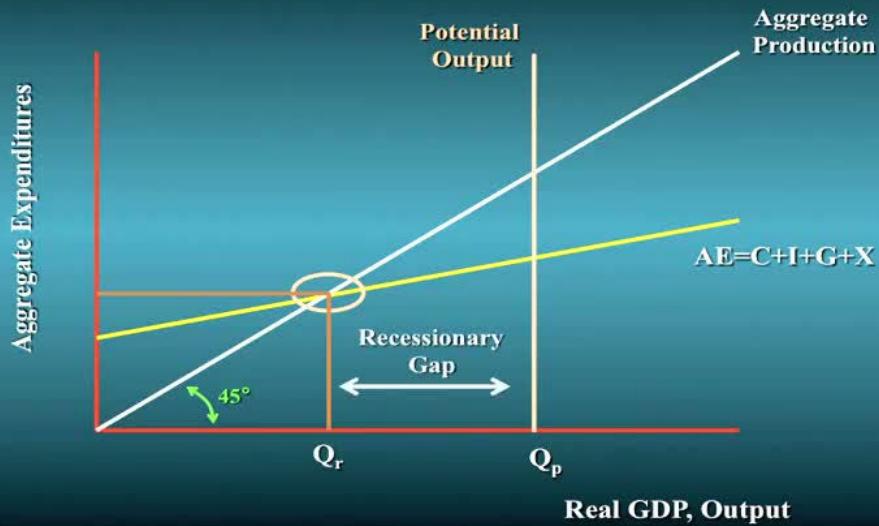


- The Keynesian model assumes prices are fixed.
- Keynes didn't believe this!
- Keynes did believe that when the economy is in the recessionary range, prices and wages were sufficiently inflexible so that income would adjust much faster than prices.
- So the fixed price assumption is justified.

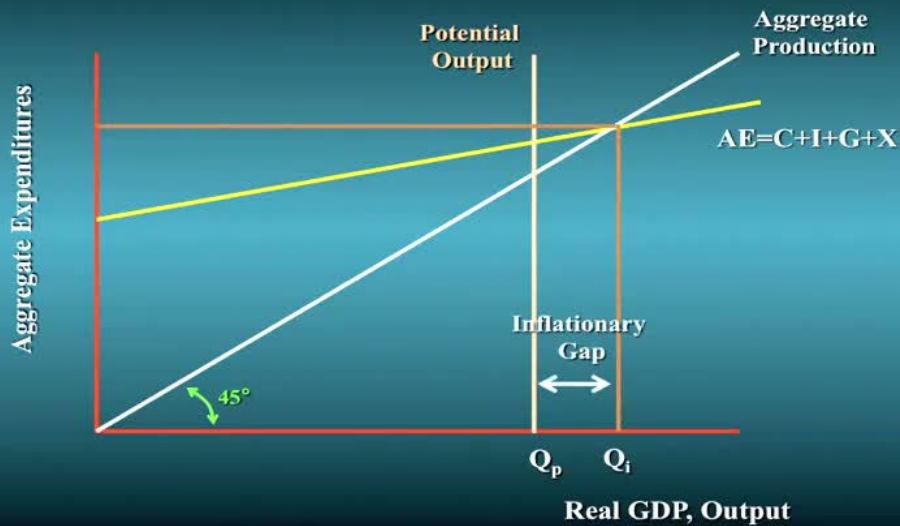
## Fixed Prices A Key Keynesian Assumption

- The fixed price assumption allowed Hansen and Samuelson to develop the Keynesian Aggregate Production-Aggregate Expenditures model.
- This Keynesian model is readily distinguishable from the Classical Aggregate Supply-Aggregate Demand model we developed in the last lecture, which allows prices to vary.

## The Keynesian Model

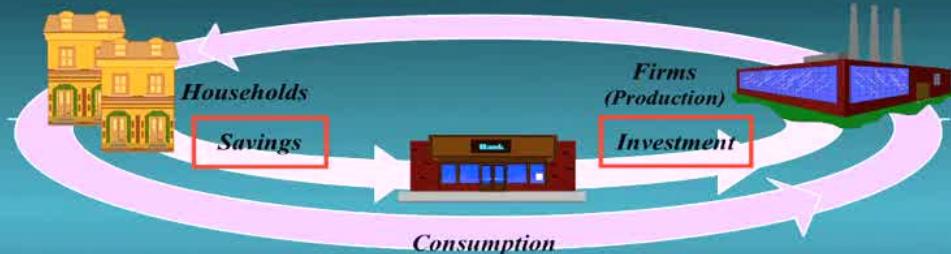


## The Keynesian Model



## Say's Law and the Circular Flow Diagram

Aggregate Supply(AS)= Employee compensation, rents, interest, and profits



Aggregate Demand (AD) = Consumption+ Investment

- ♦ A leakage is income not directly spent on domestic output but is diverted from the circular flow.
- ♦ An injection is an addition of income to the circular flow.
- ♦ Savings is a leakage while investment is an injection.

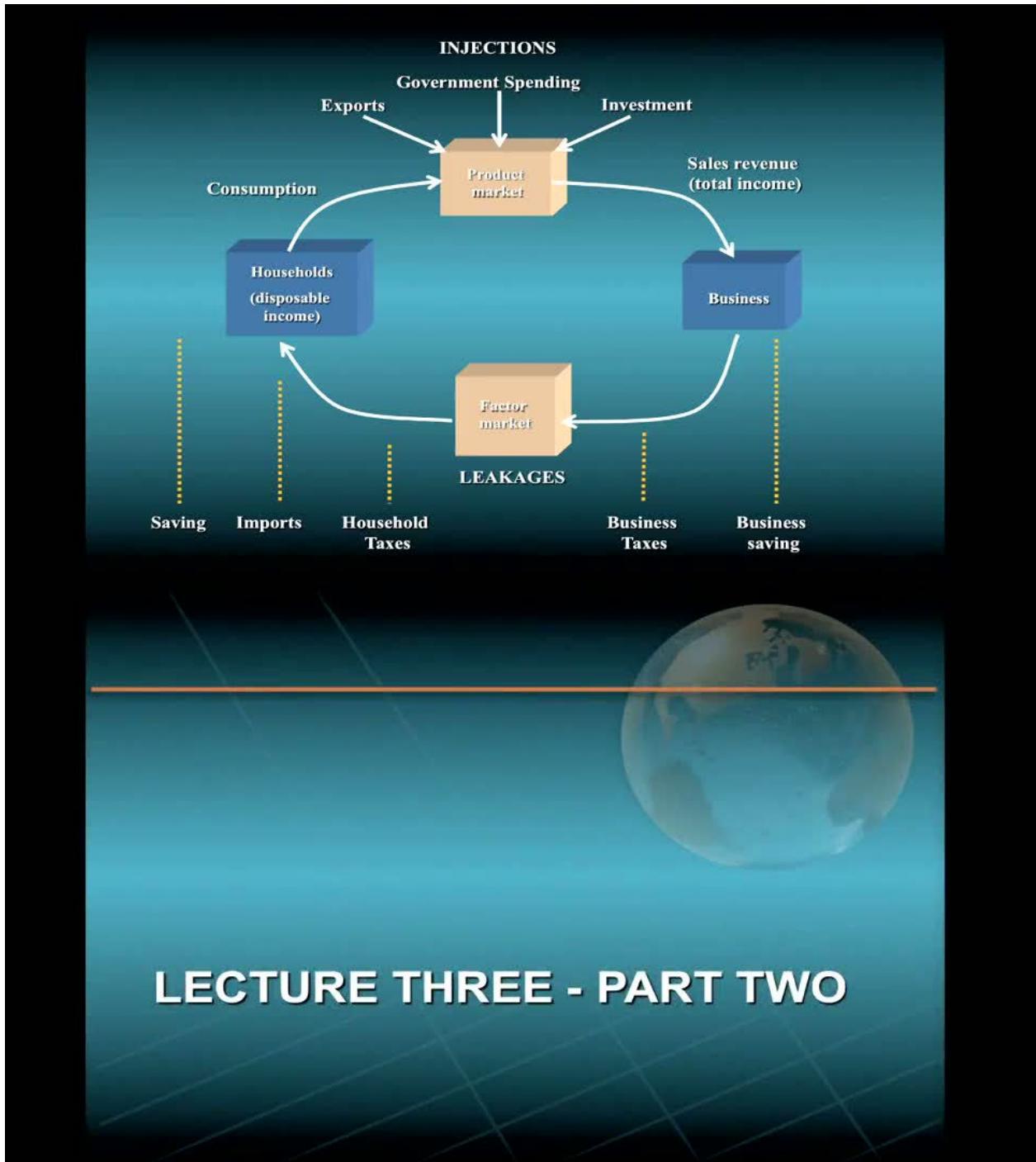
### LEAKAGES

Consumer saving  
Business saving  
Taxes  
Imports

### INJECTIONS

Investment  
Government spending  
Exports

- ♦ Taxes represent a significant leakage.
- ♦ Government spending is an important injection.
- ♦ Imports represent a critical leakage.
- ♦ Exports are an important injection.

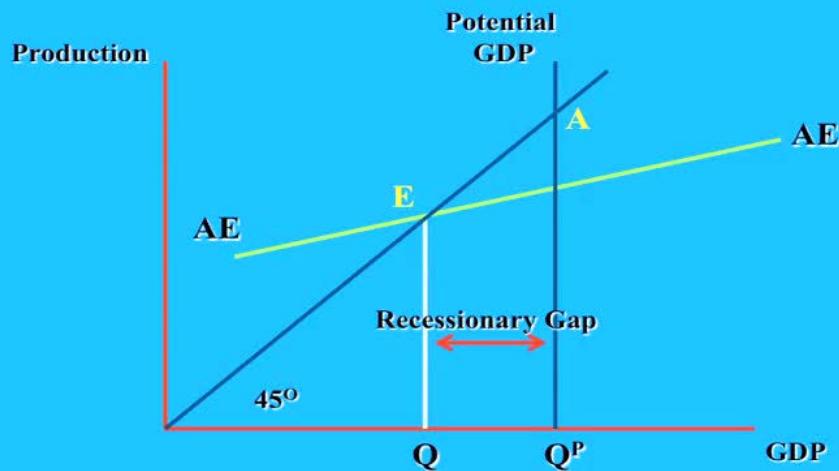


## **ANALYSIS OF THE KEYNESIAN MODEL**

### **Aggregate Production**

- The total amount of goods and services produced in the economy.
- Production creates an equal amount of income so the aggregate production curve is a 45° line.

## Aggregate Production



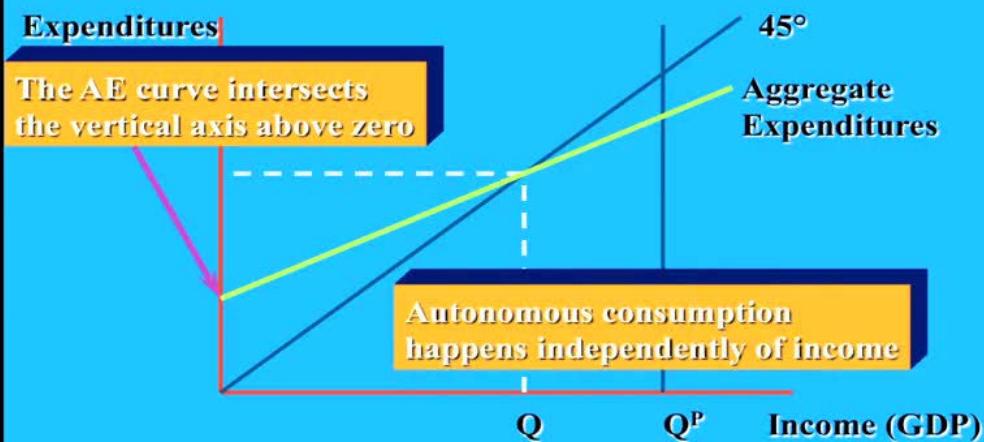
## Aggregate Expenditures

- Total spending or “aggregate expenditures” may be represented algebraically by the equation:

$$AE = C + I + G + (X - M) \rightarrow \begin{array}{l} X = \text{Exports} \\ M = \text{Imports} \end{array}$$

- The aggregate expenditures curve is simply the vertical summation of these four components.

## Aggregate Expenditures



## The Keynesian Expenditure Function

- To understand the Keynesian model, we have to understand:
  - Autonomous consumption
  - Why the AE curve is flatter than the AP curve
- Components of the Keynesian Expenditure Function
  - Consumption, investment, government expenditures, and net exports.

## Consumption

- Consumption is the largest component of aggregate expenditures.
- Consumption accounts for almost 70% of total aggregate expenditures in the U.S.



Category of consumption	Value of Category (\$, billion)	Percent of total
<b>Durable goods</b>	538	12
Motor vehicles	222	
Household equipment	212	
Other	104	
<b>Nondurable goods</b>	1,350	31
Food	658	
Clothing and apparel	237	
Energy	119	
Other	336	
<b>Services</b>	2,504	57
Housing	628	
Household operation	251	
Transportation	170	
Medical care	681	
Other	773	
<b>Total, personal consumption expenditures</b>	4,392	100

## The Keynesian Consumption Function

Total Consumption =

Autonomous Consumption Plus Induced Consumption

### Autonomous Consumption

- Autonomous consumption is that which occurs even if a person loses his or her job.
- Unemployed people dip into their savings to consume.

#### AUTONOMOUS CONSUMPTION

The level of consumption that occurs regardless of changes in one's income.



## Induced Consumption

- “Induced consumption” depends on an individual’s disposable income.

### DISPOSABLE INCOME

The amount of money left after paying taxes to the government.

## Marginal Propensity To Consume (MPC)

- Keynes described this behavior in terms of a person’s “*marginal propensity to consume*.”

The “MPC” is the extra amount people consume when they receive an extra dollar of disposable income.

## Marginal Propensity To Save (MPS)

The MPS measures the extra amount people save when they receive an extra dollar of disposable income.

$$MPS = 1 - MPC$$

## An MPC and MPS Example

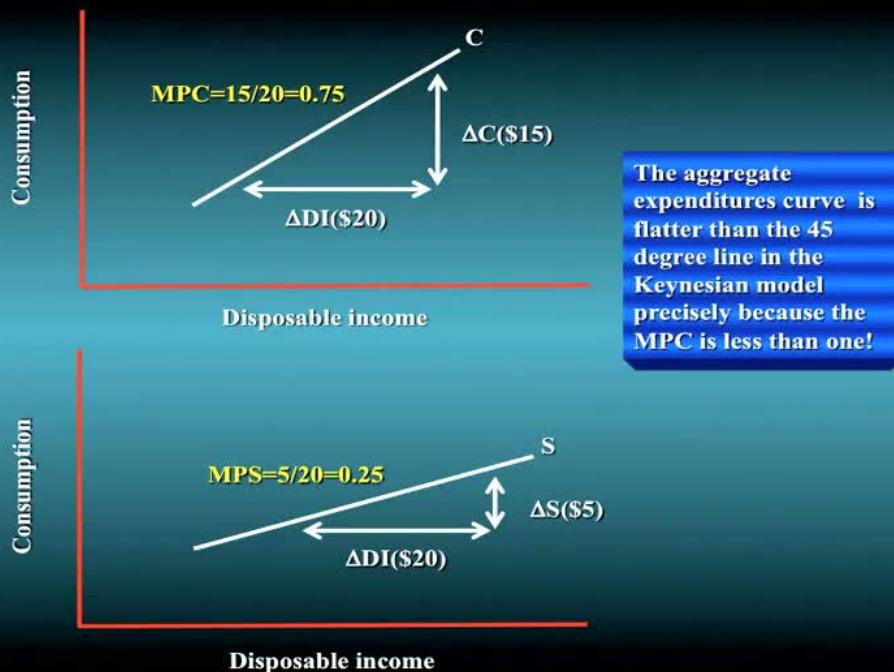
- Suppose people spend 75 cents of every dollar of their disposable income and save 25 cents.
- What is the MPC?
- What is the MPS?

## Another MPC and MPS Example

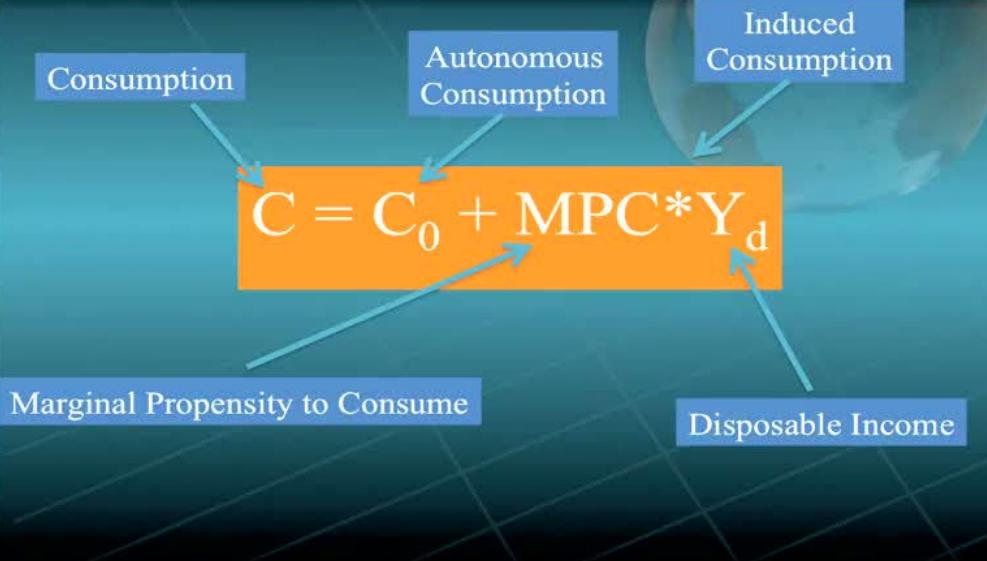
- The MPC is .75 and the MPS is .25

Now suppose people spend 90 cents and save only 10 cents of every dollar? What's the MPC and MPS??

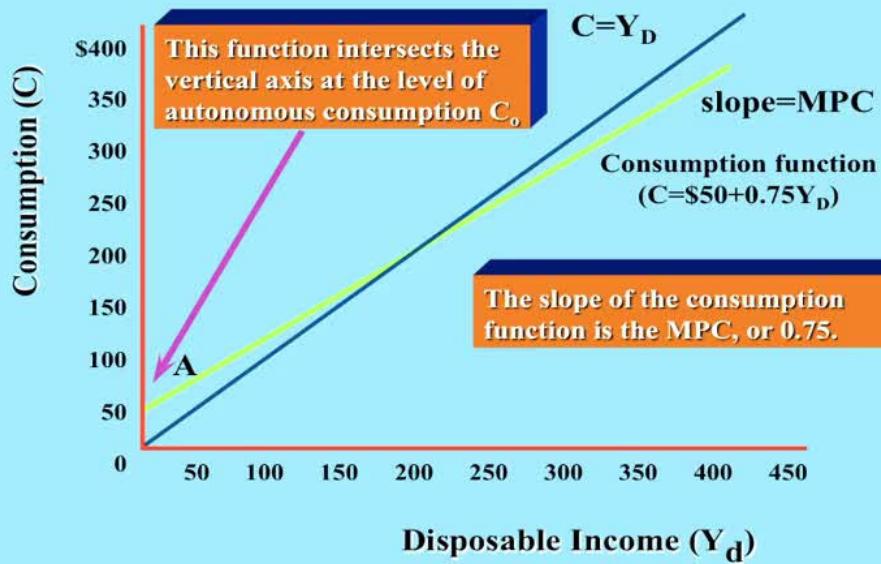
- The MPC is .90 and the MPS .10



## The Algebra of the Consumption Function

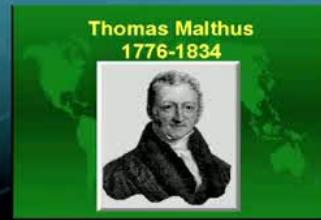


## The Consumption Function



## **Malthus' Critique of Say's Law Redux**

- You can see how this consumption function relates back to Thomas Malthus' critique of Say's Law and the Classical model.
- People won't spend everything they earn.
- Aggregate expenditures need not equal aggregate production, that is, supply might not create its own demand.



**LECTURE THREE - PART THREE**



## THE KEYNESIAN INVESTMENT FUNCTION

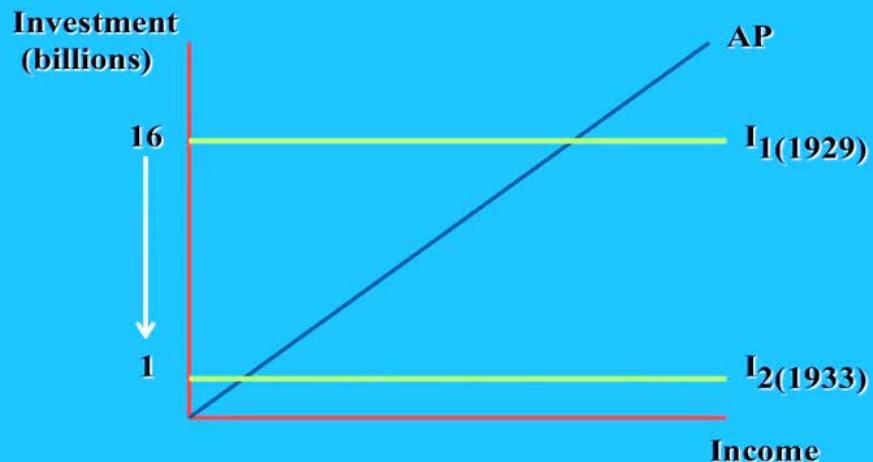
### Components of Investment

- Investment expenditures include:
  - Purchases of residential structures,
  - Investment in business plant and equipment,
  - Additions to a company's inventory.
- Investment in plant and equipment is biggest category:
  - 70 percent of total investment annually.
  - Total investment expenditures account for roughly 15 percent of total aggregate expenditures.

## Algebra of the Investment Function

- Investment expenditures are assumed to occur independently of the level of income.
  - This assumption is for simplicity.
- Algebraically, this assumption means that  $I$  is equal to autonomous investment,  $I_o$ .
- Therefore, the investment function may be represented as a horizontal line.

## The Investment Function



## Determinants of Investment?

- Keynes believed investment was sensitive to changes in the interest rate.



## Keynes vs. the Classicals Redux

- Keynes did not believe that falling interest rates and increased investment would necessarily lead to a full employment equilibrium like the Classical economists did.

## **Keynes's Animal Spirits**



- Investment is driven by “animal spirits.”
  - These are the “expectations” businesses have regarding potential sales and profits.
- If businesses believe the economy will go bad, it could become a self-fulfilling prophecy.
  - Businesses with a bearish view of the economy would cut back on investment and production and help trigger a recessionary spiral.



## **THE GOVERNMENT EXPENDITURE FUNCTION**

## Government Expenditures

- Government purchases of equipment like tanks and road-building equipment.
- Payment for services of judges and public school teachers.
- The government expenditure function is determined directly by the government's own decisions.
- For example, the Pentagon's purchase of a new jet fighter adds directly to the gross domestic product or GDP.

## The Government Expenditure Function

- Government expenditures account for almost 20% of total aggregate expenditures.
- The Keynesian model assumes  $G$  to be autonomous, i.e., determined outside the model.
  - Thus,  $G$  equals autonomous government expenditures  $G_0$ .
- As with the investment function, the government expenditure function can be graphically portrayed as a horizontal line.

## **Volatility of Government Expenditures**

- Government expenditures are less volatile than investment.
- Episodic events such as wars and natural disasters can lead to large fluctuations in G.



## **Keynesian Fiscal Policy**

- In the Keynesian model, increased or decreased government expenditures, together with tax cuts or tax increases, serve as the primary tools of fiscal policy that are used to counterbalance changes in investment and consumption spending.

## **Applied Fiscal Policy**

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- **Expansionary fiscal policy:**
  - Increase G and/or cut T to close a recessionary gap.
- **Contractionary fiscal policy:**
  - Cut G and/or raise T to cool down an overheated economy and curb inflation.

## **Transfer Payments are Automatic Stabilizers**

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- “Transfer payments” include unemployment compensation, welfare payments, and subsidies.
- Transfer payments are “automatic stabilizers:
  - They help stabilize the economy because they automatically rise during recessions and fall during expansions.
- For example, during recessions, as more people become unemployed, they become eligible for these programs.
- In contrast, as the economy expands, there is less need for welfare payments.

## THE NET EXPORTS FUNCTION

### What We Export

- “Net Exports” represent the difference between the exports we sell to the world and the foreign imports we buy.
- U.S. exports range from the sale of aircraft to China and beef and oranges to Europe and medical equipment to Canada.



## What We Import



## Exports Add to GDP, Imports Subtract

- Exports create domestic production, income, & employment for an economy.
  - Exports add to aggregate expenditures.
- Buying imports means no production, income, or employment is created.
  - Imports subtract from aggregate expenditures.

## **Net Exports Assumed Away in Simple Keynesian Model**

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- Net exports are a critical part of an “open” economy, but they were not central to the development of the Keynesian model.
- The simplified Keynesian model assumes a “closed economy” in which there is no international trade!!!
- This assumption allows us to focus solely on the role of government spending in fiscal policy.

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## **LECTURE THREE – PART FOUR**

## **Summarizing the Keynesian Model**

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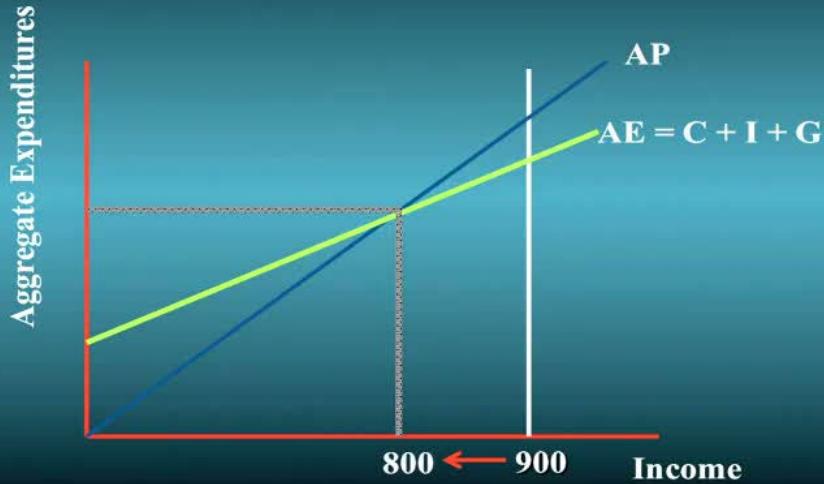
- The consumption function slopes upward.
- The slope of the consumption function is flatter than the aggregate production curve.
- Both the investment and government expenditure functions are represented by horizontal lines.

## **The Slope of the Aggregate Expenditures Function is the MPC**

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- Vertically summing the consumption, investment, and government expenditure curves yields the AE function.
- The slope of the AE function is the same as the slope of the consumption function because the investment & government expenditure functions are horizontal lines.
- Therefore, the slope of the AE function is the marginal propensity to consume or MPC!

## The Complete AE Curve Graphed

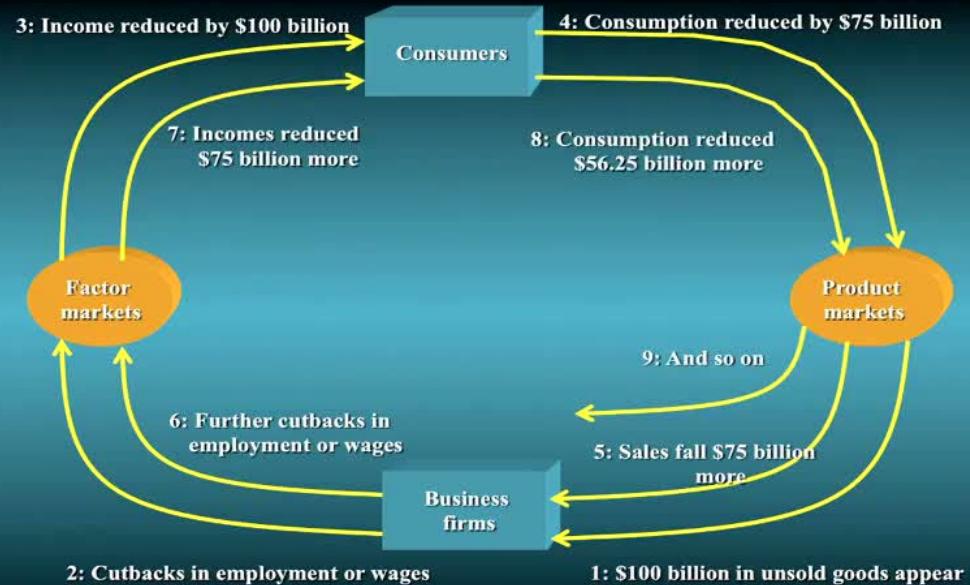


### Closing a Recessionary Gap

- We can demonstrate that expansionary fiscal policy can be used to close a \$100B recessionary gap.
- Before we can do this, we have to master one more concept:
  - The "Keynesian expenditure multiplier"

## The Keynesian Multiplier

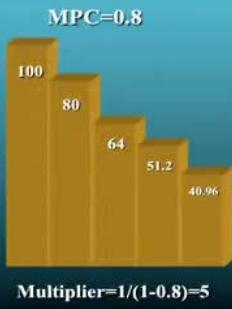
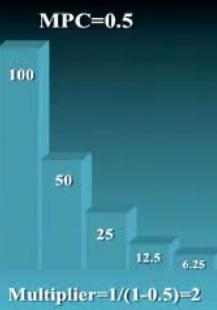
- The number by which a change in aggregate expenditures must be multiplied to determine the resulting change in total output.
- The Keynesian multiplier is greater than one because income is re-spent many times after the initial increase.



## Calculating the Multiplier

Keynesian multiplier =  $1/\text{MPS} = 1/(1-\text{MPC})$

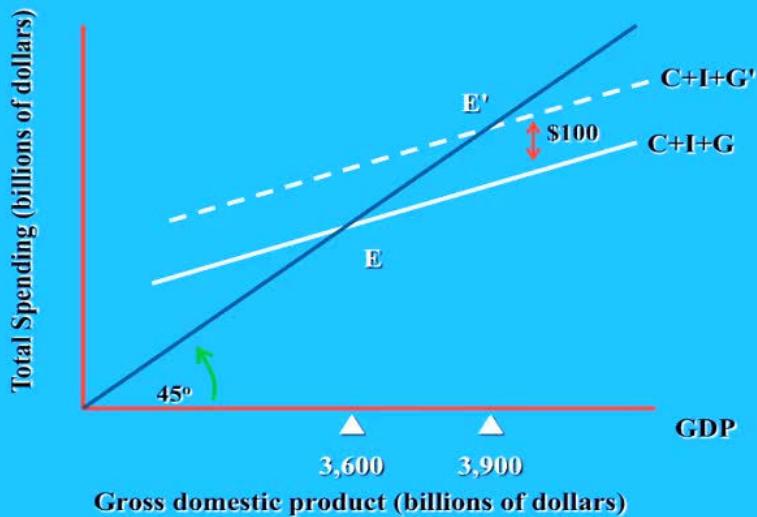
MPC	Multiplier
0.9	?
0.8	?
0.75	?
0.5	?



## How the Multiplier Works -- Example

- Suppose the U.S. permanently increases defense spending by \$100 billion in response to a threat to the oil fields in the Mideast.
- What will be the effect of this increase in G on the GDP?

## How the Multiplier Works

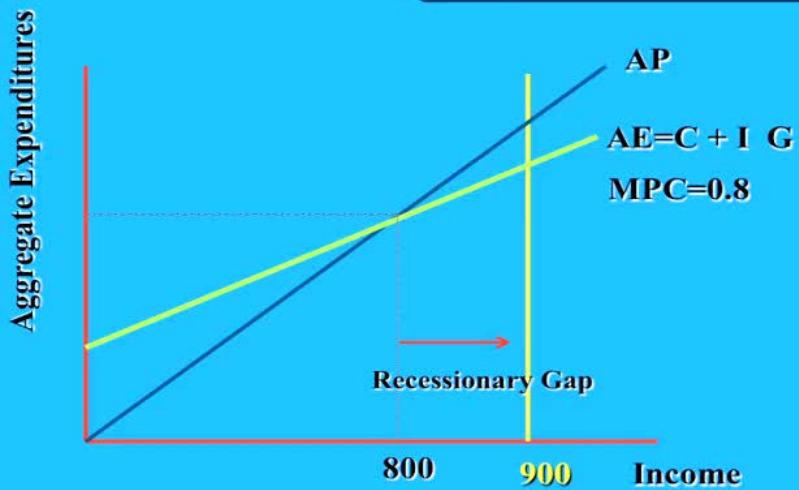


## Using the Multiplier to Close a Recessionary Gap

We have to know the multiplier to calculate exactly how much to raise government expenditures or cut taxes to close a recessionary gap!!!!

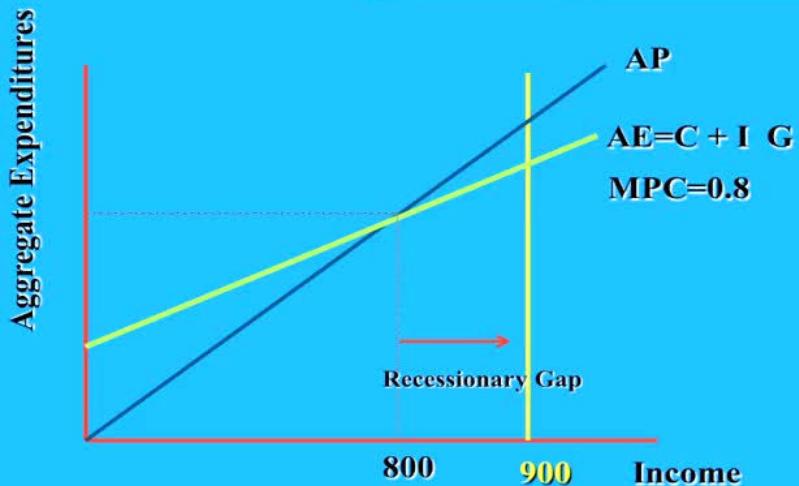
### A Recessionary Gap

- ♦ Assume MPC = 0.8
- ♦ How much must G be increased to close a gap of \$100 billion?



## A Recessionary Gap

- ◆ The multiplier is  $1/\text{MPS}$  or  $1/0.2 = 5$
- ◆ So increase  $G$  by \$20 billion to close the recessionary gap.



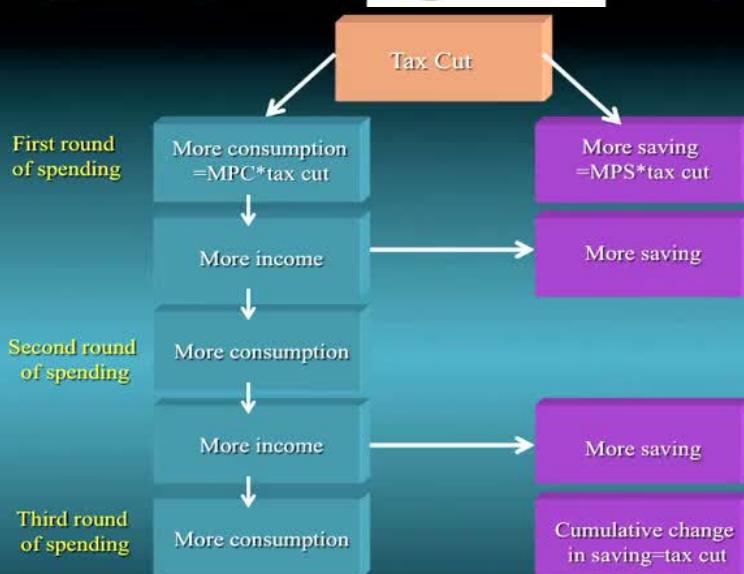
### Using Tax Cuts to Close a Recessionary Gap

- We can also use a tax cut to close a recessionary gap
  - Example: The Kennedy Tax Cut of 1964
- The tax cut multiplier is a bit more complicated than the government spending multiplier!!

**Tax cut multiplier = Expenditure multiplier \* MPC**

## The Logic of the Tax Cut Multiplier

- Tax cuts have less of an expansionary effect than an increase in government spending.
- Consumers will not increase their expenditures by the full amount of the tax cut.
- Instead, they save a portion of the tax cut based on their marginal propensity to save (MPS).



**Keynesian tax multiplier=expenditure multiplier\*MPC**

## **EXAMPLE: Using a Tax Cut To Close a Recessionary Gap**

- Assume the recessionary gap = \$100 billion
- Assume the MPC = .8
- Therefore, the multiplier = 5

### QUESTION

How much should taxes be cut to close the recessionary gap?

## **The Answer**

- Taxes must be cut by \$25B to close a \$100 billion recessionary gap.
- This is \$5B more than we needed to increase G to achieve the same result.

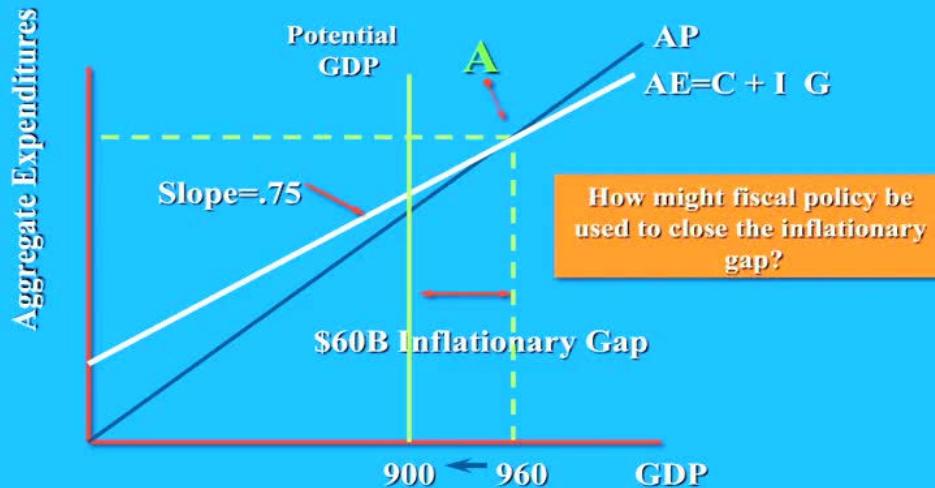
### SOLUTION

- Multiply the expenditure multiplier of 5 times the MPC.
- This yields a tax multiplier of 4.
- 4 times the \$25 billion tax cut yields a \$100 billion expansion.

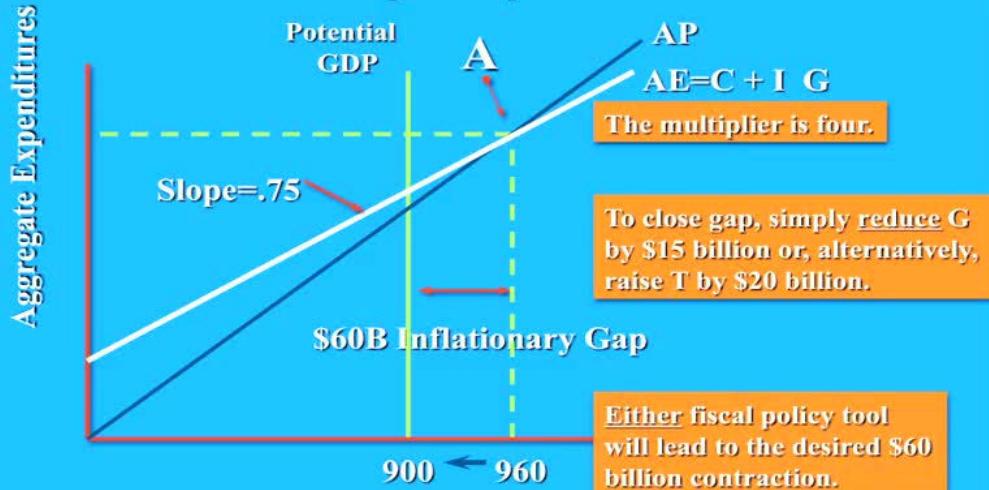
## Using Contractionary Fiscal Policy To Close An Inflationary Gap

- We know how to use expansionary fiscal policy to close a recessionary gap.
- Suppose we face an inflationary gap instead.
- A classic example is the 1960s inflationary gap caused by demand-pull inflation from the Vietnam War and Great Society expenditures.

### An Inflationary Gap

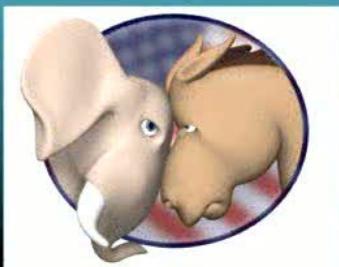


## An Inflationary Gap



## Tax Cuts or Increased G?

- Is it more preferable to increase G or cut T to eliminate recessionary and inflationary gaps?
- The answer depends on one's view of the appropriate size of the government rather than pure economics.



## Liberals Vs. Conservatives

- Liberals/Democrats prefer increased government spending during recessions and tax increases to fight demand-pull inflation
  - This expands or preserves the size of government.
- Conservatives/Republicans want to shrink government. What type of fiscal policies do you think they prefer?

## Conservative's Fiscal Policy Choices

- Conservatives generally favor:
  - Tax cuts during recessions.
  - Government spending cuts to fight demand-pull inflation.
  - Both shrink the size of government.

## LECTURE THREE - PART FIVE

### Explaining the Great Depression

- In 1929, the economy was booming and at full employment.
- The stock market crash sent the business community into a panic.
- “Animal spirits” went from bullish to bearish.
- Businesses cut back sharply on investment and production.
- Frightened consumers cut back dramatically on consumption and MPS rose!



## **Keynes' Income Adjustment Mechanism in Action**

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- The reactions of business and consumers led to a sharp and sudden downward shift of the aggregate expenditures curve.
- Business people responded by decreasing output further.
- This depressed income and consumption.
- The economy continued its downward spiral, and eventually unemployment reached a staggering 25 percent of the workforce .

## **The Paradox Of Thrift**

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- In attempting to save more, many individual households saved less because their incomes fell as aggregate expenditures fell.
- This “paradox of thrift” can be an important contributor to recessionary events.

## Fiscal Policy (and War) to the Rescue

- With consumers saving more and spending less, businesses were also unwilling to invest no matter how low interest rates fell.
- The government stepped in with a massive dose of expansionary fiscal policy.
- FDR's New Deal followed by the dramatic spurt of WWII expenditures triggered increased consumption and investment and the economy roared back to full employment.

## Mechanistic Keynesianism

- The Keynesian model provides a very mechanistic approach to curing a recession.
- If you know what the actual GDP and full employment GDP are, you know the size of the recessionary or inflationary gap.
- If you know the MPC and therefore the multiplier, you know how much to increase or decrease G or T to close the gap.

## **It's Not This Simple**

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- If mechanistic Keynesianism worked like the simple model, none of us would have to worry about being unemployed.
- Any of us, after mastering the simple lesson of this lecture, would be qualified to serve as the President's top economic advisor!
- But it's just not this simple – even if many economists at the height of the 1960s Keynesian era thought it was!!!

## **A Key Concept: “Crowding Out”**

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- **Crowding out:** A reduction in private sector investment that can be caused by increased government spending.
- Crowding out can happen when the government borrows money to finance these expenditures.
- Such borrowing or “deficit spending” can drive up interest rates.
- Higher interest rates can, in turn, reduce private sector investment.

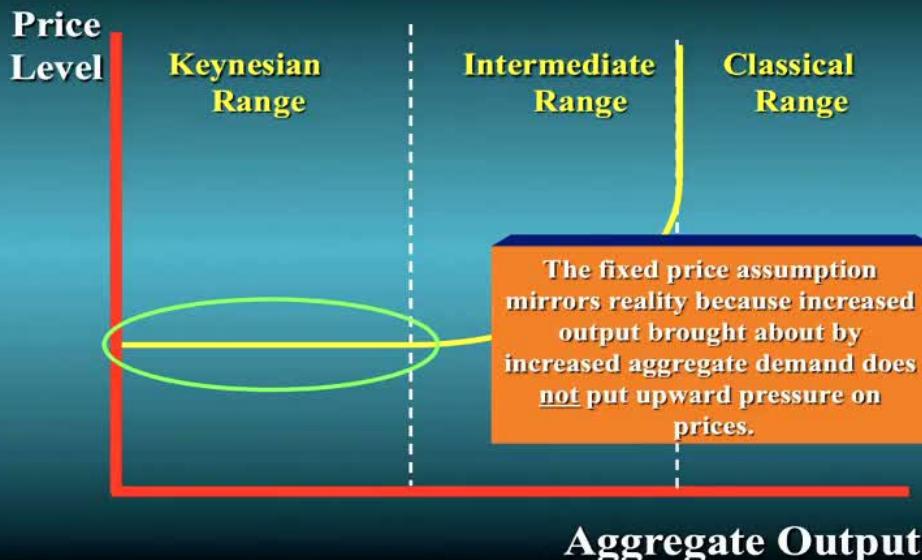
## Crowding Out Reduces the Effect of Fiscal Policy

- Any fiscal policy stimulus may be partly or fully offset by a reduction in private sector demand because of crowding out.
- Therefore, the net expansionary effect of fiscal policy might be smaller than intended!!

## The Achilles Heel of the Keynesian Model

- Here's a much broader problem with the mechanistic Keynesian approach:
  - It relies on a model that is incomplete.
  - It ignores the monetary and financial sector.
  - It assumes a closed economy.

## Three Ranges of the Economy



## Aggregate Output

### The Power of the Keynesian Model

- The Keynesian model is also useful analytically to illustrate how a small imbalance between leakages and injections can multiply into a much larger unemployment or inflation problem.

## A Key Weakness – The Fixed Price Assumption

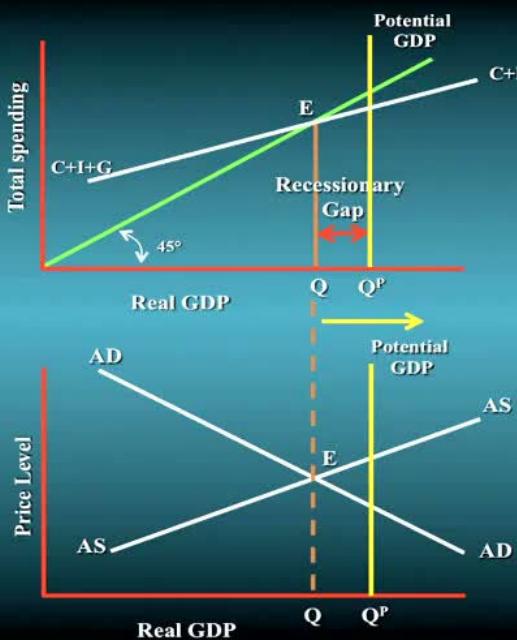
- The Keynesian model assumes away inflation.
- The Keynesian model thereby neglects the crucial influence of monetary factors on interest rates and interest-sensitive components of output such as investment.

## The Key Strength Of The AD/AS Model

- The AS-AD model illustrates both price levels and real output.

### QUESTION

What is the relationship between the Keynesian aggregate expenditures-aggregate production model and the Classical aggregate supply-aggregate demand model?



The economy is in the intermediate range so that if fiscal policy is used to close the recessionary gap, some inflation results.

If fiscal policy tries to push the economy beyond  $Q^P$  into the classical range, the primary result will be inflation.

## Coming Up Next!

Lesson Four:  
The Federal Reserve & Monetary Policy

### PLEASE REMEMBER

- Economics is not something to be memorized but rather conceptualized.
- As you study it, think about it too!!!!