Chapter 11

Classical and Keynesian Macro Analyses

Introduction

The most commonly used gauge of volatility in U.S. financial markets is the VIX index.

During the severe 2008 – 2009 recession, the VIX index increased substantially, indicating significant variability in the value of financial claims and interest rates.

How can disturbances in financial markets sometimes translate into reductions in real GDP and perhaps even into a decline in the overall price level?

In Chapter 11, you will develop an understanding of how to answer this question by learning about how the equilibrium price level is determined in the short run.

Learning Objectives

- Discuss the central assumptions of the classical model
- Describe the short-run determination of equilibrium real GDP and the price level in the classical model
- Explain the circumstances under which the short-run aggregate supply curve may be either horizontal or upward sloping

Learning Objectives (cont'd)

- Understand what factors cause shifts in the short-run and long-run aggregate supply curves
- Evaluate the effects of aggregate demand and supply shocks on equilibrium real GDP in the short run
- Determine the causes of short-run variations in the inflation rate

Chapter Outline

- The Classical Model
- Keynesian Economics and the Keynesian Short-Run Aggregate Supply Curve
- Output Determination Using Aggregate Demand and Aggregate Supply: Fixed versus Changing Price Levels in the Short Run

Chapter Outline (cont'd)

- Shifts in the Aggregate Supply Curve
- Consequences of Changes in Aggregate Demand
- Explaining Short-Run Variations in Inflation

Did You Know That …

- The price of a 6.5 oz bottle of Coca-Cola remained unchanged at 5 cents from 1886–1959?
- Prices of final goods and services have not always adjusted immediately in response to changes in aggregate demand.
- The classical model and the Keynesian approach help in understanding variations in real GDP and the price level.

The Classical Model

- The classical model was the first attempt to explain:
  - Determinants of the price level
  - National levels of real GDP
  - Employment
  - Consumption
  - Saving
  - Investment

The Classical Model (cont'd)

- Classical economists—Adam Smith, J.B. Say, David Ricardo, John Stuart Mill, Thomas Malthus, A.C. Pigou, and others—wrote from the 1770s to the 1930s
- They assumed wages and prices were flexible, and that competitive markets existed throughout the economy

The Classical Model (cont'd)

- Say's Law
  - A dictum of economist J.B. Say that supply creates its own demand
  - Producing goods and services generates the means and the willingness to purchase other goods and services
  - *Supply creates its own demand; hence it follows that* desired *expenditures will equal* actual *expenditures*

Figure 11-1 Say's Law and the Circular Flow

The Classical Model (cont'd)

- Assumptions of the classical model
  - Pure competition exists
  - Wages and prices are flexible
  - People are motivated by self-interest
  - People cannot be fooled by money illusion

The Classical Model (cont'd)

- Money Illusion
  - Reacting to changes in money prices rather than relative prices
  - If a worker whose wages double when the price level also doubles thinks he or she is better off, that worker is suffering from money illusion

The Classical Model (cont'd)

- Consequences of the assumptions
  - If the role of government in the economy is minimal;
  - If pure competition prevails, and all prices and wages are flexible;
  - If people are self-interested, and do not experience money illusion;
  - Then problems in the macroeconomy will be temporary and the market will correct itself

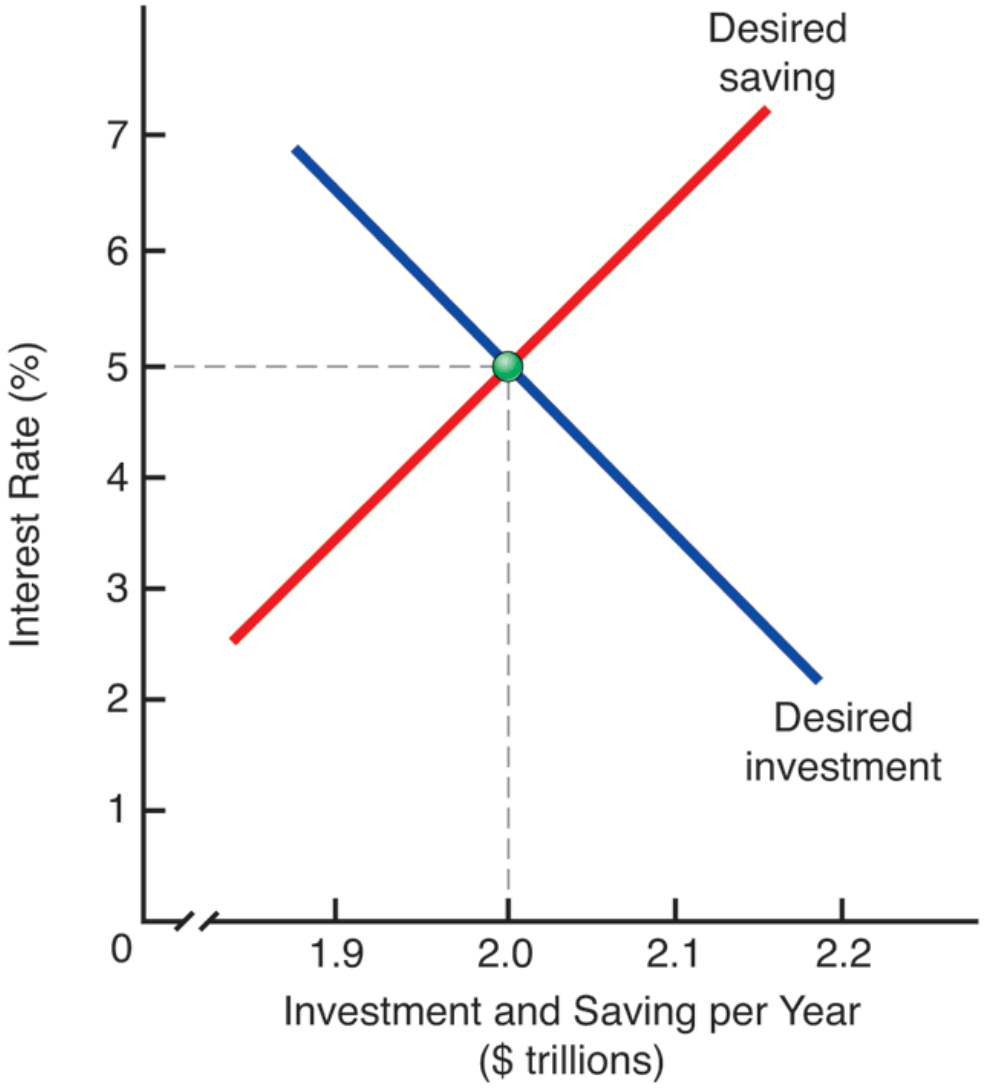
The Classical Model (cont'd)

- Equilibrium in the credit market
  - When income is saved, it is not reflected in product demand
  - It is a type of *leakage* from the circular flow of income and output, because saving withdraws funds from the income stream
  - Therefore, total planned consumption spending can fall short of total current real GDP

The Classical Model (cont'd)

- Equilibrium in the credit market
  - Classical economists contended each dollar saved would be matched by business *investment*
  - Leakages would thus equal injections
  - At equilibrium, the *price* of credit—the interest rate—ensures that the amount of credit demanded equals the amount supplied

Figure 11-2 Equating Desired Saving and Investment in the Classical Model



The Classical Model (cont'd)

- Equating Desired Saving and Investment in the Classical Model
  - Changes in saving and investment create a surplus or shortage in the short run
  - In the long run, this is offset by changes in the interest rate
  - This interest rate adjustment returns the market to equilibrium where $S = I$

The Classical Model (cont'd)

- Question
  - Would unemployment be a problem in the classical model?
- Answer
  - No, classical economists assumed wages would always adjust to the full employment level

Figure 11-3 Equilibrium in the Labor Market

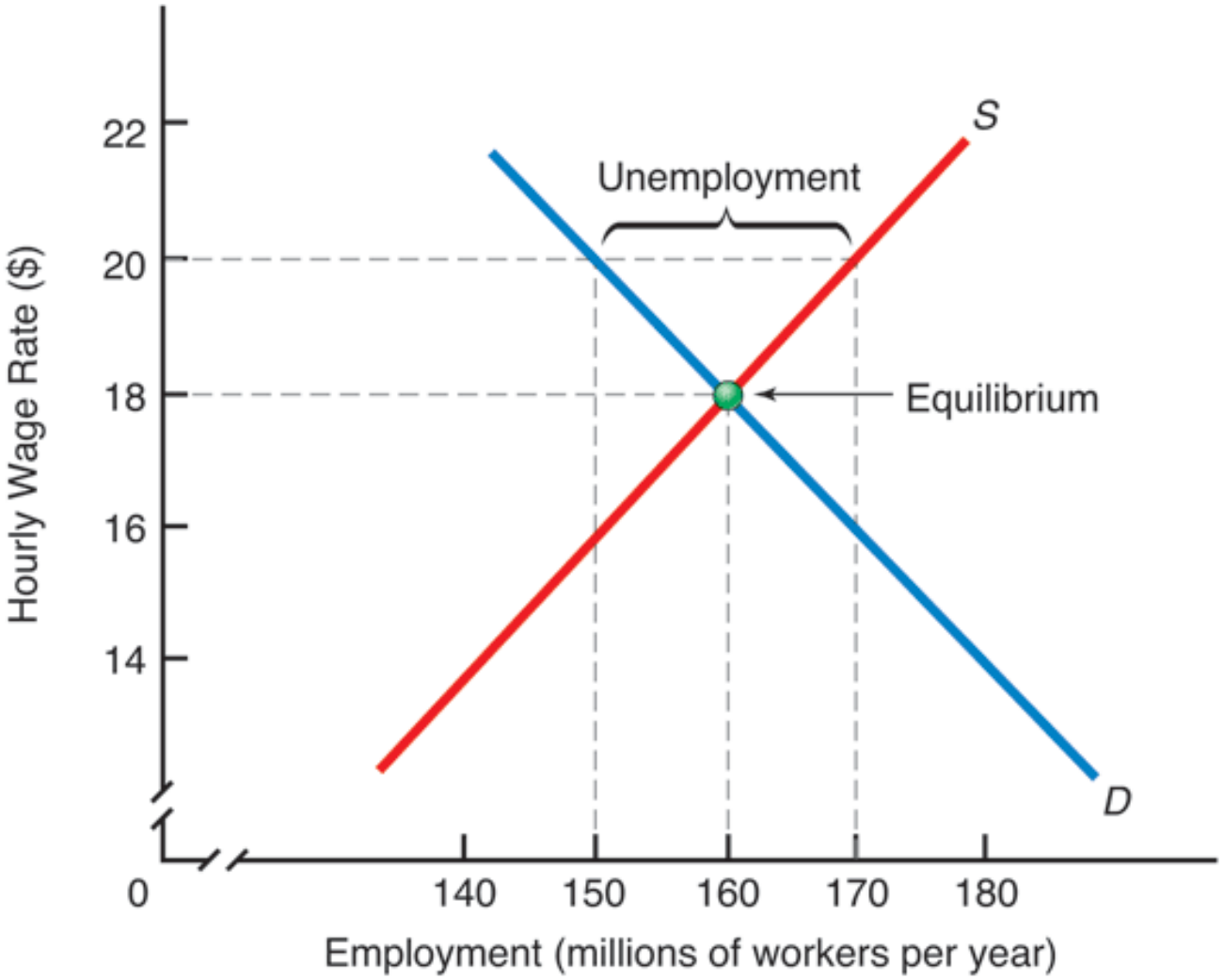


Table 11-1 The Relationship Between Employment and Real GDP

Labor Input per Year (millions of workers)	Real GDP per Year ($ trillions)
150	12
154	13
158	14
160	15
164	16
166	17

The Classical Model (cont'd)

- Classical theory, vertical aggregate supply and the price level
  - In the classical model, long-term unemployment is impossible
  - Say's law, along with flexible interest rates, prices, and wages would tend to keep workers fully employed
  - The *LRAS* curve is vertical
  - A change in aggregate demand will cause a change in the price level

Figure 11-4 Classical Theory and Increases in Aggregate Demand

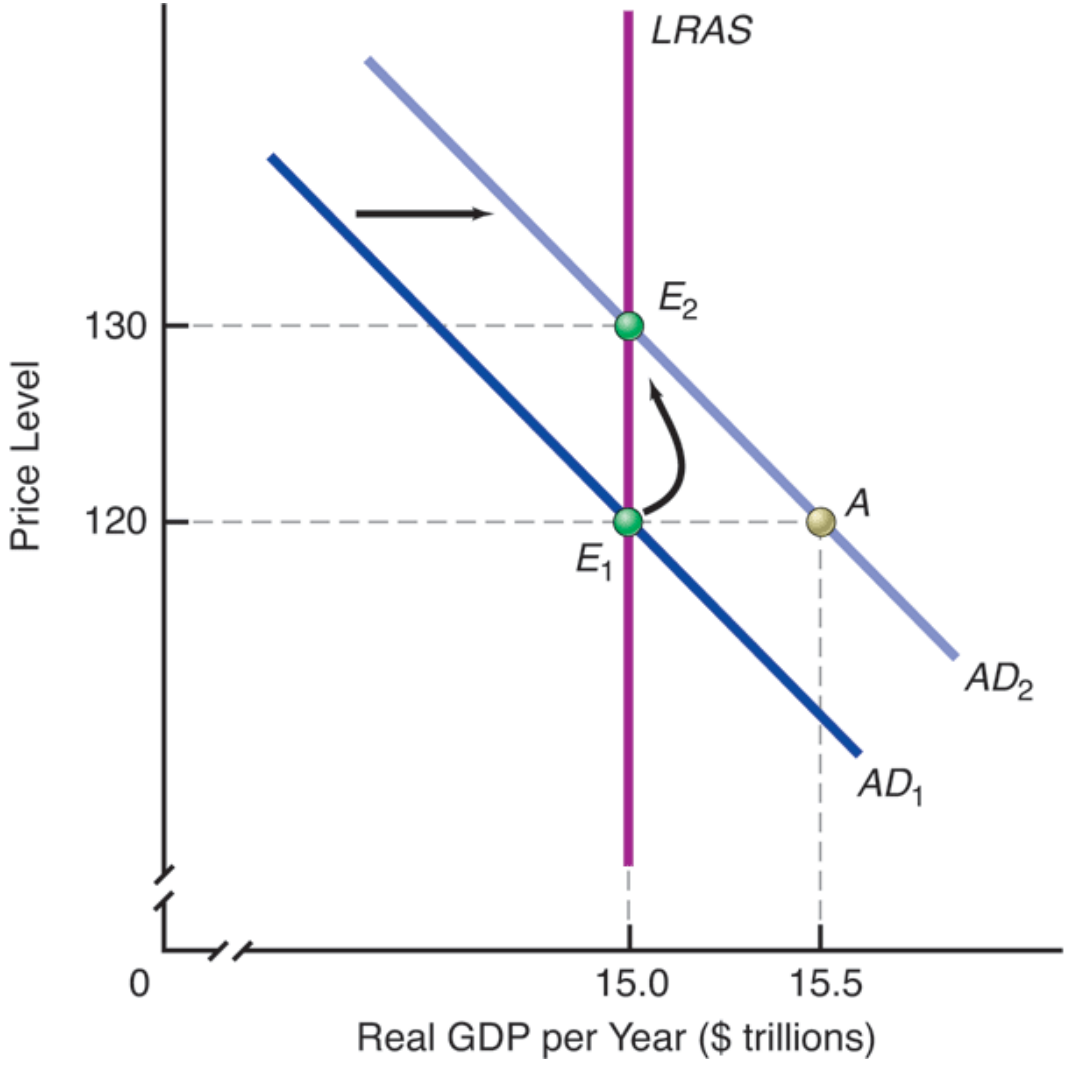


Figure 11-5 Effect of a Decrease in Aggregate Demand in the Classical Model

Keynesian Economics and the Keynesian Short-Run Aggregate Supply Curve

- The classical economists' world was one of fully utilized resources
- In the 1930s, Europe and the United States entered a period of economic decline that could not be explained by the classical model
- John Maynard Keynes developed an explanation that has become known as the Keynesian model

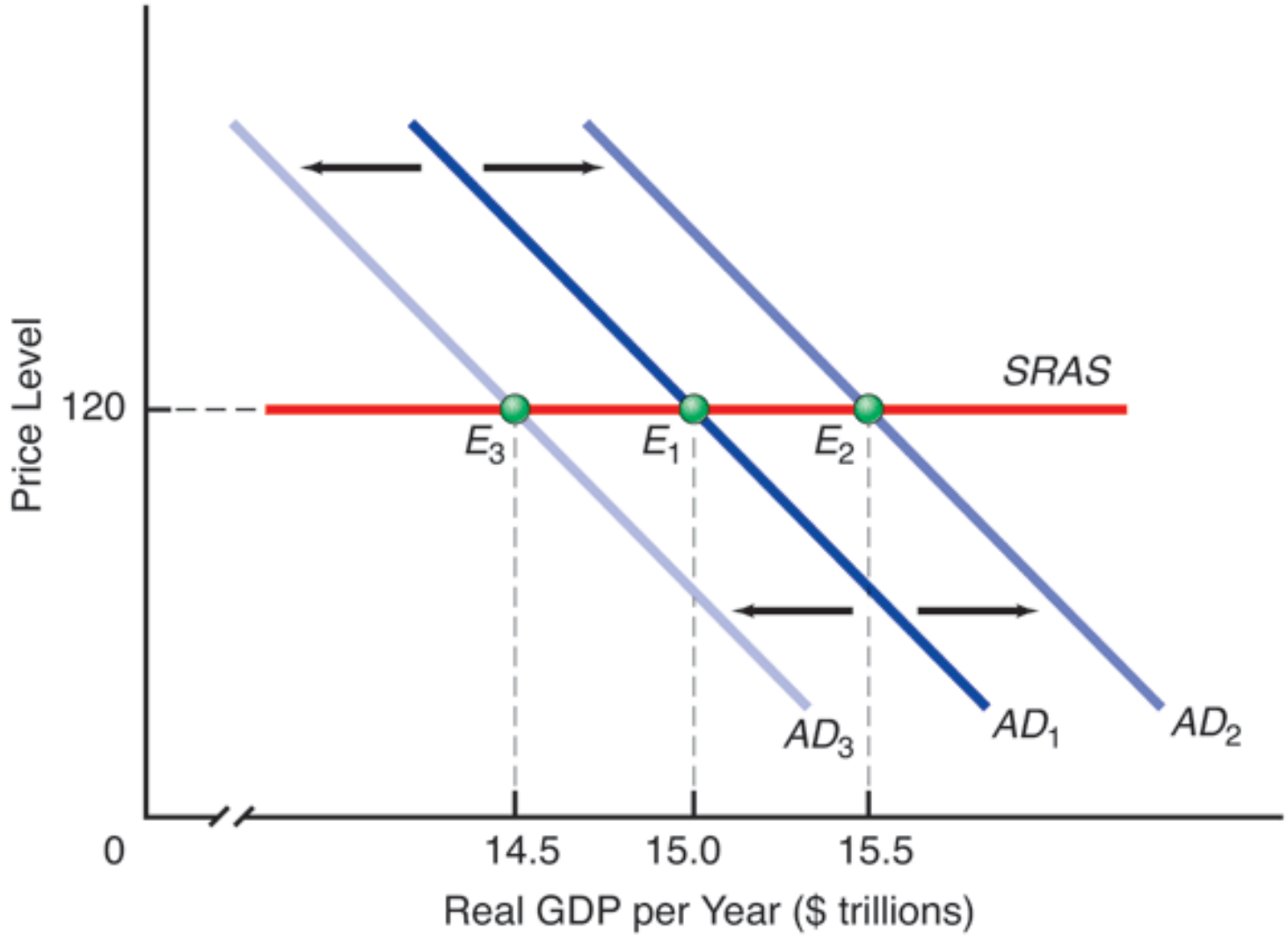
Keynesian Economics and the Keynesian Short-Run Aggregate Supply Curve (cont'd)

- Keynes and his followers argued
  - Prices, including wages (the price of labor) are inflexible, or "sticky", downward
  - An increase in aggregate demand, *AD*, will not raise the price level
  - A decrease in *AD* will not cause firms to lower the price level

Keynesian Economics and the Keynesian Short-Run Aggregate Supply Curve (cont'd)

- Keynesian Short-Run Aggregate Supply Curve
  - The horizontal portion of the aggregate supply curve in which there is excessive unemployment and unused capacity in the economy

Figure 11-6 Demand-Determined Equilibrium Real GDP at Less Than Full Employment



Keynesian Economics and the Keynesian Short-Run Aggregate Supply Curve (cont'd)

- Real GDP and the price level, 1934–1940
  - Keynes argued that in a depressed economy, increased aggregate spending can increase output without raising prices
  - Data showing the U.S. recovery from the Great Depression seem to bear this out
  - In such circumstances, real GDP is demand driven as the short-run aggregate supply curve was almost flat

Keynesian Economics and the Keynesian Short-Run Aggregate Supply Curve (cont'd)

- The Keynesian model
  - Equilibrium GDP is *demand-determined*
  - The Keynesian short-run aggregate supply schedule shows sources of price rigidities
    - Union and long-term contracts explain inflexibility of nominal wage rates

Example: Have Inflation-Adjusted U.S. Wages Been "Too High"?

- Unemployment occurs when there is a surplus in the labor market.
- Other things being equal, a labor surplus will begin to disappear only if the inflation-adjusted wage rate drops towards the market-clearing level.
  - Since 2008, inflation-adjusted wages in the U.S. have declined by about 0.2 percent per year.
  - Many economists suggest that real wages are not declining enough to eliminate the labor market surplus.
  - Consequently, a significant number of workers will remain unemployed.

Output Determination Using Aggregate Demand and Aggregate Supply: Fixed versus Changing Price Levels in the Short Run

- The underlying assumption of the simplified Keynesian model is that the relevant range of the short-run aggregate supply schedule *(SRAS)* is horizontal

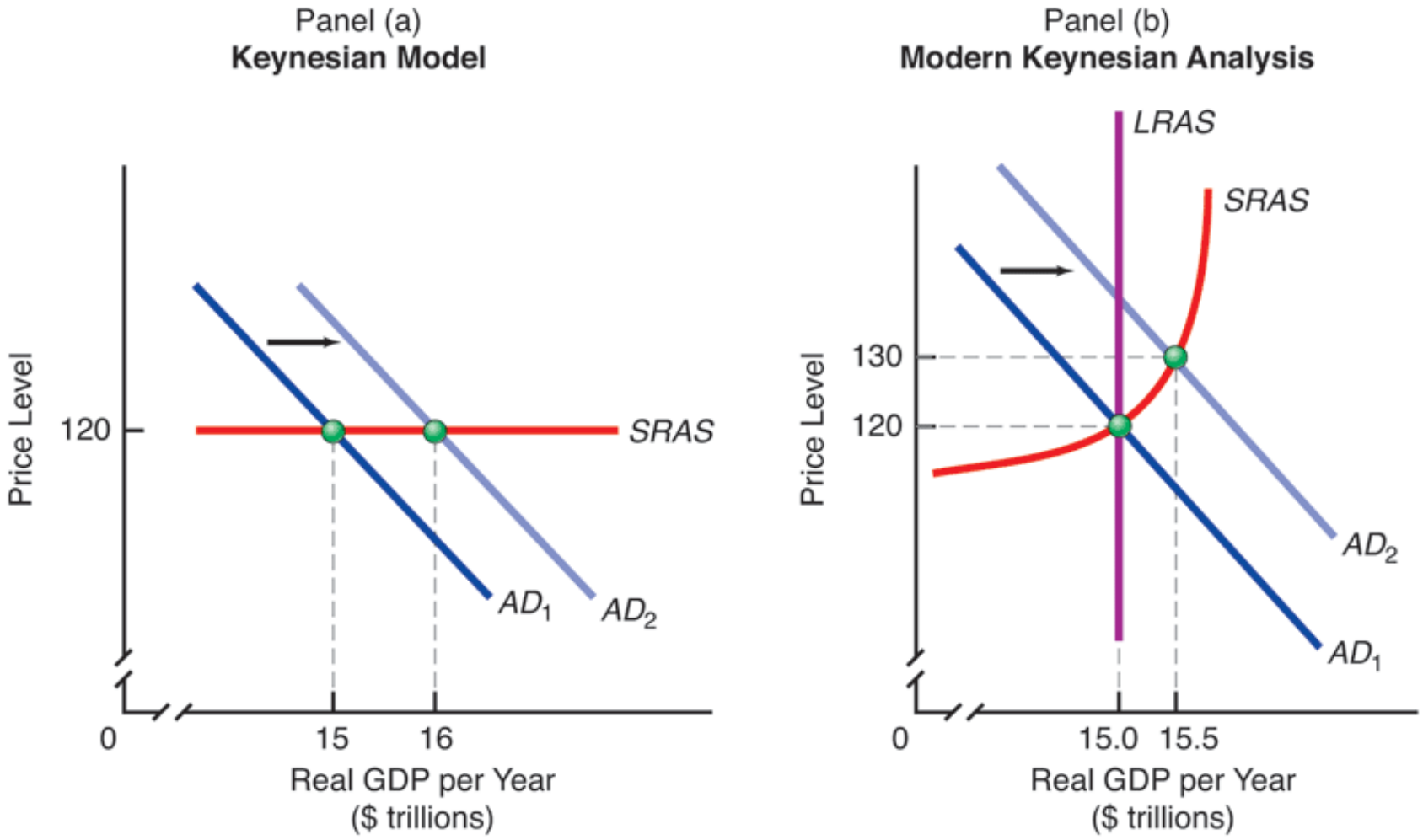
Output Determination Using Aggregate Demand and Aggregate Supply: Fixed versus Changing Price Levels in the Short Run (cont'd)

- The price level has drifted upward in recent decades
- Prices are not totally sticky
- Modern Keynesian analysis recognizes *some* —but not complete—price adjustment takes place in the short run

Output Determination Using Aggregate Demand and Aggregate Supply: Fixed versus Changing Price Levels in the Short Run (cont'd)

- Short-Run Aggregate Supply Curve
  - Relationship between total planned economywide production and the price level in the short run, all other things held constant
  - If prices adjust incompletely in the short run, the curve is positively sloped

Figure 11-7 Real GDP Determination with Fixed versus Flexible Prices



Output Determination Using Aggregate Demand and Aggregate Supply: Fixed versus Changing Price Levels in the Short Run (cont'd)

- In the modern Keynesian short run, when the price level rises partially, real GDP can expand beyond the level consistent with its long-run growth path.
- This is because:
  - Most labor contracts allow for flexibility in the total number of hours worked.
  - The existing capital stock can be used more intensely.
  - If wages are constant when prices rise, a firm is more profitable in its operations.

Output Determination Using Aggregate Demand and Aggregate Supply: Fixed versus Changing Price Levels in the Short Run (cont'd)

- All these adjustments cause real GDP to rise as the price level increases:
  - Firms use workers more intensively, (getting workers to work harder)
  - Existing capital equipment used more intensively, (use machines longer)
  - If wage rates held constant, a higher price level leads to increased profits, which leads to lower unemployment as firms hire more

Shifts in the Aggregate Supply Curve

- Just as non-price-level factors can cause a shift in the aggregate demand curve, there are non-price-level factors that can cause a shift in the aggregate supply curve

Shifts in the Aggregate Supply Curve (cont'd)

- Shifts in both the short- and long-run aggregate supply
  - Includes any change in our endowments of the factors of production
- Shifts in *SRAS* only
  - Includes changes in production input prices, particularly those caused by temporary external events

Figure 11-8 Shifts in Long-Run and Short-Run Aggregate Supply

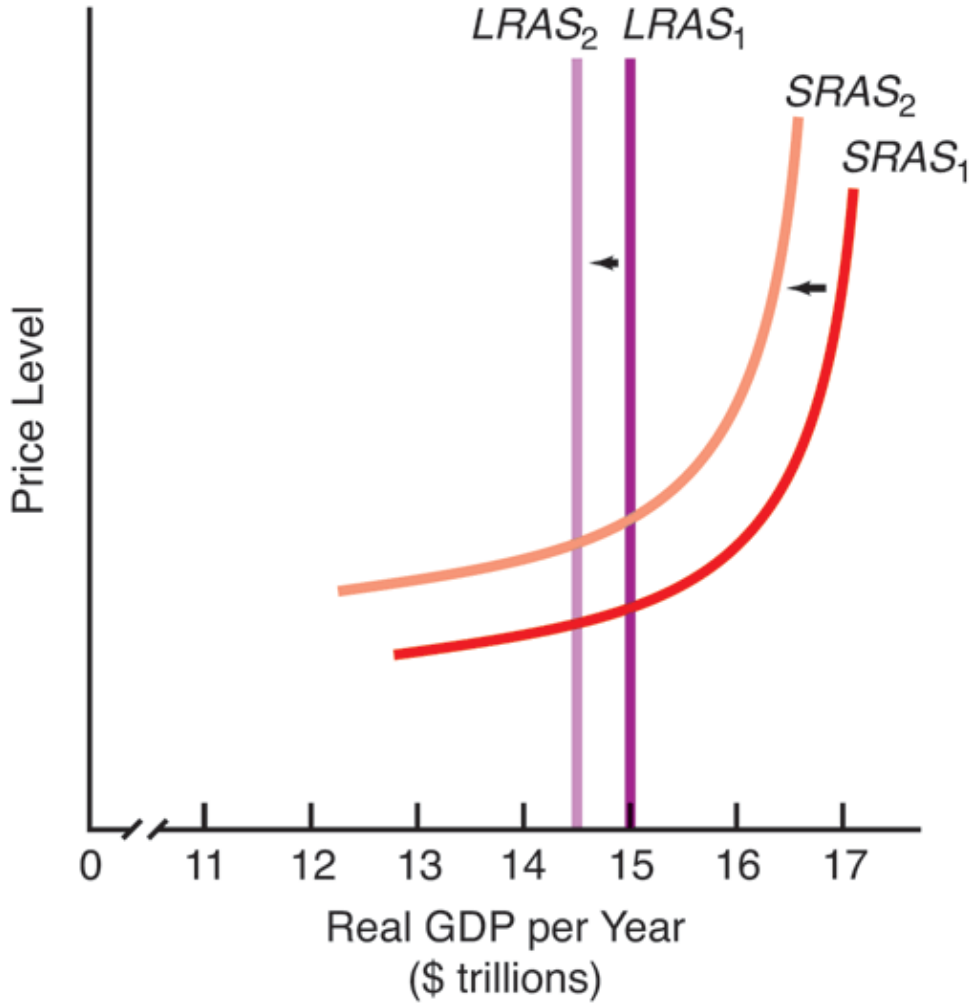


Table 11-2 Determinants of Aggregate Supply

Changes That Cause an Increase in Aggregate Supply	Changes That Cause a Decrease in Aggregate Supply
Discoveries of new raw materials	Depletion of raw materials
Increased competition	Decreased competition
A reduction in international trade barriers	An increase in international trade barriers
Fewer regulatory impediments to business	More regulatory impediments to business
An increase in the supply of labor	A decrease in labor supplied
Increased training and education	Decreased training and education
A decrease in marginal tax rates	An increase in marginal tax rates
A reduction in input prices	An increase in input prices

International Example: Australia's Short-Run Aggregate Supply Hit by a Locust Plague

- Recently, Australia has experienced its worst plague of locusts in half a century.
- The insects have ravaged large portions of the nations crops including rice, wheat, and barley, as well as other crops that are livestock feed.
- These products are important inputs for many food products.
- The result is higher input prices, causing a leftward shift of aggregate supply.

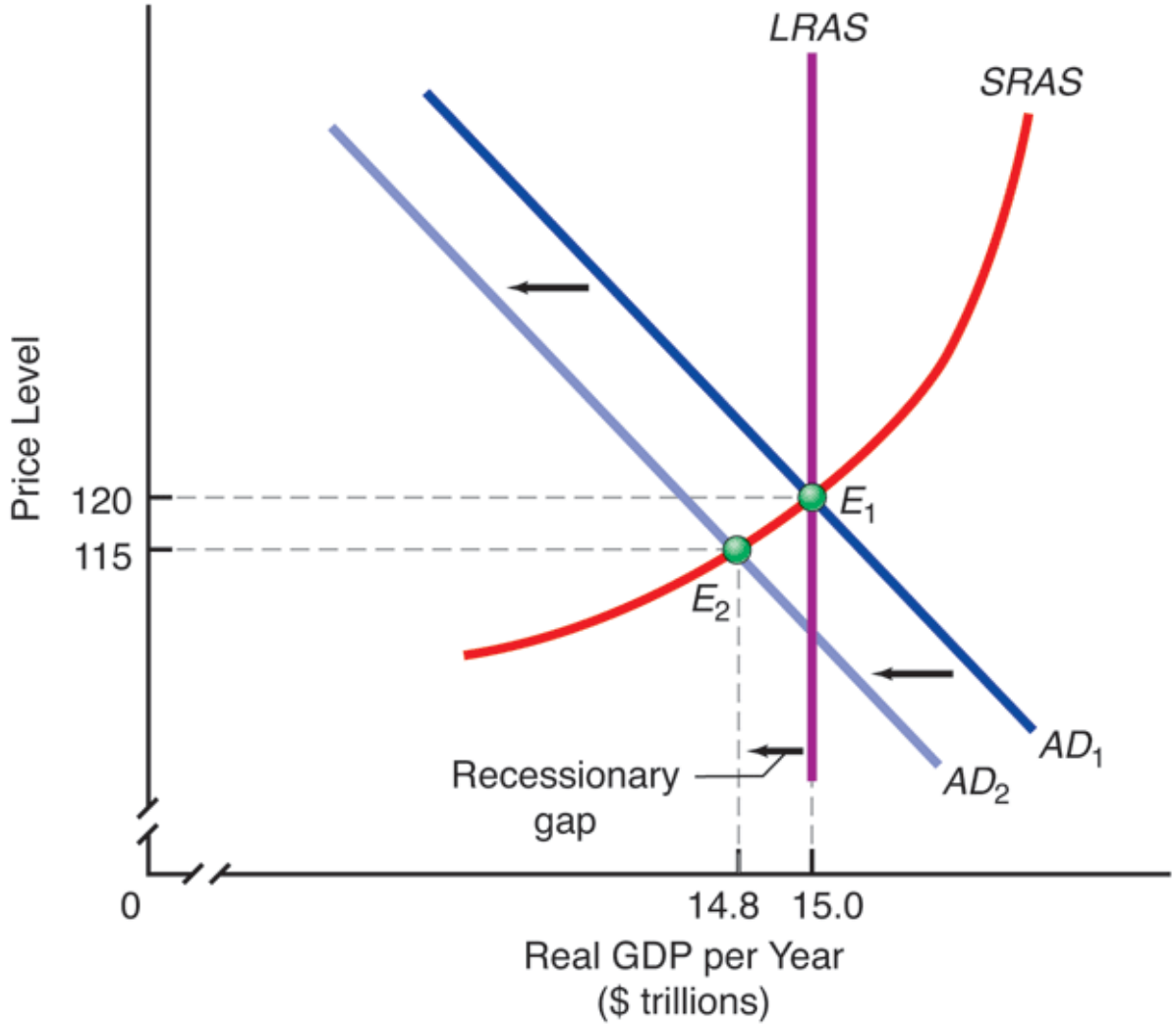
Consequences of Changes in Aggregate Demand

- Aggregate Demand Shock
  - Any event that causes the aggregate demand curve to shift inward or outward
- Aggregate Supply Shock
  - Any event that causes the aggregate supply curve to shift inward or outward

Consequences of Changes in Aggregate Demand (cont'd)

- Recessionary Gap
  - The gap that exists whenever equilibrium real GDP per year is less than full-employment real GDP as shown by the position of the *LRAS* curve

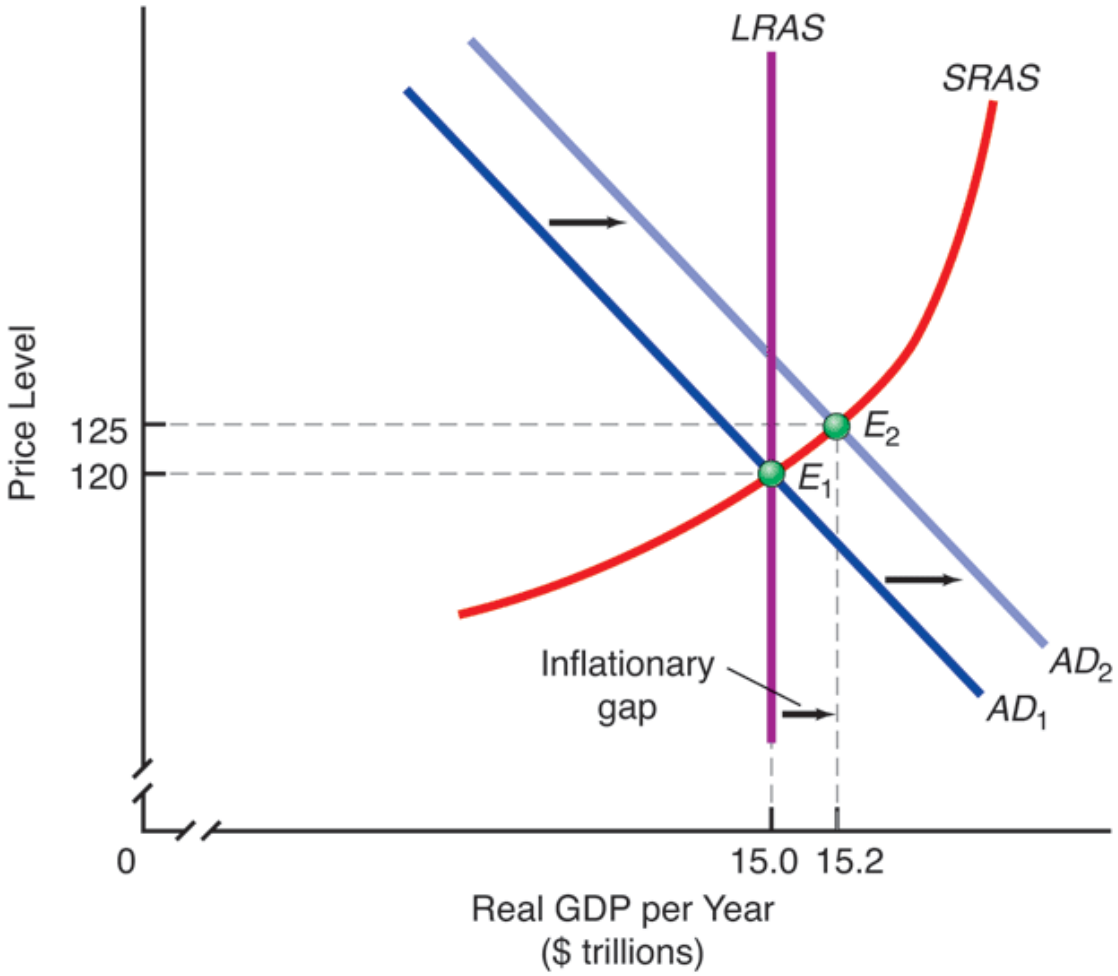
Figure 11-9 The Short-Run Effects of Stable Aggregate Supply and a Decrease in Aggregate Demand: The Recessionary Gap



Consequences of Changes in Aggregate Demand (cont'd)

- Inflationary Gap
  - The gap that exists whenever equilibrium real GDP per year is greater than full-employment real GDP as shown by the position of the *LRAS* curve

Figure 11-10 The Effects of Stable Aggregate Supply with an Increase in Aggregate Demand: The Inflationary Gap



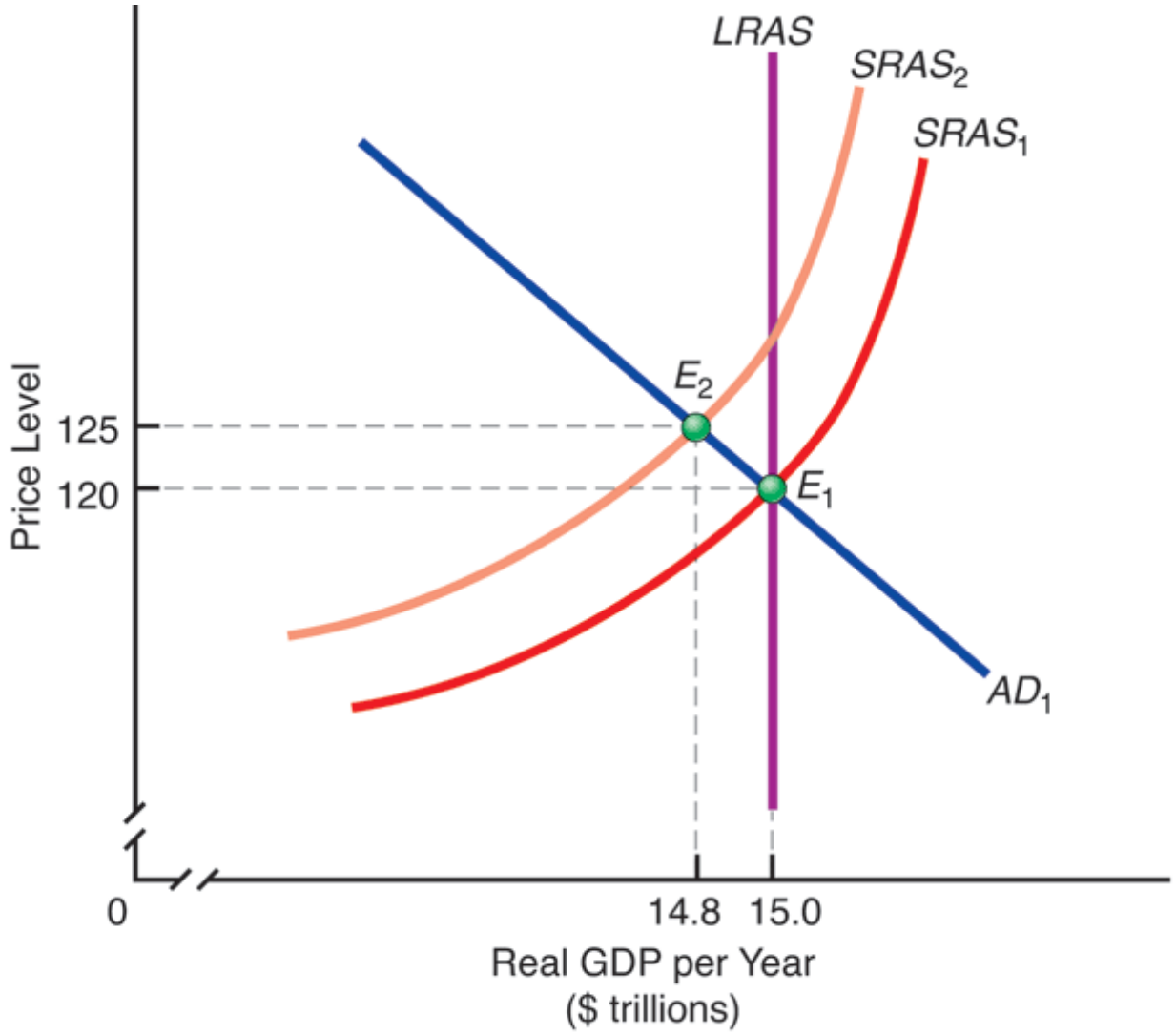
Explaining Short-Run Variations in Inflation

- In a growing economy, the explanation for persistent inflation is that aggregate demand rises over time at a faster pace than the full-employment level of real GDP
- Short-run variations in inflation, however, can arise as a result of both demand *and* supply factors

Explaining Short-Run Variations in Inflation (cont'd)

- Demand-Pull Inflation
  - Inflation caused by increases in aggregate demand not matched by increases in aggregate supply
- Cost-Push Inflation
  - Inflation caused by decreases in short-run aggregate supply

Figure 11-11 Cost-Push Inflation



Explaining Short-Run Variations in Inflation (cont'd)

- Aggregate Supply and Demand in the Open Economy
  - The open economy is one of the reasons why aggregate demand slopes downward
  - When the domestic price level rises, U.S. residents want to buy cheaper-priced foreign goods
  - The opposite occurs when the U.S. domestic price level falls

Explaining Short-Run Variations in Inflation (cont'd)

- If the dollar becomes weaker against other world currencies
  - A shift inward to the left in the short-run aggregate supply curve
  - Equilibrium real GDP would fall
  - Price level would rise
  - Employment would tend to decrease
  - Contributes to inflation

Figure 11-12 The Two Effects of a Weaker Dollar, Panel (a)

- Decrease in the value of the dollar raises the cost of imported inputs
- *SRAS* decreases
- With *AD* constant, the price level rises and GDP decreases

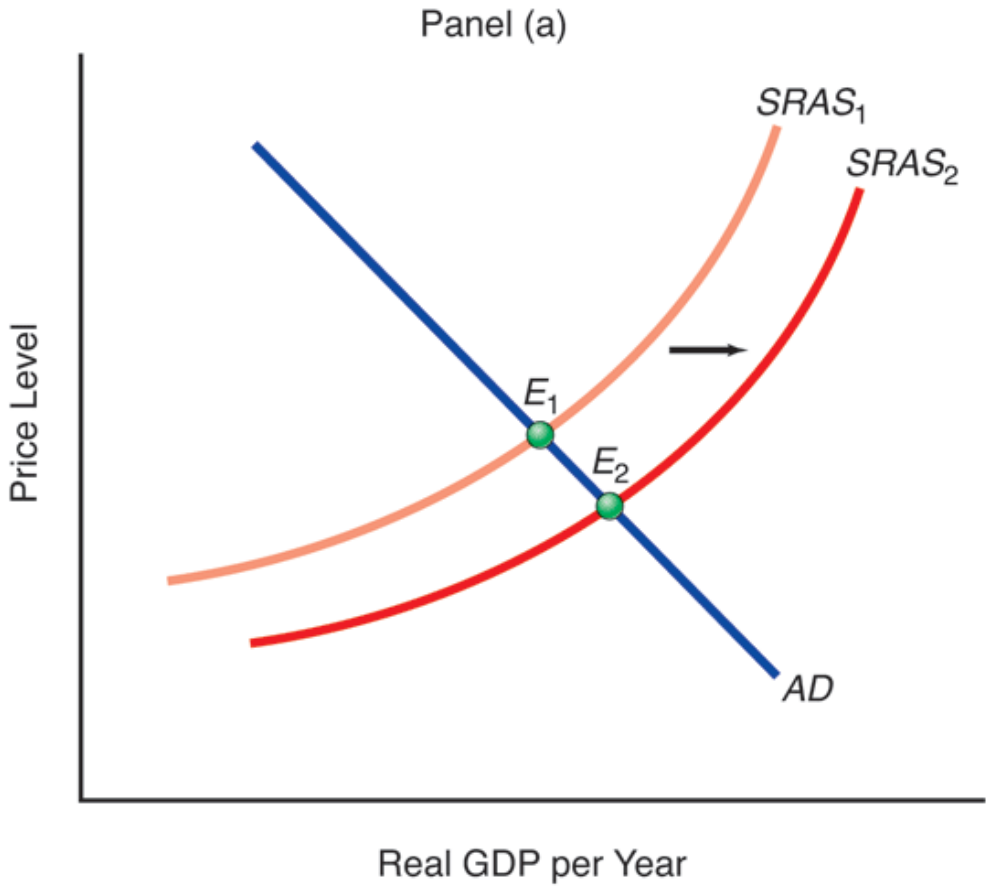
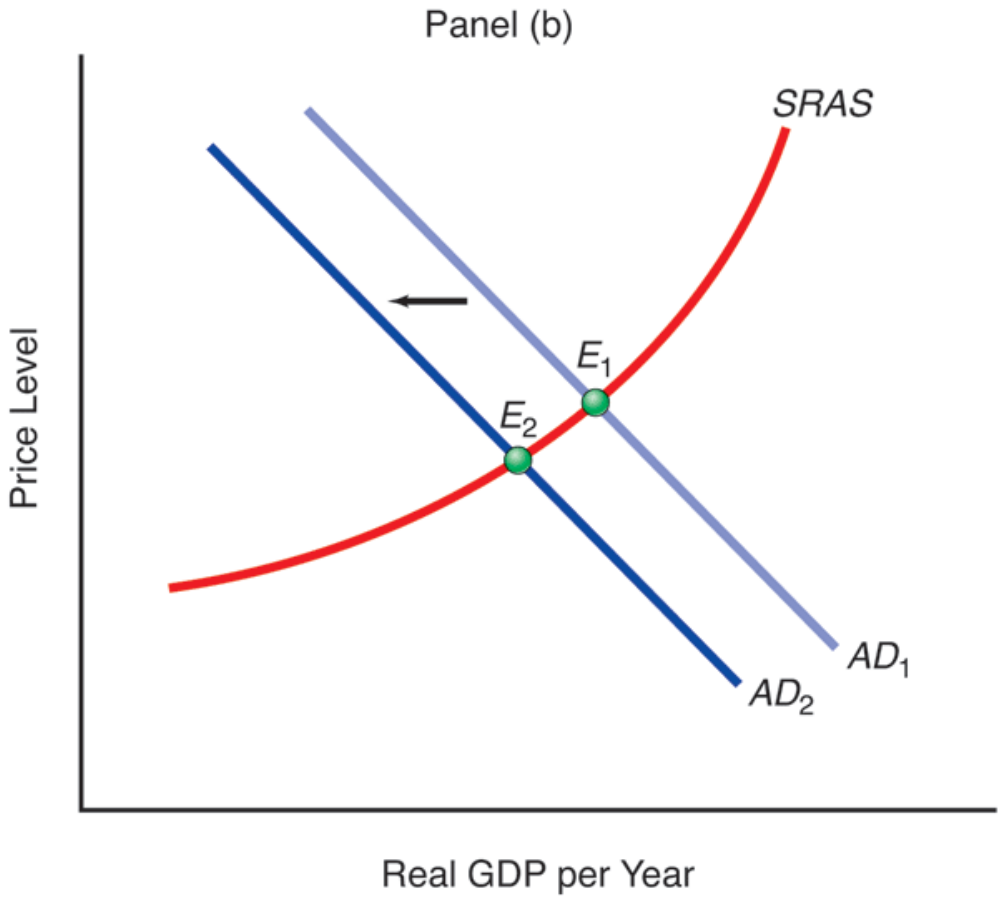


Figure 11-12 The Two Effects of a Weaker Dollar, Panel (b)

- Decrease in the value of the dollar makes net exports rise
- *AD* increases
- With *SRAS* constant, the price level rises with GDP



What If . . . a nation's government tries to head off a recession by pushing down the exchange value of the country's currency?

- On the one hand, reducing the exchange value of the currency would make the nation's export goods less expensive in foreign currencies, thereby boosting foreign spending on home exports.
- On the other hand, home-currency prices of inputs imported from abroad would increase.
- Overall, pushing down the exchange value of the home currency might not necessarily help to head off an economic downturn.

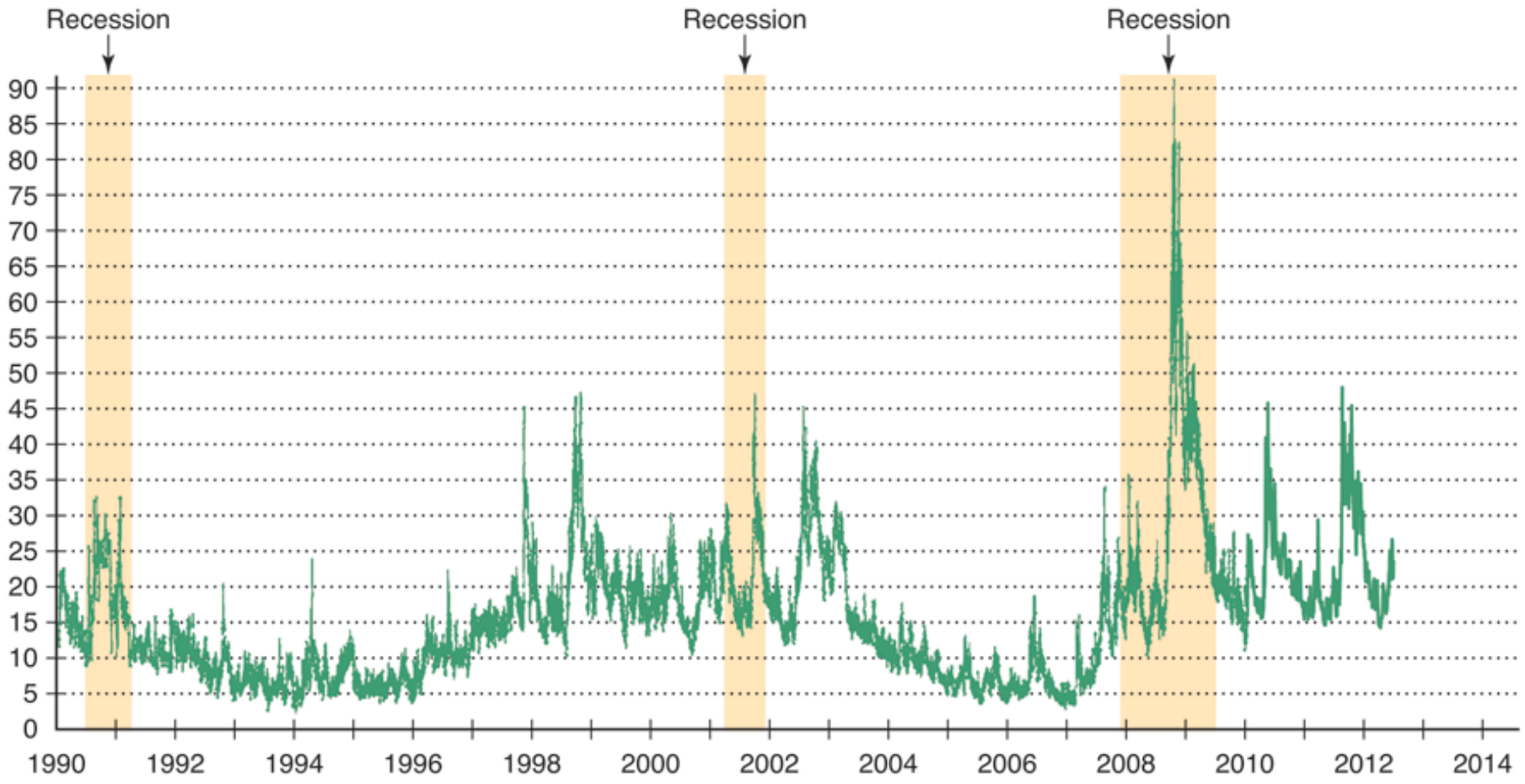
You Are There: Worried About Shocks to Aggregate Supply – and Demand

- Vincent Hartnett, Jr., president of Penske Logistics, is confused. He hears the Federal Reserve talk about fears of deflation. Yet, in his view, inflationary pressures are abundant:
  - His firms health care costs have jumped 9 percent in the past year
  - Fuel costs and wage levels are on the increase
- So, for Penske Logistics, a lower level of output is associated with every given price level.
- He sees this an indication that inflation will increase, and he expresses concern that the Federal Reserve may worsen the problem.

Issues & Applications: Gauging Financial Sources of Aggregate Demand Shocks

- During a two-week period in 2011, the average value of corporate shares traded on the U.S. stock market dropped by more than 15 percent. This erased about $2 trillion of household wealth.
- Households responded by reducing their planned expenditures, and the result was a negative aggregate demand shock.
- The next slide displays the VIX index, a measure of financial market volatility.

Figure 11-13 The VIX Index of Financial-Market Volatility since 1990



Source: U.S. Department of Commerce.

Issues & Applications: Gauging Financial Sources of Aggregate Demand Shocks (cont'd)

- Large changes in the VIX index can occur because of usual world events, or as a result of shocks in financial markets.
  - Worries about the financial stability of Greece in 2011 erased $2 trillion of stock market wealth.
- The most recent recession is clearly related to an increase in the VIX index.
  - Financial shocks were so great that a significant, prolonged reduction in aggregate demand occurred.

Summary Discussion of Learning Objectives

- Central assumptions of the classical model:
  1. Pure competition prevails
  2. Wages and prices are flexible
  3. People are motivated by self-interest
  4. No money illusion

Summary Discussion of Learning Objectives (cont'd)

- Short-run determination of equilibrium real GDP and the price level in the classical model
  - The short-run aggregate supply curve is vertical at full-employment real GDP
  - Even in the short run, real GDP cannot increase in the absence of changes in factors of production that induce longer-term economic growth
  - Movements in equilibrium price level are generated by variations in position of *AD* curve

Summary Discussion of Learning Objectives (cont'd)

- Circumstances under which the *SRAS* may be horizontal or upward sloping
  - If product prices and wages and other input prices are "sticky," the *SRAS* curve can be horizontal over much of its range
  - This is the Keynesian *SRAS* curve

Summary Discussion of Learning Objectives (cont'd)

- Factors that induce shifts in the *SRAS* and *LRAS* curves
  - *LRAS* shifts in response to changes in the availability of labor or capital or to changes in technology and productivity
  - Changes in these factors also cause the *SRAS* curve to shift

Summary Discussion of Learning Objectives (cont'd)

- Effects of aggregate demand and supply shocks on equilibrium real GDP in the short run
  - Shock that causes *AD* to shift leftward and pushes equilibrium real GDP below full-employment real GDP in the short run, so there is a recessionary gap

Summary Discussion of Learning Objectives (cont'd)

- Effects of aggregate demand and supply shocks on equilibrium real GDP in the short run
  - Shock that induces a rightward shift in the *AD* curve and results in an inflationary gap in which short-run equilibrium real GDP exceeds full-employment

Summary Discussion of Learning Objectives (cont'd)

- Causes of short-run variations in the inflation rate
  - An increase in aggregate demand
    - Demand-pull
  - A decrease in short-run aggregate supply
    - Cost-push