

Chapter 11: Keynesianism: The Macroeconomics of Wage and Price Rigidity

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- Summarize the Keynesian explanations for real-wage rigidity.
- Describe the causes and effects of price stickiness according to the Keynesian model.
- Analyze the effects of monetary and fiscal policy in the Keynesian model.
- Explain Keynesian theories about business cycles and macroeconomic stabilization.

Wage rigidity is important in explaining unemployment

- In the classical model, unemployment is due to mismatches between workers and firms.
- Keynesians are skeptical, believing that recessions lead to substantial cyclical employment.
- To get a model in which unemployment persists, Keynesian theory posits that the real wage is slow to adjust to equilibrate the labor market.

Some reasons for real-wage rigidity

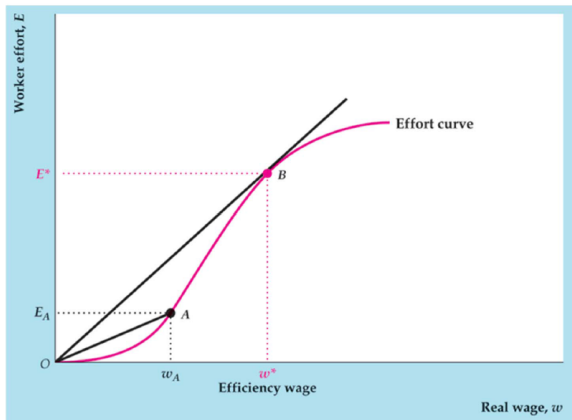
- For unemployment to exist, the real wage must exceed the market-clearing wage.
- If the real wage is too high, why don't firms reduce the wage?
 - One possibility is that the minimum wage and labor unions prevent wages from being reduced.
 - But most U.S. workers aren't minimum wage workers, nor are they in unions.
 - The minimum wage would explain why the nominal wage is rigid, but not why the real wage is rigid.
 - This might be a better explanation in Europe, where unions are far more powerful.
- Another possibility is that a firm may want to pay high wages to get a stable labor force and avoid turnover costs—costs of hiring and training new workers.

The Efficiency Wage Model

- A third reason is that workers' productivity may depend on the wages they're paid—the efficiency wage model.
- Workers who feel well treated will work harder and more efficiently (the "carrot"); this is Akerlof's gift exchange motive.
- Workers who are well paid won't risk losing their jobs by shirking (the "stick").
- Both the gift exchange motive and shirking model imply that a worker's effort depends on the real wage (Fig. 11.1).



Figure 11.1 Determination of the efficiency wage



- (Conti.) The effort curve, plotting effort against the real wage, is *S*-shaped:
 - At low levels of the real wage, workers make hardly any effort.
 - Effort rises as the real wage increases.
 - As the real wage becomes very high, effort flattens out as it reaches the maximum possible level.

Wage determination in the efficiency wage model

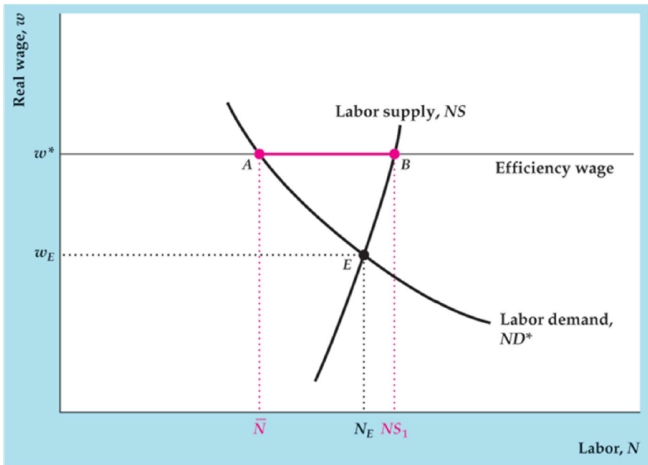
- Given the effort curve, what determines the real wage firms will pay?
- To maximize profit, firms choose the real wage that gets the most effort from workers for each dollar of real wages paid.
- This occurs at point B in Fig. 11.1, where a line from the origin is just tangent to the effort curve.
- The wage rate at point B is called the efficiency wage.
- The real wage is rigid, as long as the effort curve doesn't change.

Employment and Unemployment in the Efficiency Wage Model

- The labor market now determines employment and unemployment, depending on how far above the market-clearing wage is the efficiency wage (Fig. 11.2).
- The labor supply curve is upward sloping, while the labor demand curve is the *MPN* when the effort level is determined by the efficiency wage.
- The difference between labor supply and labor demand is the amount of unemployment.
- The fact that there's unemployment puts no downward pressure on the real wage, since firms know that if they reduce the real wage, effort will decline.



Figure 11.2 Excess supply of labor in the efficiency wage model



Does the efficiency wage theory match up with the data?

- It seems to have worked for Henry Ford in 1914.
- Plants that pay higher wages appear to experience less shirking.
- But the theory implies that the real wage is completely rigid, whereas the data suggests that the real wage moves over time and over the business cycle.
- It is possible to jazz up the model to allow for the efficiency wage to change over time:
 - Workers would be less likely to shirk and would work harder during a recession if the probability of losing their jobs increased.
 - This would cause the effort curve to rise and may cause the efficiency wage to decline somewhat.
 - This would lead to a lower real wage rate in recessions, which is consistent with the data.

Efficiency wages and the FE line

- The FE line is vertical, as in the classical model, since full-employment output is determined in the labor market and doesn't depend on the real interest rate.
- But in the Keynesian model, changes in labor supply don't affect the FE line, since they don't affect equilibrium employment.
- A change in productivity does affect the FE line, since it affects labor demand.

Price stickiness is the tendency of prices to adjust slowly to changes in the economy

- The data suggest that money is not neutral, so Keynesians reject the classical model (without misperceptions).
- Keynesians developed the idea of price stickiness to explain why money isn't neutral.
- An alternative version of the Keynesian model (discussed in Appendix 11.A) assumes that nominal wages are sticky, rather than prices; that model also suggests that money isn't neutral.

Sources of price stickiness: Monopolistic competition and menu costs

- Monopolistic competition
 - If markets had perfect competition, the market would force prices to adjust rapidly; sellers are price takers, because they must accept the market price.
 - In many markets, sellers have some degree of monopoly; they are price setters under monopolistic competition.
 - Keynesians suggest that many markets are characterized by monopolistic competition.
- In monopolistically competitive markets, sellers do three things:
 - They set prices in nominal terms and maintain those prices for some period.
 - They adjust output to meet the demand at their fixed nominal price.
 - They readjust prices from time to time when costs or demand change significantly.

Menu costs and price stickiness

- The term menu costs comes from the costs faced by a restaurant when it changes prices—it must print new menus.
- Even small costs like these may prevent sellers from changing prices often.
- Since competition isn't perfect, having the wrong price temporarily won't affect the seller's profits much.
- The firm will change prices when demand or costs of production change enough to warrant the price change.

Empirical evidence on price stickiness

- Industrial prices seem to be changed more often in competitive industries, less often in more monopolistic industries (Carlton study).
- Blinder and his coauthors found a high degree of price stickiness in their survey of firms.
 - The main reason for price stickiness was managers' fear that if they raised their prices, they'd lose customers to rivals.
- But catalog prices also don't seem to change much from one issue to the next and often change by only small amounts, suggesting that while prices are sticky, menu costs may not be the reason (Kashyap).

- (Conti.) Price stickiness may not be pervasive, as prices change on average every 4.3 months (Bils-Klenow).
- But some of the measured price stickiness is because of sales; when you look at price changes excluding sales, prices change on average every 11 months (Nakamura-Steinsson).
- Relative prices may respond quickly to supply or demand shocks for a particular good, but the price level may change slowly to changes in monetary policy (Boivin-Giannoni-Mihov), so in our macroeconomic model, the assumption of price stickiness is useful.

Monopolistic competition: Meeting the demand at the fixed nominal price

- Since firms have some monopoly power, they price goods at a markup over their marginal cost of production:

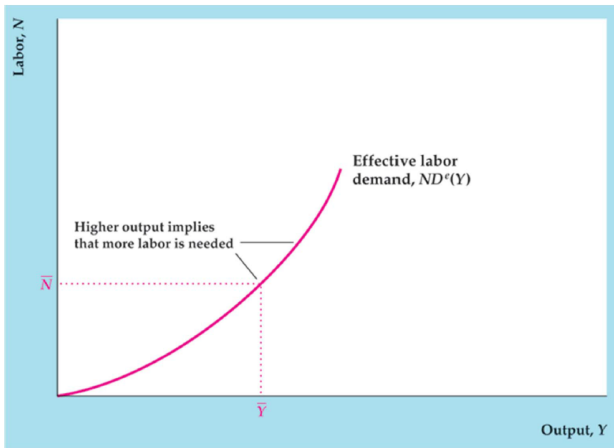
$$P = (1 + \eta)MC. \quad (1)$$

- If demand turns out to be larger at that price than the firm planned, the firm will still meet the demand at that price, since it earns additional profits due to the markup.
- Since the firm is paying an efficiency wage, it can hire more workers at that wage to produce more goods when necessary.
- This means that the economy can produce an amount of output that is not on the FE line during the period in which prices haven't adjusted.

- The firm's labor demand is thus determined by the demand for its output.
- The effective labor demand curve, $ND^e(Y)$, shows how much labor is needed to produce the output demanded in the economy (Fig. 11.3).
- It slopes upward from left to right because a firm needs more labor to produce additional output.



Figure 11.3 The effective labor demand curve



Monetary policy in the Keynesian IS-LM model

- The Keynesian FE line differs from the classical model in two respects:
 - The Keynesian level of full employment occurs where the efficiency wage line intersects the labor demand curve, not where labor supply equals labor demand, as in the classical model.
 - Changes in labor supply don't affect the *FE* line in the Keynesian model; they do in the classical model.
- Since prices are sticky in the short run in the Keynesian model, the price level doesn't adjust to restore general equilibrium:
 - Keynesians assume that when not in general equilibrium, the economy lies at the intersection of the *IS* and *LM* curves, and may be off the *FE* line.
 - This represents the assumption that firms meet the demand for their products by adjusting employment.

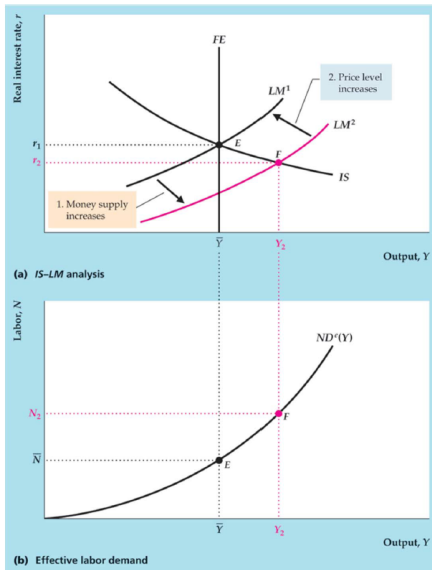
Analysis of an increase in the nominal money supply (Fig. 11.4)

- LM curve shifts down from $LM1$ to $LM2$.
- Output rises and the real interest rate falls.
- Firms raise employment and production due to increased demand.
- The increase in money supply is an expansionary monetary policy (easy money); a decrease in money supply is contractionary monetary policy (tight money).
- Easy money increases real money supply, causing the real interest rate to fall to clear the money market:
 - The lower real interest rate increases consumption and investment.
 - With higher demand for output, firms increase production and employment.
- Eventually firms raise prices, the LM curve shifts back to its original level, and general equilibrium is restored.
- Thus money is neutral in the long run, but not in the short run.



Figure 11.4

An increase in the money supply



Monetary Policy in the Keynesian AD-AS framework

- We can do the same analysis in the $AD - AS$ framework.
- The main difference between the Keynesian and classical approaches is the speed of price adjustment:
 - The classical model has fast price adjustment, so the $SRAS$ curve is irrelevant.
 - In the Keynesian model, the short-run AS ($SRAS$) curve is horizontal, because monopolistically competitive firms face menu costs.
- The effect of a 10% increase in money supply is to shift the AD curve up by 10% :
 - Thus output rises in the short run to where the $SRAS$ curve intersects the AD curve.
 - In the long run the price level rises, causing the $SRAS$ curve to shift up such that it intersects the AD and $LRAS$ curves.
- So in the Keynesian model, money is not neutral in the short run, but it is neutral in the long run.

- The effect of increased govt. purchases (Fig. 11.5).
 - A temporary increase in govt. purchases shifts the *IS* curve up.
 - In the short run, output and the real IR increase.
- The multiplier, $\Delta Y / \Delta G$, tells how much increase in output comes from the increase in govt. spending:
 - Keynesians think the multiplier is bigger than 1, so that not only does total output rise due to the increase in govt. purchases, but output going to the private sector increases as well.
 - Classical analysis also gets an increase in output, but only because higher current or future taxes caused an increase in labor supply, a shift of the *FE* line.
 - In the Keynesian model, the *FE* line doesn't shift, only the *IS* curve does.
- When prices adjust, the *LM* curve shifts up and equilibrium is restored at the full-employment level of output with a higher real IR than before.
- Similar analysis comes from looking at the *AD* – *AS* framework (Fig. 11.6).



Figure 11.5

An increase in government purchases

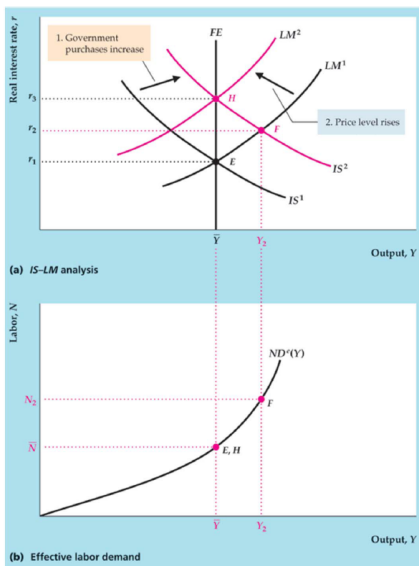
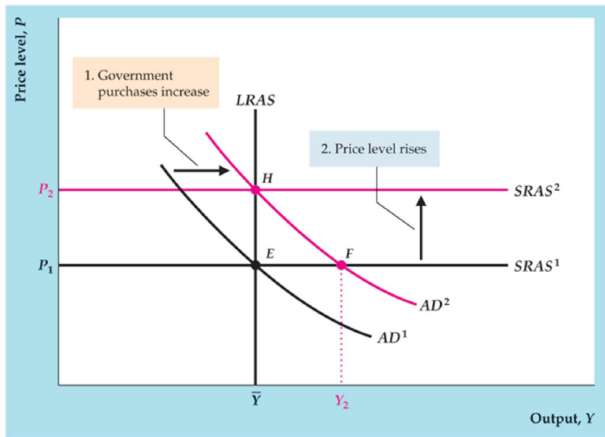




Figure 11.6 An increase in government purchases in the Keynesian *AD-AS* framework



The effect of lower taxes

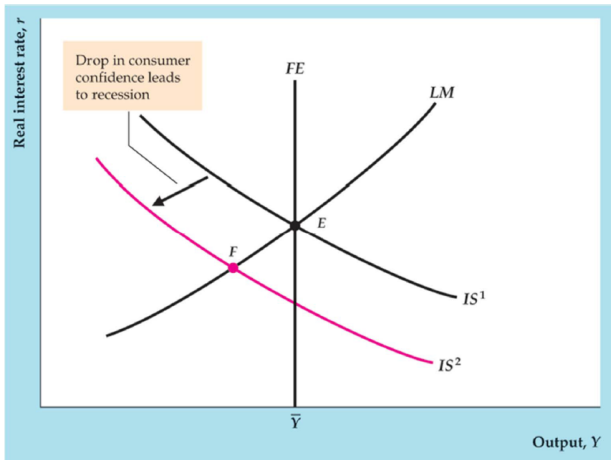
- Keynesians believe that a reduction of (lump-sum) taxes is expansionary, just like an increase in government purchases.
- Keynesians reject Ricardian equivalence, believing that the reduction in taxes increases consumption spending, reducing desired national saving and shifting the IS curve up.
- The only difference between lower taxes and increased govt. purchases is that when taxes are lower, consumption increases as a percentage of full-employment output, whereas when govt. purchases increase, govt. purchases become a larger percentage of full-employment output.

Keynesian business cycle theory

- Keynesians think aggregate demand shocks are the primary source of business cycle fluctuations.
- Aggregate demand shocks are shocks to the IS or LM curves, such as fiscal policy, changes in desired investment arising from changes in the expected future MPK , changes in consumer confidence that affect desired saving, and changes in money demand or supply (Fig. 11.7).
- A recession is caused by a shift of the AD curve to the left, either from the IS curve shifting down, or the LM curve shifting up.



Figure 11.7 A recession arising from an aggregate demand shock



The Keynesian theory fits certain business cycle facts

- There are recurrent fluctuations in output.
- Employment fluctuates in the same direction as output.
- Money is procyclical and leading.
- Investment and durable goods spending is procyclical and volatile:
 - This is explained by the Keynesian model if shocks to investment and durable goods spending are a main source of business cycles.
 - Keynes believed in "animal spirits," waves of pessimism and optimism, as a key source of business cycles.
- Inflation is procyclical and lagging
 - The Keynesian model fits the data on inflation, because the price level declines after a recession has begun, as the economy moves toward general equilibrium.

Procyclical labor productivity and labor hoarding

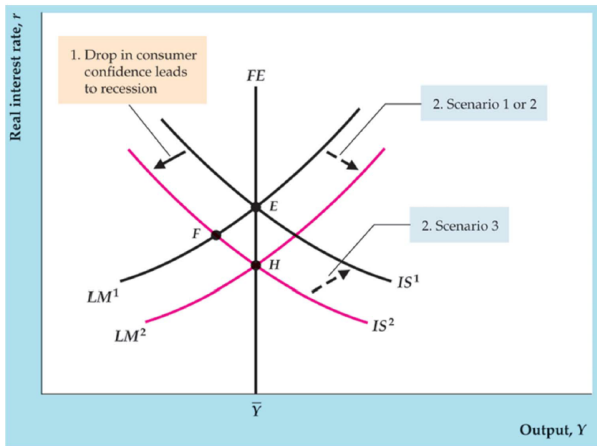
- As discussed in Sec. 11.1, firms may hoard labor in a recession rather than fire workers, because of the costs of hiring and training new workers.
- Such hoarded labor is used less intensively, being used on make-work or maintenance tasks that don't contribute to measured output.
- In a recession, measured productivity is low, even though the production function is stable.
- So labor hoarding explains why labor productivity is procyclical in the data without assuming that recessions and expansions are caused by productivity shocks.

Macroeconomic stabilization

- Keynesians favor government actions to stabilize the economy.
- Recessions are undesirable because the unemployed are hurt.
- Suppose there's a shock that shifts the IS curve down, causing a recession (Fig. 11.8).
- If the govt. does nothing, eventually the price level will decline, restoring general equilibrium. But output and employment may remain below their full-employment levels for some time:
 - The govt. could increase the money supply, shifting the LM curve down to move the economy to general equilibrium.
 - The govt. could increase gov. purchases to shift the IS curve back up to restore general equilibrium.



Figure 11.8 Stabilization policy in the Keynesian model



- (Conti.) Using monetary or fiscal policy to restore general equilibrium has the advantage of acting quickly, rather than waiting some time for the price level to decline.
- But the price level is higher in the long run when using policy than it would be if the government took no action.
- The choice of monetary or fiscal policy affects the composition of spending:
 - An increase in government purchases crowds out consumption and investment spending, because of a higher real IR.
 - Tax burdens are also higher when govt. purchases increase, further reducing consumption.

Difficulties of macroeconomic stabilization

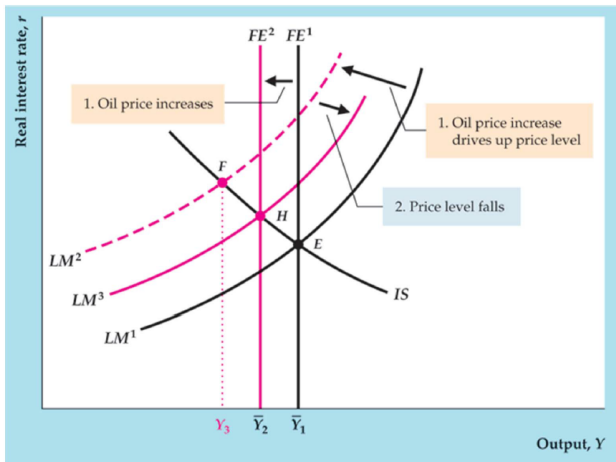
- Macroeconomic stabilization is the use of monetary and fiscal policies to moderate the business cycle; also called aggregate demand management.
- In practice, macroeconomic stabilization hasn't been terribly successful.
- One problem is in gauging how far the economy is from full employment, since we can't measure or analyze the state of the economy perfectly.
- Another problem is that we don't know the quantitative impact on output of a change in policy.
- Also, because policies take time to implement and take effect, using them requires good forecasts of where the economy will be six months or a year in the future; but our forecasting ability is quite imprecise.
- These problems suggest that policy shouldn't be used to "fine tune" the economy, but should be used to combat major recessions.

Supply shocks in the Keynesian model

- Until the mid-1970s, Keynesians focused on demand shocks as the main source of business cycles.
- But the oil price shock that hit the economy beginning in 1973 forced Keynesians to reformulate their theory.
- Now Keynesians concede that supply shocks can cause recessions, but they don't think supply shocks are the main source of recessions.
- An adverse oil price shock shifts the FE line left (Fig. 11.9):
 - The average price level rises, shifting the LM curve up (from $LM1$ to $LM2$), because the large increase in the price of oil outweighs the menu costs that would otherwise hold prices fixed.
 - The LM curve could shift farther than the FE line, as in the figure, though that isn't necessary.
 - So in the short run, inflation rises and output falls.



Figure 11.9 An oil price shock in the Keynesian model



- (Conti.) There's not much that stabilization policy can do about the decline in output that occurs, because of the lower level of full-employment output.
- Inflation is already increased due to the shock; expansionary policy to increase output would increase inflation further.

In touch with data and research: DSGE Models and the Classical-Keynesian Debate

- Until recently, classicals and Keynesians used very different models.
- Recently, each group has incorporated ideas from the other group; Keynesian economists began using DSGE models and classicals began using sticky prices and imperfect competition.
- Economists were able to reconcile aggregative models with models of microeconomic foundations.
- Classicals and Keynesians still disagree about the speed of wage and price adjustment and the role of government policy, but now speak the same language in modeling the economy.

- Some Keynesians think the nonneutrality of money is because of nominal-wage rigidity, not nominal-price rigidity:
 - Nominal wages could be rigid because of long-term contracts between firms and unions.
 - With nominal-wage rigidity, the short-run AS curve slopes upward instead of being horizontal.
 - Even so, the main results of the Keynesian model still hold.

The short-run aggregate supply curve with labor contracts

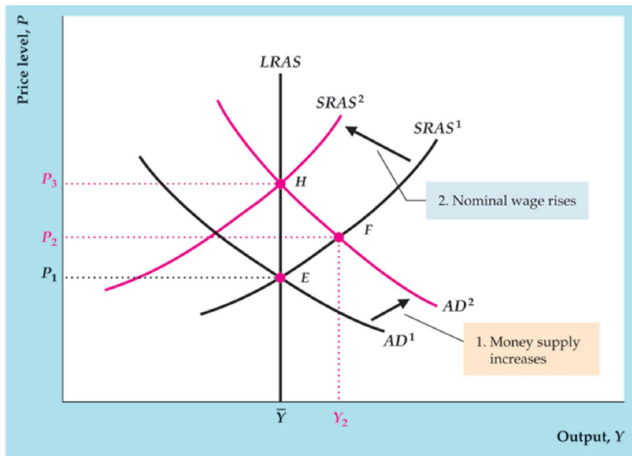
- U.S. labor contracts usually specify employment conditions and the nominal wage rate for three years.
- Employers decide on workers' hours and must pay them the contracted nominal wage.
- The result is an upward-sloping short-run AS curve:
 - As the price level rises, the real wage declines, since the nominal wage is fixed.
 - As the real wage declines, firms hire more workers and thus increase output.

Nonneutrality of money

- Money isn't neutral in this model, because as the money supply increases, the AD curve shifts along the fixed (upward-sloping) $SRAS$ curve (Fig. 11.A.1).
- As a result, output and the price level increase.
- Over time, workers will negotiate higher nominal wages and the $SRAS$ curve will shift left to restore general equilibrium.
- Thus money is nonneutral in the short run but neutral in the long run.



Figure 11.A.1 Monetary nonneutrality with long-term contracts



There are several objections to the theory nonneutrality of money

- Less than one-sixth of the U.S. labor force is unionized and covered by long-term wage contracts; however, some nonunion workers get wages similar to those in union contracts, and other workers may have implicit contracts that act like long-term contracts.
- Some labor contracts are indexed to inflation, so the real wage is fixed, not the nominal wage; however, most contracts aren't completely indexed.
- The theory predicts that real wages will be countercyclical, but in fact they are procyclical; however, if there are both AS shocks and AD shocks, real wages may turn out on average to be procyclical, but could still be countercyclical for demand shocks.