Chapter 11 Keynesianism: Wage and Price Rigidity

Introduction

We earlier described the Keynesian interpretation of the IS-LM AS-AD Model. The Keynesian model assumes that there exists a horizontal short-run aggregate supply curve to capture the existence of rigid prices.

This chapter examines some underlying reasons for price and wage rigidity and further investigates implications for our theory.

We begin by discussing (real) wage rigidity, and then (nominal) price rigidity.

Real Wage Rigidity: A Question

Our existing model assumes that the real wage adjusts to clear the labor market (so that quantities demanded and supplied are equal).

In the Keynesian model, we have argued that a demand increase causes firms to increase output, but this requires that more labor be employed. In the classical model, this implies that the labor market not be in its market-clearing equilibrium.

Why wouldn’t the labor market adjust to equilibrium?

The Efficiency Wage Model

Ultimately, the “efficiency wage model” can explain why real wages might be rigid, why unemployment can be persistent, and why labor is willing to supply added hours in response to a demand increase from firms.

The main idea underlying the efficiency wage model is that if firms pay higher real wages (than a market clearing level), workers may be more productive, because of added effort.

The gift exchange motive

The shirking control motive

Effort and Optimal Wage Setting

Suppose that “effort” is a function of the real wage paid.

Further, suppose that effort measures the increase in labor forthcoming from a worker. That is, if effort doubles, the output gained from an extra hour of labor doubles.
Given this, a firm will wish to set the real wage so that it gets the maximum effort per dollar spent on labor.

See the diagram next slide:

**Equilibrium Real Wage**

Note that firms set the real wage to maximize effort (output) per dollar spent on labor.

This determines the real wage. That wage need not be a real wage that leads to a demand-supply market-clearing equilibrium in the labor market.

This real-wage does not lead to zero unemployment.

Indeed, the existence of unemployment reinforces the efficiency wage model. Workers work hard to keep jobs that they value; unemployment is penalty attached to shirking.

See diagram illustrating “equilibrium.” This also determines FE line.
Real Wage Rigidity

The real wage will change only if the effort function changes.

The effort function may not change much with changing labor market conditions (unemployment), so the real wage will be rigid.

Even if the effort function were to change a small amount, firms will not suffer much by making small errors in setting the wage:

If a firm sets a wage to high, it loses by paying too much, but it gets an (almost) offsetting gain: effort increases!

Workers are Willing to Work More

If firms wish to expand employment and output at a given real wage, labor is willing.

There are unemployed workers ready to take the prevailing wage and work, given the existing unemployment.

Price Stickiness

We now know that if firms expand output in response to demand, they can find added labors without forcing up the real wage.

But why don’t they raise prices instead, so that we go to the new long-run equilibrium defined by the FE line (properly modified to reflect equilibrium in the efficiency wage model)?

We now explain why prices might be rigid.
**Monopolistic Competition**

Most firms are NOT perfect competitors.

They are not price-takers, but price-setters.

This is what is meant by market power, or monopoly power.

Monopolistically competitive firms sell differentiated products, so that small price changes do not lead to the extremes of infinite or zero demand for the firms’ outputs.

**Menu Costs**

Suppose that there are costs associated with making price changes.

For example, a restaurant that must reprint menus may find that costly.

If changing prices is costly, firms will do it less often.

But if menu costs are low, this does not provide much of an explanation for price rigidity.

Or does it?

**Menu Costs and Price Rigidity**

It turns out that when firms have price-setting power (monopoly power), that profits are not very sensitive to small errors in setting price optimally.

Therefore, when conditions change (like demand shifts), it is not very costly to leave prices unchanged.

Think of profit as a function of price. The maximum of the profit function determines the optimal price for the firm. But the profit function is flat in the vicinity of the maximum. This means small deviations from the best price produce only small changes in profit.

**Meeting Demand at a Fixed Price**

Firms who are price-setters have an optimal price that exceeds marginal cost.

The profit-maximization condition is that marginal revenue (which is less than price) should be equal to marginal cost.
This implies that a firm who has a set price is confronted with an increase in demand, it is

glad to sell the extra unit. So long as price exceeds marginal cost, then selling one more

unit adds to profit.

So firms who have set prices will be willing to sell extra units id demand materializes.

**Keynesianism Reviewed**

We can now summarize the logic behind the Keynesian position regarding the

consequences of an increase in aggregate demand.

When demand increases, firms meet the added demand at the current price. Given menu
costs, the failure to adjust price immediately is appropriate. Further, firms profit from
selling more output, since price exceeds marginal cost.

To expand output firms must hire labor. However, workers are available and hiring more
workers does not drive up the real wage (and costs of production).

**Monetary and Fiscal Policies in the Keynesian Model**

We will now consider the impacts of monetary and fiscal policy actions in the Keynesian
model.

Keep in mind ways the mechanics of the model differs from the Classical model:

- We know SRAS is assumed to be horizontal.
- The FE line is now determined by the efficiency wage and labor demand curves (not labor demand and supply).
- Labor supply is no longer shifts the FE line.

**A Monetary Expansion in the Keynesian Model: Short Run**

Taking price as fixed in the short run, we can focus on IS and LM (which will determine
output and the interest rate in the short-run).

An increase in the money supply (expansionary policy) shifts the LM curve to the right,
increasing output and lowering the real rate of interest.

Output now determines the required labor input (working “backwards” via the production
function). Employment rises; unemployment falls.

Consumption and investment rise (because of the reduction of the interest rate and the
rise in income).
A Monetary Expansion in the Keynesian Model: Long Run

The price level is not stuck forever; firms eventually react.

As prices rise LM shifts up (to the left), continuing to rise until IS, LM, and FE all intersect.

Money neutrality prevails in the long run, but not in the short run.

See diagram (next slide).

![IS-LM Analysis](image)

An Increase in Government Spending: Short Run

An increase in $G$ shifts the IS curve to the right.

Output and the real rate of interest rise, as the IS-LM diagram reveals.

The increase in output can exceed the initial increase in government spending because of multiplier effects (the initial increase in spending increases income, which induces added consumption and production, which increases income further, etc.)

Employment also rises; unemployment falls.

An Increase in Government Spending: Long Run

Again, prices do not remain stuck. The increase in demand puts upward pressure on price. LM rises as $P$ increases; this continues until IS, LM and FE intersect.

Note that the real rate of interest remains higher in the long run.
This implies that although output has returned to the full-employment level, the composition of output has changed with higher interest rates reducing investment and consumption as $G$ increases.

Recall that an increase in $G$ could also increase work effort, so actually the FE curve could have shifted to the right. This effect is not usually emphasized by Keynesians.

![Graph showing IS-LM analysis](image)

**A Tax Cut in the Keynesian Model**

If Ricardian equivalence does not hold (and Keynesians tend to be skeptical of it) a tax cut could increase current consumption and shift IS to the right. The effects are much as in the case of the government spending increase, except that now consumption rises and as investment declines.

There would also be no wealth effect on labor supply.

**Keynesian Theory and Business Cycles**

Keynesians emphasize demand shocks (shocks originally affecting IS and LM) as opposed to supply shocks (shocks to the production function or labor supply).

Sources of shocks:

1. Government spending
2. Taxes
3. Money supply changes
4. Changes in expected future $MPN$
5. Changes in consumer expectations affecting desired spending
**Keynesian Theory and Business Cycle Facts**

The Keynesian model predicts:

1. Occasional fluctuations as shocks occur.
2. Employment and output move together.
3. Money is procyclical and leading.
4. Investment is procyclical and volatile (if future expectations about MPK are volatile, or if money shocks cause investment fluctuations via interest rate changes).
5. When output varies with labor input, one would expect labor productivity to be countercyclical, but labor-hoarding can explain the observed procyclical relationship.

**Stabilization Policy**

Cycles represent deviations from equilibria, and stabilizing cycles would be desirable.

Recessions are especially harmful, since employment is far below the amount of labor workers would like to supply.

If a recession occurs, say because of a reduction in confidence, the government could:

1. do nothing
2. engage in expansionary monetary policy
3. engage in expansionary fiscal policy

**Stabilization Policy (continued)**

If the government does nothing, the economy will eventually return to the FE line, but it will do so slowly.

Fiscal and monetary policies offer the promise of a more rapid return to the FE line: expansionary policies can potentially offset negative shocks.

Increased government spending has a side-effect of “crowding out” private spending (consumption and investment), at least if the higher spending level is maintained.

**Difficulties with Stabilization Policies**

Knowing that the economy is not a full employment is not always a simple matter, since the full employment level of output is itself subject to change.
The responsiveness of the economy to stimulus is difficult to predict.

Policies may operate with lags; if one only reacts to current conditions it may already be too late.

**The Keynesian Model and Supply Shocks**

Although Keynesians emphasize demand shocks, supply shocks are also possible. Consider an oil price shock.

An oil price shock shifts the production function, but also directly raises the price level.

The price of oil rises. Despite general price rigidity, some products that are energy-intensive will see prices rise.

The FE curve shifts left and the LM curve shifts left. If the IS-LM intersection is left of the new FE, policy might be able to offset a part of the reduction, the shock will have negative consequences for output and the price level in any case.