

Questions for Review

1. The inside lag is the time it takes for policymakers to recognize that a shock has hit the economy and to put the appropriate policies into effect. Once a policy is in place, the outside lag is the amount of time it takes for the policy action to influence the economy. This lag arises because it takes time for spending, income, and employment to respond to the change in policy.

Fiscal policy has a long inside lag—for example, it can take years from the time a tax change is proposed until it becomes law. Monetary policy has a relatively short inside lag. Once the Fed decides a policy change is needed, it can make the change in days or weeks.

Monetary policy, however, has a long outside lag. An increase in the money supply affects the economy by lowering interest rates, which, in turn, increases investment. But many firms make investment plans far in advance. Thus, from the time the Fed acts, it takes about six months before the effects show up in real GDP.

2. Both monetary and fiscal policy work with long lags. As a result, in deciding whether policy should expand or contract aggregate demand, we must predict what the state of the economy will be six months to a year in the future.

One way economists try to forecast developments in the economy is with the index of leading indicators. It comprises 11 data series that often fluctuate in advance of the economy, such as stock prices, the number of building permits issued, the value of orders for new plants and equipment, and the money supply.

A second way forecasters look ahead is with models of the economy. These large-scale computer models have many equations, each representing a part of the economy. Once we make assumptions about the path of the exogenous variables—taxes, government spending, the money supply, the price of oil, and so forth—the models yield predictions about the paths of unemployment, inflation, output, and other endogenous variables.

3. The way people respond to economic policies depends on their expectations about the future. These expectations depend on many things, including the economic policies that the government pursues. The Lucas critique of economic policy argues that traditional methods of policy evaluation do not adequately take account of the way policy affects expectations.

For example, the sacrifice ratio—the number of percentage points of GDP that must be forgone to reduce inflation by 1 percentage point—depends on individuals' expectations of inflation. We cannot simply assume that these expectations will remain constant, or will adjust only slowly, no matter what policies the government pursues; instead, these expectations will depend on what the Fed does.

4. A person's view of macroeconomic history affects his or her view of whether macroeconomic policy should play an active role or a passive role. If one believes that the economy has experienced many large shocks to aggregate supply and aggregate demand, and if policy has successfully insulated the economy from these shocks, then the case for active policy is clear. Conversely, if one believes that the economy has experienced few large shocks, and if the fluctuations we observe can be traced to inept economic policy, then the case for passive policy is clear.

5. The problem of time inconsistency arises because expectations of future policies affect how people act today. As a result, policymakers may want to announce today the policy they intend to follow in the future, in order to influence the expectations held by private decisionmakers. Once these private decisionmakers have acted on their expectations, the policymakers may be tempted to renege on their announcement.

For example, your professor has an incentive to announce that there will be a final exam in your course, so that you study and learn the material. On the morning of the exam, when you have already studied and learned all the material, the professor might be tempted to cancel the exam so that he or she does not have to grade it.

Similarly, the government has an incentive to announce that it will not negotiate with terrorists. If terrorists believe that they have nothing to gain by kidnapping hostages, then they will not do so. However, once hostages are kidnapped, the government faces a strong temptation to negotiate and make concessions.

In monetary policy, suppose the Fed announces a policy of low inflation, and everyone believes the announcement. The Fed then has an incentive to raise inflation, because it faces a favorable tradeoff between inflation and unemployment.

The problem with situations in which time inconsistency arises is that people are led to distrust policy announcements. Then students do not study for their exams, terrorists kidnap hostages, and the Fed faces an unfavorable tradeoff. In these situations, a rule that commits the policymaker to a particular policy can sometimes help the policymaker achieve his or her goals—students study, terrorists do not take hostages, and inflation remains low.

6. One policy rule that the Fed might follow is to allow the money supply to grow at a constant rate. Monetarist economists believe that most large fluctuations in the economy result from fluctuations in the money supply; hence, a rule of steady money growth would prevent these large fluctuations.

A second policy rule is a nominal GDP target. Under this rule, the Fed would announce a planned path for nominal GDP. If nominal GDP were below this target, for example, the Fed would increase money growth to stimulate aggregate demand. An advantage of this policy rule is that it would allow monetary policy to adjust to changes in the velocity of money.

A third policy rule is an inflation target. The Fed would announce a target for the inflation rate and adjust the money supply when actual inflation deviated from its target. This rule helps insulate the economy from changes in velocity and is easy to explain to the public.

Problems and Applications

1. Suppose the economy has a Phillips curve

$$u = u^n - \alpha(\pi - E\pi).$$

As usual, this implies that if inflation is lower than expected, then unemployment rises above its natural rate, and there is a recession. Similarly, if inflation is higher than expected, then unemployment falls below its natural rate, and there is a boom. Also, suppose that the Democratic party always follows a policy of high money growth and high inflation (call it π^D), whereas the Republican party always follows a policy of low money growth and low inflation (call it π^R).

- a. The pattern of the political business cycle we observe depends on the inflation rate people expect at the beginning of each term. If expectations are perfectly rational and contracts can be adjusted immediately when a new party comes into power, then there will be no political business cycle pattern to unemployment. For example, if the Democrats win the coin flip, people immediately expect high inflation. Because $\pi = \pi^D = E\pi$, the Democrats' monetary policy will have no effect on the

real economy. We do observe a political business cycle pattern to inflation, in which Democrats have high inflation and Republicans have low inflation.

Now suppose that contracts are long enough that nominal wages and prices cannot be adjusted immediately. Before the result of the coin flip is known, there is a 50-percent chance that inflation will be high and a 50-percent chance that inflation will be low. Thus, at the beginning of each term, if people's expectations are rational, they expect an inflation rate of

$$E\pi = 0.5\pi^D + 0.5\pi^R.$$

If Democrats win the coin toss, then $\pi > \pi^e$ initially, and unemployment falls below its natural rate. Hence, there is a boom at the beginning of Democratic terms. Over time, inflation rises to π^D , and unemployment returns to its natural rate.

If Republicans win, then inflation is lower than expected, and unemployment rises above its natural rate. Hence, there is a recession at the beginning of Republican terms. Over time, inflation falls to π^R , and unemployment returns to its natural rate.

- b. If the two parties take turns, then there will be no political business cycle to unemployment, since everyone knows which party will be in office, so everyone knows whether inflation will be high or low. Even long-lasting contracts will take the actual inflation rate into account, since all future inflation rates are known with certainty. Inflation will alternate between a high level and a low level, depending on which party is in power.
2. There is a time-inconsistency problem with an announcement that new buildings will be exempt from rent-control laws. Before new housing is built, a city has an incentive to promise this exemption: landlords then expect to receive high rents from the new housing they provide. Once the new housing has been built, however, a city has an incentive to renege on its promise not to extend rent control. That way, many tenants gain while a few landlords lose. The problem is that builders might expect the city to renege on its promise; as a result, they may not build new buildings.
 3. The Federal Reserve web site (www.federalreserve.gov) has many items that are relevant to a macroeconomics course. For example, following the links to "Monetary Policy" (<http://www.federalreserve.gov/policy.htm>) take you to material from the Federal Open Market Committee meetings and to testimony given by the Federal Reserve Chairman twice a year to Congress. Other links take you to speeches or testimony by the Chairman or members of the Board of Governors of the Federal Reserve System. Note that the web site also contains many items that are not related to macroeconomics. (For example, if you check the "Press Release" link on the web site, you are likely to find many items that concern regulatory matters, since the Federal Reserve plays an important role in regulating the banking system.)

More Problems and Applications to Chapter 15

1. a. In the model so far, nothing happens to the inflation rate when the natural rate of unemployment changes.
- b. The new loss function is

$$L(u, \pi) = u^2 + \gamma\pi^2.$$

The first step is to solve for the Fed's choice of inflation, for any given inflationary expectations. Substituting the Phillips curve into the loss function, we find:

$$L(u, \pi) = [u^n - \alpha(\pi - E\pi)]^2 + \gamma\pi^2.$$

We now differentiate with respect to inflation π , and set this first-order condition equal to zero:

$$dL/d\pi = 2\alpha^2(\pi - E\pi) - 2\alpha u^n + 2\gamma\pi = 0$$

or,

$$\pi = (\alpha^2 E\pi + \alpha u^n)/(\alpha^2 + \gamma).$$

Of course, rational agents understand that the Fed will choose this level of inflation. Expected inflation equals actual inflation, so the above equation simplifies to:

$$\pi = \alpha u^n/\gamma.$$

- c. When the natural rate of unemployment rises, the inflation rate also rises. Why? The Fed's dislike for a marginal increase in unemployment now rises as unemployment rises. Hence, private agents know that the Fed has a greater incentive to inflate when the natural rate is higher. Hence, the equilibrium inflation rate also rises.
- d. Appointing a conservative central banker means that γ rises. Hence, the equilibrium inflation rate falls. What happens to unemployment depends on how quickly inflationary expectations adjust. If they adjust immediately, then there is no change in unemployment, which remains at the natural rate. If expectations adjust slowly, however, then, from the Phillips curve, the fall in inflation causes unemployment to rise above the natural rate.