

Answers to Questions: Chapter 13

1.
 - a. Exogenous variables and parameters: $t, T_a, G, NX_a, C'_a, I'_p, M^s/P, s, nx, c$ or $(1 - s), b, f, h$.
 - b. Endogenous variables: Y, r .
 - c. Target variables: Y, r .
 - d. Policy instruments: $t, T_a, G, M^s/P$ (since P doesn't vary, setting M^s determines M^s/P).
 - e. The endogenous variables are identical to the target variables.
 - f. The policy instruments are a subset of the exogenous variables.
2. The monetary policy variable is M^s , or M^s/P , since P is constant. The fiscal policy variables are t, T_a , and G .
3. There are four policy instruments. There are two target variables. Yes, there are at least two policy instruments. Hence, they are sufficient in number to determine the targets.
4. Rules advocates argue that the private economy is stable and that there are no significant or lengthy demand disturbances as long as fixed, stable policies are followed. Monetarists argue that activist policy is *undesirable* because it is disruptive.
5. Under a rigid rule, there would be no change in the policy instrument. For example, under the constant growth rate rule (CGRR), the growth rate of the money supply would be fixed at some rate, say 4 percent, regardless of what was happening in the economy. With a feedback rule, the policy instrument would change by some specific amount in response to a change in the target variable (e.g., an increase in the growth rate of the money supply by 2 percent in response to an increase in the unemployment rate of one percentage point).
6. Activists tend to be very pessimistic about the self-correcting powers of the private economy and optimistic about the efficacy of stabilization policy. Rules advocates have opposite beliefs.
7. Like the activists, those advocating a CGRR (monetarists) believe that stable growth of nominal GDP is the most desirable target. Because the monetarists believe in the stability of the private sector (both commodity and monetary sectors), however, they believe that a stable growth rate of the money supply will mean a stable growth rate of nominal GDP. Thus, the monetarists, like the activists, care about the rate of real output and the level of employment; however, they disagree about the best approach in achieving the desired rate and level.

8. If the demand for money is stable, then the velocity of money grows at a steady and predictable rate. The monetarists argue that, in this case, a constant growth rate rule for the money supply would imply a stable growth of nominal GDP. If, however, the demand for money is unstable, rigid control of the money supply does not achieve rigid control of nominal GDP. In fact, with unstable money demand, the Fed would do better with an interest-rate target than a money-supply target.
9. The *data lag* refers to the time that elapses before data to measure changes in economic conditions are gathered, processed, and made available to policymakers. The *recognition lag* occurs because policymakers need data for more than one reporting period (and may need it for several periods) in order to detect trends in the economy. The *legislative lag* measures the time required to choose an appropriate policy response after an undesirable trend is detected. The *transmission lag* is the time needed to change the policy instruments once the policy response has been chosen. The *effectiveness lag* denotes the amount of time that passes before changes in the policy instruments produce changes in real output and other target variables.
10. If the lag in the policy effect is long and variable, the policymaker cannot know, beforehand, if the policy will be stabilizing or destabilizing when it finally takes effect. If the lag is long but fixed, the policymaker can predict when the policy will take effect; however, the policy will work in this case only if the policymaker is able to forecast accurately the movements of the economy.
11. Suppose policymakers knew precisely how much change in a target variable was required to produce the desired policy outcome. Suppose they also had decided which policy instrument they would use to produce the result. For example, suppose policymakers desired to increase real GDP by \$10 billion by raising government expenditures. They could not produce that outcome with certainty, however, unless they knew exactly how much change in the target variable would be produced. This requires certain knowledge of multiplier effects. For example, if the government spending multiplier was known with certainty to be two, then an increase in government spending of \$5 billion would produce the desired effect.
12. The effectiveness lag using the data presented in Figure 13-2 is measured as how long it takes for half of the ultimate effect of a change in monetary policy to be felt. The effectiveness lag increased slightly from 13.8 months to 14.1 months between the periods 1961–75 and 1975–90. But then there was a substantial increase in the effectiveness lag, from 14.1 months for the period from 1975–90 to 21.6 months for the period 1991–2010. Three factors contributed to the decline in the effectiveness of monetary policy. First, financial deregulation made housing expenditures less sensitive to changes in the interest rate. Second, more consumer expenditures are now financed

through credit card usage and credit card interest rates are very insensitive to a change in monetary policy. Finally, interest rates affect exchange rates, which in turn affect net exports, but with a long lag of two years or more.

13. The rise in volatility in the late 1960s was caused by the large positive shock to demand that came from military spending on the Vietnam War. That shock resulted in a positive output gap and drove up volatility as shown in Figure 13-3. Figure 13-3 shows that the jumps in volatility in the early 1980s and since 2007 resulted from the development of large negative output gaps. The negative output gap in the early 1980s was the result of the large negative shock to demand caused by the Fed's effort to reduce inflation. The collapse of housing and stock prices was the negative demand shock that caused a large negative output gap to develop since 2007.
14. First, smaller demand and supply shocks can have less adverse affects on the economy between the time they occur and when data become available to monetary policymakers and those policymakers evaluate the data and recognize the need to change policy in reaction to the shocks. Second, because there is a trade-off between more unemployment and more inflation when there is an adverse supply shock, it may take longer for consensus to develop among Fed policymakers as to how to respond to the adverse supply shock. Therefore, the legislative lag becomes less of a problem if supply shocks are smaller. Finally, the fact that the effectiveness lack for monetary policy is so long is less of a problem for monetary policymakers with smaller supply and demand shocks for the simple reason that the magnitude of the shocks require less work by monetary policy to overcome the effects of those shocks on the economy.
15. During the late 1980s inflation rose as the output gap increased. In contrast, inflation was falling in the late 1990s despite the rise in the output gap. Therefore the Fed did not raise the federal funds rate until 2000, unlike the late 1980s when the increases in inflation and the output gap resulted in the Fed raising the federal funds rate.
16.
 - a. If the public finds the announcement credible, then the SP curve will shift down because it believes that policymakers will reduce the growth of nominal GDP enough to reduce inflation. If policymakers stick to their announced policy, then as the SP curve shifts down, then the decrease in nominal GDP shifts down the DG curve down by the same amount that the SP curve shifts down, resulting in a lower inflation rate, but no change in either the output ratio or the unemployment rate.
 - b. If the public finds the announcement credible, then the SP curve will shift down because it believes that policymakers will reduce the growth of nominal GDP enough to reduce inflation. However, if policymakers abandon their announced policy, then as the SP curve shifts down, there is a movement down the exiting DG curve. Again there is a lower inflation rate, but not as large as the public expects because there is

- no reduction in the growth of nominal GDP. Since the inflation rate, while lower, is higher than the public expects, the output ratio rises and the unemployment rate declines. Once the public realizes that policymakers have not reduced the growth rate of nominal GDP, then the inflation rate, the output ratio, and the unemployment rate will return to their original levels as the *SP* curve shifts back to its original position.
- c. If the public does not find the announcement credible, then the *SP* curve does not shift down in response to the announcement. However, since policymakers stick to their announced policy, the decrease in nominal GDP shifts down the *DG* curve, causing a movement down the existing the *SP* curve, resulting in a lower inflation rate, a reduction in the output ratio, and a rise in the unemployment rate. The economy will then proceed in a downward loop as depicted in Section 9-7.
- d. If the public does not find the announcement credible and policymakers abandon their announced policy of reducing the growth rate of nominal GDP, then neither the *SP* curve nor the *DG* curve shift. Therefore there is no change in either the inflation rate or the output ratio or the unemployment rate.
17. If the Fed's response to a supply shock is neutral, then as shown in Chapter 9, a supply shock results in equal changes in the inflation rate and the output ratio, although in opposite directions. This indicates that the Fed's response is putting equal weight on inflation and output. If the Fed's response to the supply shock is accommodating, then it maintains the level of output, while allowing a change in the rate of inflation. This indicates that the Fed is putting no weight on inflation and all of its weight on output. Finally, if the Fed's response to the supply shock is extinguishing, then it maintains the rate of inflation, while allowing a change in the output ratio. This indicates that the Fed is putting all its weight on inflation and no weight on output.
18. Reducing inflation from 5 percent to zero will cause temporary reductions in the output ratio and increases in unemployment. These costs occur before the economy receives the benefits of zero inflation; thus their present value likely will outweigh that of the benefits of reduced inflation for policymakers whose time horizon is short and who discount future benefits at a high discount rate. The longer a policymaker's time horizon and the lower the discount rate, the more weight he or she assigns the benefits of reduced inflation in the policy decision.
19. Figure 13-5 shows that the federal funds rate consistent with the Taylor Rule would have been negative in 2010. However since the federal funds rate cannot fall below zero, the Zero Lower Bound meant that monetary policy could not provide as much stimulus as implied by the Taylor Rule in 2010.
20. A nominal anchor is a rule that sets a limit on the growth rate of a nominal variable such as high-powered money, or the price level, or nominal GDP. The advantage of a nominal

anchor is that by targeting a nominal value, an upper limit is placed on the rate inflation. That upper bound provides a guide for consumers and business in forming expectations about future inflation. Economists and policymakers sometimes refer to this effect as saying that inflationary expectations are well anchored.

A nominal GDP growth rate rule is the same as a Taylor Rule which places equal weight on inflation and output growth in that the nominal GDP growth rate equals the rate of inflation plus the real GDP growth rate. Therefore, both target the growth of a nominal variable, in this case nominal GDP, and therefore, place a limit on how high inflation can be.

The difference between a Taylor Rule, which places equal weight on inflation and output growth, with one that places equal weight on inflation and the output ratio is that when the output ratio is quite low, as in the early 1980s, or quite high, as in the late 1960s, the Fed has more flexibility in adjusting interest rates than if it is limited by how fast real GDP can grow.

21. If effectiveness lags are long and variable, then policymakers should base their actions on what they expect the state of the economy to be when their policies have an effect on the economy. Therefore, policymakers need to use their best forecasts of target variables in determining the actions that they take to influence those variables.

In raising interest rates in 1994, the Fed appeared to have taken action anticipating that the economy would be operating near natural real GDP by the time the higher interest rates had the desired affect of slowing the growth of the economy. Similarly, the Fed acted quickly in early 2001 to sharply lower interest rates in anticipation of the recession that started in March of that year.

22. The arguments for exchange-rate targeting are that it can signal a central bank's commitment to follow a rule for money supply growth, lending credibility to policymakers' pronounced desires to lower inflation and helping them overcome the time inconsistency problem. The arguments against a fixed exchange-rate policy include the fact that the central bank relinquishes its ability to use monetary policy in pursuit of domestic policy objectives and the possibility that the commitment to a fixed exchange rate itself may lack credibility in the absence of additional constraints on policymakers.
23. There are three arguments to support the euro. First, a common currency for members of the Economic and Monetary Union eliminates the risks of exchange rate fluctuations and the costs of exchanging currencies in commerce between countries within the union. Second, the use of a common currency is a way to force on all members of the union the monetary policies of Germany which resulted in low inflation. Third, the criteria for

inclusion in the euro could force fiscal discipline on members wishing to use the euro as a currency.

There are three arguments against the euro as well. First, the members of the union give up independent monetary policy to the European Central Bank. This is important if shocks do not impact all countries equally. Second, the uncoordinated fiscal policies of the euro zone nations can create a financial crisis of the sort brought on by Greece's large fiscal deficit in 2010. Third, the lack of a common language within Europe means that labor markets adjust slowly to shocks having differential impacts on member nations. It is difficult for a worker in Spain, where unemployment might be high, to move to Germany when jobs are more readily available because different languages are spoken in the two countries.