1 Monetary Policy by a Taylor Rule

Suppose that the Fed were committed to the following Taylor-style policy rule for the Federal Funds rate: $i^{FF} = \pi + 0.02 + 0.5(\pi - \pi^*) + 0.5\hat{Y}$, where $i^{FF}$ is the nominal Federal Funds rate, $\pi$ is the annual inflation rate, $\pi^* = 2\%$ is the target inflation rate, and $\hat{Y}$ is the deviation of output from potential (i.e., $\hat{Y} = Y - \bar{Y}$).

For each of the following shocks, determine the effects of the policy prescribed by the Taylor Rule on the Federal Funds rate, output, and inflation. Would the policy reaction be stabilizing, destabilizing, or neutral relative to leaving the money supply unchanged after the shock?

a. A temporary boost in government purchases.

Solution: If the money supply is left unchanged, a temporary boost in government purchases would push the aggregate demand curve up and to the right, increasing the price level and inflation and increasing output. In response to both of these changes ($\hat{Y} > 0$, $\pi > \pi^*$), adhering to the Taylor rule requires increasing the nominal Fed funds rate, which means the money supply is decreased. The decrease in the money supply shifts the aggregate demand curve down and to the left and helps stabilize the economy back toward full employment output.

b. A negative technology shock.

Solution: If the money supply is left unchanged, an adverse technology shock (i.e., supply shock) causes the aggregate supply curve to shift up and to the left, increasing the price level and inflation and decreasing output. Without more information, the Taylor rule is ambiguous about which way to move the nominal Fed funds rate in response to these changes ($\hat{Y} < 0$, $\pi > \pi^*$), since higher inflation calls for increasing the funds rate but lower output calls for decreasing the funds rate. The net impact on the funds rate will depend on the magnitude of the increase in output relative to that of inflation, which in turn depends on the relative slopes of the AS and AD curves. The Fed cannot stabilize both inflation and output by simply following the Taylor rule.

c. An increase in money demand.

Solution: If the money supply is left unchanged, an increase in money demand causes the aggregate demand curve to shift down and to the left, reducing the price level and inflation and decreasing output. In response to these changes in output and inflation ($\hat{Y} < 0$, $\pi < \pi^*$), adhering to the Taylor rule requires decreasing the nominal Fed funds rate, which means the money supply is increased. This shifts the aggregate demand curve up and to the right and helps stabilize the economy.

d. A drop in consumer confidence.

Solution: If the money supply is left unchanged, a decline in consumer confidence causes the aggregate demand curve to shift down and to the left, reducing the price level and inflation and decreasing output. The Taylor Rule implications are the same as the answer to (c).

2 Contemporary Monetary Policy

Pick one of the following two short texts and analyze its discussion of contemporary monetary policy using the tools and framework of analysis covered in this course. How does the content relate to our discussion of monetary policy goals, strategies, and policy instruments? How does the discussion of monetary policy and the real interest rate map into our IS/LM-AS/AD framework? And where does it seem to most closely fit among the competing theories of the business cycle we have studied?
3 Shocks to the Money Supply

How would each of the following developments affect the U.S. monetary base, money multiplier, and money supply? Explain.

a. The Federal Open Market Committee decides to purchase $40 billion of mortgage-backed securities every month (like the third round of “quantitative easing” purchases initiated in 2012).

**Solution:** The open market operations increase the monetary base, increasing banks’ reserves and decreasing banks’ holdings of MBS. The increase in the monetary base leads to an increase in the money supply through multiple expansions of loans and deposits. The money multiplier is likely unchanged.

b. A financial crisis prompts households to sell off some of their stock market portfolio and deposit the proceeds into bank accounts covered by deposit insurance.

**Solution:** As people sell their stocks and increase their deposits, the currency-deposit ratio will decline. This causes the money multiplier to increase, which causes the money supply to increase. The monetary base is unchanged, assuming households’ sale of securities does not change the securities holdings of the central bank or banking sector (e.g., households sell stocks to the non-financial corporate sector or foreigners).

c. Higher expected inflation makes both households and banks less willing to hold cash.

**Solution:** The decreased holding of cash by households lowers the currency-deposit ratio, increasing the money multiplier and causing the money supply to rise. The decreased willingness of banks to hold cash lowers the reserve-deposit ratio, which also increases the money multiplier and causes the money supply to rise further for a given monetary base.

d. Banks decide to hold more excess reserves.

**Solution:** The increase in banks’ reserve-deposit ratio reduces the money multiplier, causing the money supply to decline. The monetary base is unchanged.