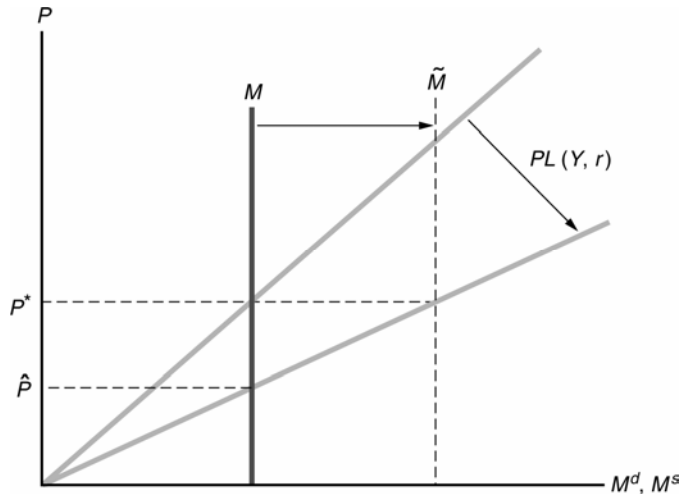


**Problem Set #8**  
**Suggested solutions**

7. (Chapter 10) Implementing a nominal interest rate rule.
- (a) This increase in housing construction may arise from household confidence, for example after an increase in the stock price. Thus we have a temporary increase in money demand with a reduction in prices. To lower the nominal interest rate, the monetary authority increases the money supply, which raises prices to the previous level. Price stabilization is successful.
  - (b) This is like a drop in current total factor productivity with no consequence for future total factor productivity. Thus, we have a shift to the left of output supply, reducing output and increasing the real interest rate. Money demand thus drops and prices increase. The monetary authority should react by increasing the money supply to reduce the nominal interest rate to the target, but this increases prices further. Prices are then not stable as intended.
  - (c) We learn that total factor productivity is up, and permanently so. This implies that both output demand and supply increase, the real interest rate drops, and that money demand shifts to the right leading to lower prices. Under a nominal interest rate target rule, the monetary authority would increase the nominal interest rate by reducing the money supply, thus further reducing prices. Prices are then not stable as intended.

8. (Chapter 10) Textbook Chapter 9 discusses the likely effects of a permanent increase in government spending in the real intertemporal model. As depicted in textbook Figure 9.18, a permanent increase in government spending increases output. This effect works in the direction of increasing the demand for money. In the figure below, the initial price level is  $P^*$ . With the money supply fixed at  $M$ , the price level decreases to  $\hat{P}$ . To keep the price level at  $P^*$ , the money supply must increase to  $\tilde{M}$ . If the central bank were pursuing a policy of price-level stabilization, the central bank would find it useful to be able to accurately predict the advent of this disturbance.



1. (Chapter 11) The response to a temporary change in government spending in the real business cycle model is the same as the response to such a disturbance in the monetary intertemporal model, as the two models are equivalent. Government spending shocks in this model wrongly predict that consumption, investment, and the real wage are countercyclical. In response to a temporary increase in government spending, output increases and the real interest rate increases. Because the net effect on money demand is ambiguous, the effect on the price level is also ambiguous. Therefore, there can be no contradiction of model's predictions on the cyclical behavior of the price level.

3. (Chapter 11) Business optimism about future total factor productivity.
  - (a) First consider the fundamental effects of the increase in expected future total factor productivity. Such a disturbance shifts the aggregate demand curve to the right. In the coordination failure model, this results in an increase in output and employment in the good equilibrium and a decrease in output and employment in the bad equilibrium. The increased optimism might also move the economy from the original bad equilibrium to the new good equilibrium.
  - (b) Let us focus on the effects of changes in future total factor productivity on the good equilibrium. This disturbance shifts the aggregate demand curve to the right. The good equilibrium is at higher levels of output and employment, and a lower real interest rate. In the labor market, the reduction in the real interest rate also increases the real wage rate. The decrease in the real interest rate increases consumption spending. The increase in the real interest rate likely mitigates, but does not reverse, the direction of the effect of the disturbance on investment. All of these effects are consistent with the business cycle facts. Finally, the increase in output and the reduction in the real interest rate both work to increase money demand. The price level therefore decreases, which is also consistent with the business cycle facts.
  - (c) The increased optimism decreases the price level in the good equilibrium. Therefore, the monetary authority should increase the money supply when firms become more optimistic and reduce the money supply when firms become more pessimistic. Note that if the money supply is a sunspot variable, there may be a difficulty with reducing the money supply when firms become more pessimistic. This policy response is therefore consistent with the nominal money supply being procyclical. Such a change in the money supply may also shift the economy from the good equilibrium to the bad equilibrium, and this factor obviously greatly complicates the analysis.