Solution to Exercise 6

Problem 2, chapter 11:

The impact of this tax is equivalent to an increase in the credit card cost \( q \) for firms and households. In equilibrium, it has to be that \( q + t = R \), and \( X^c \) is shifted down. This results in an increase in money demand, and thus lowers the price level. This comes about because households and firms shift from credit card balances to cash and more transactions are operated with the same amount of money.

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Problem 4, chapter 11

The real effects of a temporary increase in government spending are the same as those in the real intertemporal model. In the output market, aggregate demand for output shifts right. However, this also implies that there will be an increase in the present value of taxes, thus consumer's net wealth decreases. This causes a reduction in current consumption and leisure, and labor supply curves shifts right in the labor market, and output supply curve also shifts right in the output market. We know that output must increase, but the real interest rate can increase of decrease. If the real interest increases, labor supply will shift right again due to the intertemporal substitution of labor effect (through \( \frac{(1+r)W}{W'} \)), all else equal. If real interest rate falls, labor supply will shift left. Regardless, however, since output must increase, labor input must increase, and therefore the real wage must decrease. For the purpose of this exercise, I am going to assume that the real interest rate increases, as shown in the diagram below. The increase in income causes money demand to increase. The increase in the real interest rate causes the demand for money to decrease. With a fixed supply of money, the price level must change to keep money supply and money demand equal. If the income effect on money demand is stronger, then prices must decrease, and this is the case shown in the diagram. If the interest rate effect on money demand is stronger, then prices must increase.
Problem 1, chapter 12:

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. Thus, the diagrams above are the same diagrams for this problem. Since the effect on the equilibrium real interest rate is ambiguous, investment could increase or decrease, and therefore does not contradict the observed business cycle fact of a procyclical. Consumption could be procyclical or countercyclical, since depending on whether real interest rate increases or decreases, consumption could increase or decrease. Moreover, increase in expected taxes is offset by an increase in current income. Again, this does not contradict the observed procyclical behavior of consumption. Government spending shocks in this model wrongly predict the real wage are countercyclical. Because the net effect on money demand is ambiguous, the effect on the price level is also ambiguous. Therefore, the model is not inconsistent with the observed countercyclical behavior of the price level.