

Homework 3
Due in class on Monday March 30

Instructions:

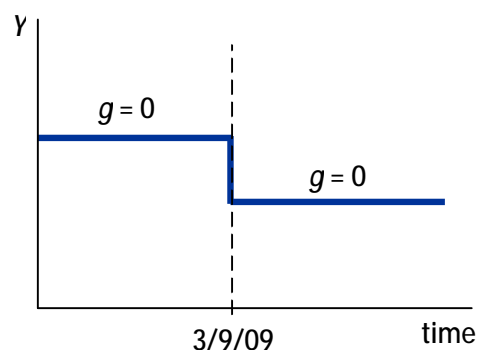
Print this file and write your answers directly on it. Give it to me in class on the due date. You need not turn in this first sheet, as it only contains the instructions. Staple the remaining sheets together and write your name in the upper right corner of the first of those pages.

In class, during the week of March 9-13, we combined the asset and monetary approaches to examine in detail the effects of a one-time permanent increase in the money supply. We got the same long-run results as using the much simpler monetary approach, but we got different short-run results and much richer transition dynamics (e.g., we saw that the exchange rate initially overshoots its eventual long-run value). To refresh your memory, I have attached a one-page outline of the steps we followed (do not include it when you turn in your HW3). You can also find this analysis in Section 4 of Chapter 4/15. It would be useful to review this material before doing this homework assignment.

This homework assignment asks you to do another experiment using the combined asset/monetary approaches. The experiment is an income shock, which you will recall you analyzed on Exam 1 using each approach separately. Before doing this assignment, review the detailed answer key to Exam 1, especially Problem 2 (p.5 of the Exam) "An income shock in the Asset Approach." That problem asked you to work through the short-run effects of a temporary decrease in real GDP. For this homework assignment, your job is to use the combined asset & monetary approach to determine the short-run, transition, and long-run effects of a permanent decrease in income on all endogenous variables.

Simplifying assumptions for HW3:

As on Exam Problem 2 (p.5), assume the following: the growth rates of the nominal money supply and real GDP are zero, but real GDP permanently decreases on March 9. Thus, the behavior of real GDP over time is as shown in this time-series graph, while M is constant before, during, and after 3/9/09. Also assume the foreign inflation rate is zero.



The specific questions you are to answer for HW3 appear on the next page.

HW3 – An Income Shock in the Combined Asset & Monetary Approaches

2. Determine short-run effects using the asset approach. For each, briefly explain your answer. (Note that your answers here may be different than the answers on the asset approach problem on Exam 1 because the income shock here is permanent, not temporary.)
- a. On the graphs below, draw the initial (pre-shock) equilibrium in the money and FX markets. Label the initial equilibrium point A in both graphs. As always, label all curves and axes correctly. On the appropriate axes, label the initial values of i and E as i_1 and E_1 .

Money Market



Foreign Exchange Market



- b. On March 9, Y falls. In the money market diagram, which curve shifts? Explain. What (if anything) happens to i ? Illustrate on your money market diagram. Label the new equilibrium " B_{SR} ," and if the new short-run equilibrium value of i is different than before, label it i_{SR} on the vertical axis.
- c. What happens to the expected future exchange rate on March 9? Explain. Show the effects of this and of the fall in Y in your FX market diagram above. Explain any curve shifts. What (if anything) happens to E ? Illustrate on your FX market diagram. Label the new equilibrium " B_{SR} ," and if the new short-run equilibrium value of E is different than before, label it E_{SR} on the horizontal axis.

HW3 – An Income Shock in the Combined Asset & Monetary Approaches

3. Transition from SR to LR equilibrium.

Hint: to determine the transition dynamics, compare the new SR equilibrium from 2 to the new LR equilibrium from 1 and deduce what must change to move the economy from the SR to the LR.

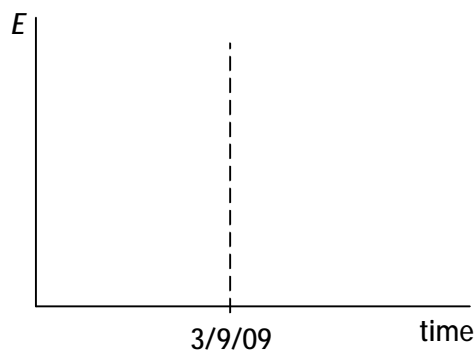
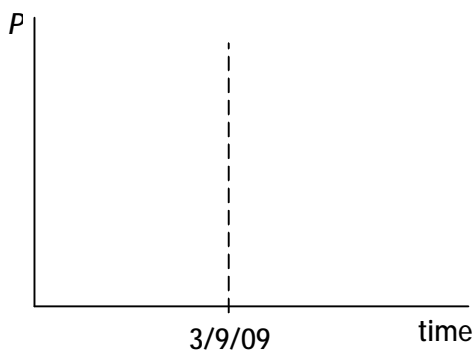
- a. In the money market, what happens to P in the transition from the SR to the LR? Why?

- b. In the money market, what happens to M/P in the transition from the SR to the LR? Why?

- c. In the money market diagram above, show the eventual long-run equilibrium as point C.

- d. In the FX market, explain any changes that occur. Illustrate them on the diagram above, and label the long-run equilibrium point C. Label the long-run exchange rate E_{LR} on the horizontal axis.

- e. On the axes provided, draw time-series diagrams showing the behavior of P and E , including the transitional dynamics. Does the exchange rate overshoot its eventual long-run value (yes or no)?



The short-run and long-run effects of a permanent increase
in the U.S. (home country) money supply, from class March 9-13

For simplicity, assume: $m = g = 0$ and $p_f = 0$. Also, assume $r^* = 3$.

On 3/11/2009, the Fed increases M by 10%. This is a one-time, permanent increase in the level of M . The growth rate of M remains at zero.

1. Long-run analysis

- What is the U.S. inflation rate before 3/11/2009? What is the inflation rate after 3/11/2009?
- What is the nominal interest rate before 3/11/2009? What is the nominal interest rate after?
- What is the growth rate of the real money supply M/P before 3/11/2009? After?
- Does real money demand $L(i)Y$ change on 3/11/2009?
- Does the real money supply M/P change on 3/11/2009?
- Draw a time-series diagram of M/P .
- What happens to P on 3/11/2009?
- Draw a time-series diagram of P .
- What is the rate of depreciation $\Delta E/E$ before 3/11/2009? After?
- What happens to E on 3/11/2009?
- Draw a time-series diagram of E .

2. Short-run analysis

- On 3/11/2009, M rises by 10%. One other exogenous variable changes – what is it?
- P is fixed in the short run. Show what happens in the money market.
What happens to i in the short run?
- In the FX market diagram, determine whether either or both curves shift in the short run, and explain the intuition for any shifts. Show on the diagram.
- What happens to the spot exchange rate E in the short run?

3. Transition from short-run equilibrium to long-run equilibrium

- Money Market:
What must happen to P in the transition period? M/P ?
Show these changes on the diagram, and show what happens to the equilibrium interest rate.
- FX Market:
What must happen to the DR curve in the transition period?
Show on diagram, and show what happens to the equilibrium exchange rate.

4. Summary

- Draw time-series diagrams of P and E incorporating the short-run, transition dynamics, and long run. Notice that in the short run, E overshoots its new long-run equilibrium value. A lesson is that monetary policy changes contribute to short-run exchange rate volatility.