

Answer to Assignment 4

Answer:1 The FE line: $\bar{Y} = 720$.

One way to express the IS curve is (use $Y=C+I+G$ or $S=I$):

$$Y = 1500 + 10G - 9T - 60000r.$$

$$Y = 1920 - 60000r.$$

After substituting in for π^e , the LM curve is:

$$\frac{561}{P} = 0.8Y - 500r - 5.$$

In the long run $Y = \bar{Y}$, so that $Y^* = 720$, using the FE line.

Substitute this in the IS curve to get $r^* = 0.02$. Substituting our results in the consumption and investment schedules gives us: $C^* = 600$ and $I^* = -30$ (firms are running down inventories). $G^* = 150$, so the income-expenditure holds.

Next, the LM curve in the long-run intersects at $IS - FE$ intersection. So using these values of Y^* and r^* , along with $M^s = 561$ gives us the price level: $P^* = 1$.

In the labour market, the demand curve follows from:

$$MPN = A(100 - 2N) = w$$

so that in equilibrium,

$$10.82N = A(100 - 2N).$$

When $A = 1$ then $\bar{N} = 7.8$ and $w^* = 84.4$.

Answer:2 See Fig 9.8 of the text if treating the productivity shock as a temporary shock. If treating the shock as permanent: there is wealth effects, which shifts labour supply right, savings curve right, and investment curve left. These are all reasonable, but overall impacts on FE and IS are ambiguous depending on the relative magnitudes of the shifts of each curve.

Answer:3 The numerical question in 3 does not allow for these wealth effects and so matches up better with the first answer above Fig 9.8.

There is a fall in labour demand, which we can write in the general form as:

$$N^D = 50 - \frac{w}{2A}.$$

N^S is unchanged. Setting $N^D = N^S$ gives a general formula for the real wage, for which we can sub in the new value of $A = 0.9$:

$$w^* = \left(\frac{2A}{2A + 10.82} \right) * 541 = 77.16$$

So the wage falls. Employment falls as well, $\bar{N}' = 7.13$. *i.e.* The fall in labour demand reduces employment and real wages.

FE shifts left for two reasons : A falls, and also $\bar{N}$ falls because of lower labour demand.

In the short-run we are at the intersection of the IS and LM curves. In the long-run, LM shifts up to restore General equilibrium.

Using the new A and new $\bar{N}$ in the production function gives us $\bar{Y} = 595.9$.

We then find r from the IS curve. $r^* = 0.022$ So the real interest rate rise from 2% to 2.2%. Both consumption and investment fall due to the higher borrowing costs and depressed incomes: $C^* \approx 484.3, I^* \approx -38, G = 150$.

Finally we can find the new price level from the LM curve: $P^* \approx 1.22$. So the price level has risen, which shifted LM left to restore equilibrium (since in the short-run output was above its new full employment level, there was upward pressure on prices). This example illustrates the ‘stagflation’ phenomenon of the 1970’s oil price shocks.

Answer:4 See Fig 9.9 of the text.

Answer:5 To find the short-run effects, assume that prices do not adjust, so $P = 1$. We need the intersection of the IS and LM curves, which are given by:

$$\begin{aligned} \frac{580}{1} &= 0.8Y - 500r - 5, \\ Y &= 1920 - 60000r. \end{aligned}$$

Solving these two equations gives: $r = 0.0196$ and $Y = 743.5$. This implies

$$C = 100 + .9 * (743.5 - 120) - 2000 * 0.0196$$

$$C \approx 621.9$$

$$I = 50 - 4000 * 0.0196 \approx -28.4$$

$$Y = C + I + G = 621.9 + -28.4 + 150 = 743.5$$

So both C and I rise.

In the long run we return to the FE line, where $Y = 720$ and $r = 0.02$, since the IS curve has not shifted. To find the price adjustment that brings the economy there, use the LM curve:

$$\frac{580}{P} = 0.8(720) - 500(0.02) - 5 = 561$$

so that $P = 1.033$. Notice that the price level has risen, after a period of time, by exactly the same proportion as the money supply, 3.39%. This is an example of long-run monetary neutrality.

Answer:6

a) The PPP idea is that, over the long run and after adjusting for transportation costs, when we express the price of a common good sold in two countries in the same currency terms, it should cost the same amount. If not, people would buy the good in the cheaper country and sell it in the more expensive country. This action would force up prices in the cheaper country (increased demand), lower prices in the expensive country (increased supply). People could continue doing this until prices were “equalized” across the two countries.

b) Acceptable Answers:

1: The final good, burgers, are not really tradable goods. They can't easily be stored and transported. If you're old enough to remember the failure of MacDonald's delivery, this much is obvious... though their pizzas were tasty!

2: Burgers contain non-traded inputs, such as store rents (land isn't traded across countries) or even wages (there are limitations to labour mobility across countries).

For both 1 and 2, non-traded goods prices need not equalize.

3: Taxes differ across countries

4: PPP is a long-run concept. Short-run deviations are common.

c) Tradable goods prices are often similar, but non-tradable services are generally cheaper because of lower wages.

d) Purchase BigMacs in China for \$1.31, sell in Norway for \$7.05, earning a profit of \$5.74 USD/burger.