1. True/False

State whether each of the following statements is True or False, and justify your answer in 2-3 sentences and/or a simple diagram.

(a) *A country with a fixed exchange rate is unable to use fiscal policy to change the level of output (Y)*

   False.

   A country with a fixed exchange rate is unable to use *monetary* policy to affect output – fiscal policy is in fact more effective than under flexible exchange rates. See the discussion on page 429-30 of the textbook if you're not sure about this.

(b) *In an open economy IS-LM model with flexible exchange rates, a cut in taxes always leads to an increase in Y, an appreciation of the exchange rate and an increase in investment.*

   False.

   A cut in taxes results in a higher interest rate, higher output, and an appreciation of the exchange rate (see diagram below). However, the effect on investment is unclear. Remember that investment depends positively on Y, but negatively on i. Since Y and i both increase, the effect on I is ambiguous.
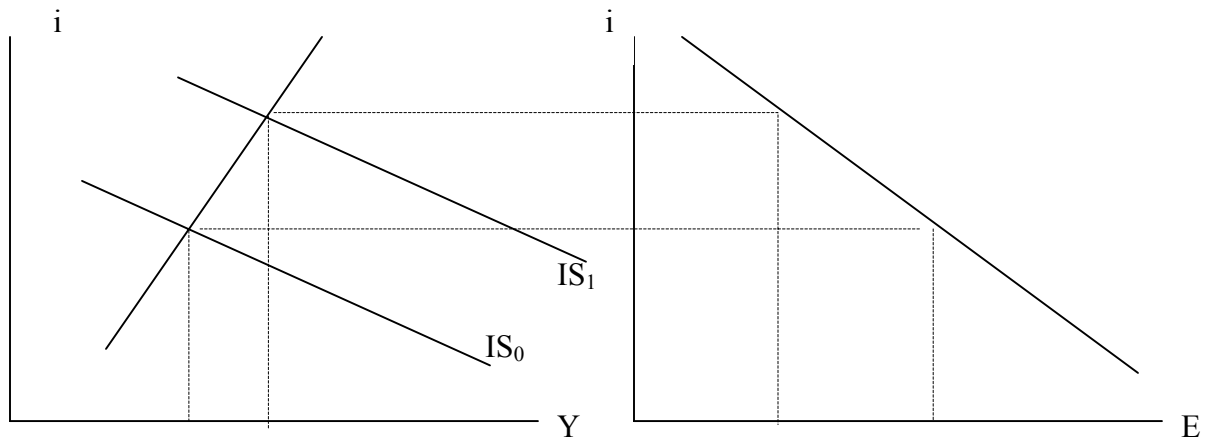
(c) If the IS curve is very flat, an increase in the domestic money supply causes a small depreciation of the exchange rate, and has a large effect on output.

True.

An increase in M/P shifts out the LM curve, causing higher Y and lower interest rates (and therefore an increase in E, ie. a depreciation of the exchange rate). As the diagram shows, when the IS curve is very flat, the change in i and E is small, and the effect on output is large.
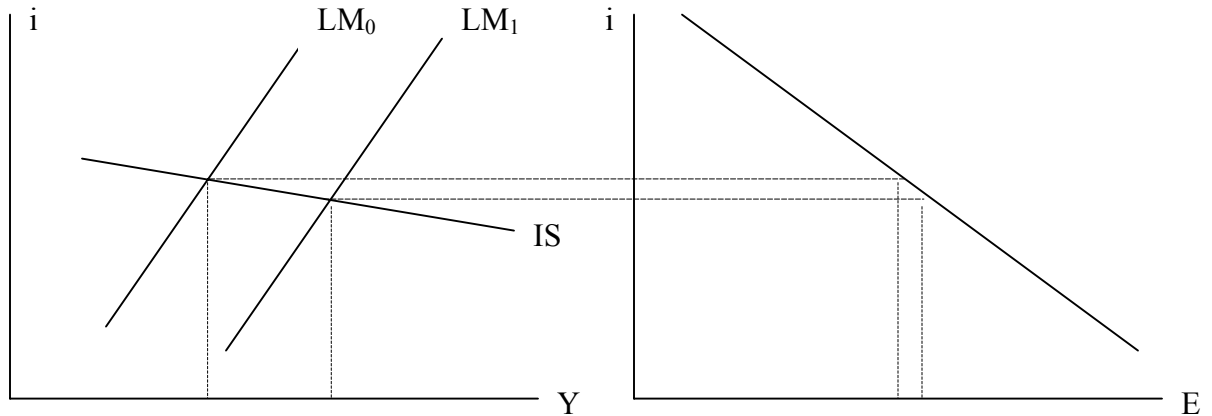
(d) In an open economy IS-LM model with flexible exchange rates, a decrease in the budget deficit (either by decreasing G or by increasing T) always leads to a decrease in the trade deficit as well, as long as the Marshall-Lerner conditions[1] hold.

True.

A decrease in the budget deficit shifts the IS curve inwards, leading to lower output and lower interest rates. As the diagram shows, it also leads to a higher level of E (ie. a depreciation). If the Marshall-Lerner conditions hold, higher E is associated with an improvement in the trade balance.

Since $NX = NX(Y,Y^*,E)$ depends negatively on Y and positively on E, net exports unambiguously increase following the decrease in the budget deficit. Y^* remains unchanged.

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[1] Recall that the Marshall-Lerner conditions are the algebraic conditions under which an exogenous increase in ε causes $NX = X - \varepsilon IM$ to increase.

(e) *If two economies have a fixed exchange rate, net capital flows between these two countries must be equal to zero.*

False.

It is not necessarily true that just because a country has a fixed exchange rate that it will have a current account deficit of zero. If it has a current account deficit (for example) this deficit must be financed by capital inflows. These inflows may well come in part from the country with which it has a fixed exchange rate.

(f) *The fact that interest rates affect the exchange rate in the open economy IS-LM model tends to make the IS curve flatter than it would be if interest rates only affected demand through investment (again, assume the Marshall-Lerner conditions hold).*

True.

Remember that $E = E^e / (1 + i - i^*)$. So an increase in i causes E to fall. As long as the Marshall-Lerner conditions hold, this will cause a fall in NX, and a downward shift in aggregate demand. So this means that a given increase in i causes a larger decline in output than in the case where a change in i only reduces Z by lowering investment.

(g) *If the exchange rate between two countries is fixed in the current period, the interest rate in the two countries must be the same, assuming there is perfect capital mobility.*

True.

Recall that $i = i^* + (E^e_{t+1} - E_t)/E_t$. So if the exchange rate is fixed, $E^e_{t+1} = E_t$, and i $= i^*$.

However, note that, even if the two countries currently have a fixed exchange rate, it is possible that people might expect the exchange rate regime to break down in the future, in which case $E^e_{t+1} \neq E_t$ and $i \neq i^*$. (If you said False but gave this as your answer, you would still get full points).

As an example, Mexico in the early 90s had substantially higher interest rates than the US, even though the Mexican peso was fixed against the US dollar. This reflected investors' expectations that there was some probability the exchange rate regime would break down and the Mexican currency would depreciate (as it eventually did).

2. Monetary policy shocks

Assume there are only two economies, Europe and the United States. The price level in both Europe and the US is constant and equal to 1. So the real exchange rate ε is always exactly the same as the nominal exchange rate E.

[NOTE: For the purposes of notation, when answering this question you should use an asterisk (*) to denote a European economic variable. (eg. US output is given by Y, while the output of Europe is denoted by Y*, etc.)].

Assume that the US behaves according to the basic open economy IS-LM model developed in Chapter 20 of the Blanchard (ie. the IS, LM and UIP equations on page 422 of the textbook).

(a)   Explain why E = 1/E*.

E is the number of dollars you can buy with one euro. E* is the number of euros you can buy with one dollar. If you can buy E dollars with one euro, you can buy 1 dollar with 1/E euro. So thus 1/E = E*.

Denote the initial exchange rate by E_0, initial US output by Y_0 etc. The European Central Bank decides to increase interest rates (i*) by an amount Δ by reducing the money supply M*/P*. (ie i* increases from i^*_0 to $i^*_0 + \Delta$).

(b)   Assume that the exchange rate between Europe and the US is floating (flexible). Show using an open economy IS-LM diagram what happens to the US economy following the increase in i*. [HINT: You will need to shift two different curves in the diagram]. State what happens to US interest rates, consumption, investment and the trade balance.

   Note that, when undertaking this exercise, you should for simplicity assume European output (Y*) remains constant. You should also assume there is no change in expected future exchange rates.

See diagram. Note that the uncovered interest parity curve is $E = E^e/[1 + i - i^*]$. So when i* increases, E is higher for any given i, which is why the curve in the right hand panel shifts out. Also, since NX = NX(Y,Y*, $E^e/[1 + i - i^*]$), an increase in i* also increases NX for a given Y (as long as the Marshall-Lerner conditions hold), which causes the IS curve to shift out.

So as you can see from the diagram, i increases (but by less than i*) because the IS curve shifts out. C is higher because Y is higher in equilibrium. Investment may increase or decrease (Y is higher, but i is also higher, and I = I(Y,i)).

How do we know for sure that i increases by less than i*? The answer is that, if i increased by more than i*, then E would actually *fall*, since $E = E^e/[1 + i - i^*]$. But this in turn implies that Y is lower than before (since E is lower, and i is higher, and all the other

variables determining Y are the same), which is inconsistent with the fact that the IS curve shifted outwards in the first place.
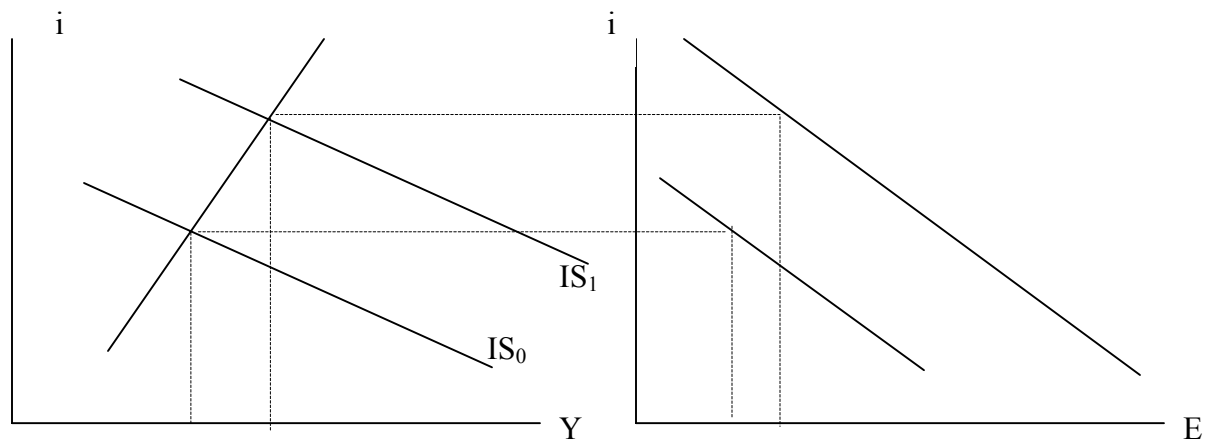
Finally, the change in the trade balance is definitely positive, but this part is tricky to understand. The easiest way is to think about an open economy goods market diagram. When E increases, ZZ shifts up relative to DD, since $ZZ = DD + NX(Y,Y^*,E)$

Thus, the trade balance improves. See the diagram below (note how beforehand the economy has a trade deficit, since $ZZ_0 < DD$ at the point where ZZ_0 meets the 45 degree line, but afterwards, the economy has a trade surplus, since $ZZ_1 < DD$ at the point where ZZ_1 meets the 45 degree line.
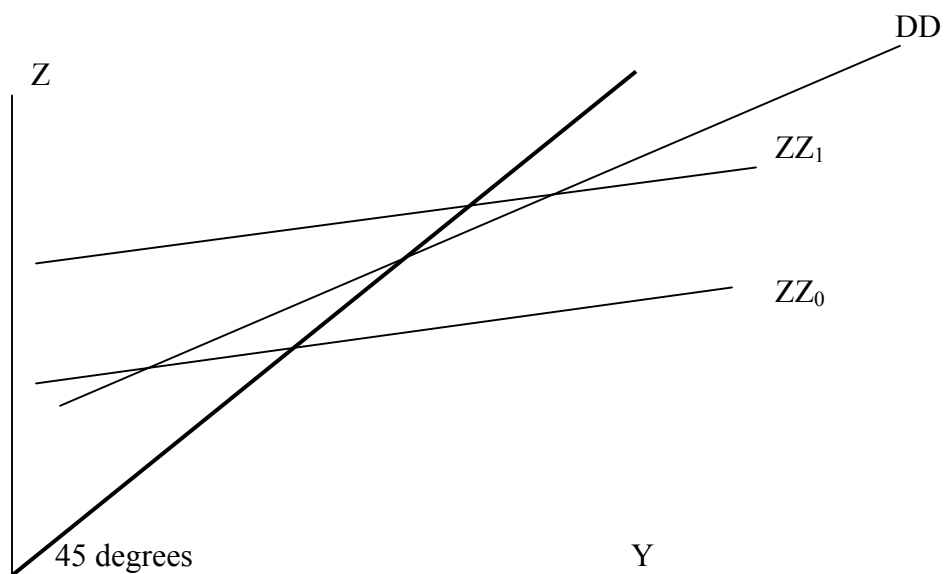
(c) Following on from part (b): Now assume that, when i* increases by Δ, there is a decline in European output also (ie. Y* falls to a level below Y*₀). How would this change your answers in part (b)?

Now, the answer is more ambiguous. As before, since the uncovered interest parity curve is $E = E^e/[1 + i - i*]$, when i* increases, E is higher for any given i, which is why the curve in the right hand panel shifts out.

Also, as before, since $NX = NX(Y, Y*, E^e/[1 + i - i*])$, an increase in i* also increases NX (as long as the Marshall-Lerner conditions hold), which causes the IS curve to shift out. But now, since Y* falls also, there is a counterbalancing effect causing NX to fall. So it is no longer clear whether the IS curve shifts outwards or inwards.

(d)   Following on from part (b): Now imagine that, rather than allowing the exchange rate to move, the US wanted to maintain the exchange rate E₀ that existed before the increase in i*. Show in a diagram what Fed would have to do in the financial market to achieve this.

Note that, in part (b), the exchange rate depreciates (ie. E increases) following the increase in i*. The reason is that i increases, but not by as much as i*. Since $E = E^e/[1 + i - i*]$

To return the exchange rate back to E₀, the Fed has to decrease the money supply, so that the LM curve shifts inwards. To do this, it would have to sell government bonds in an open market operation in financial markets. See diagram below.
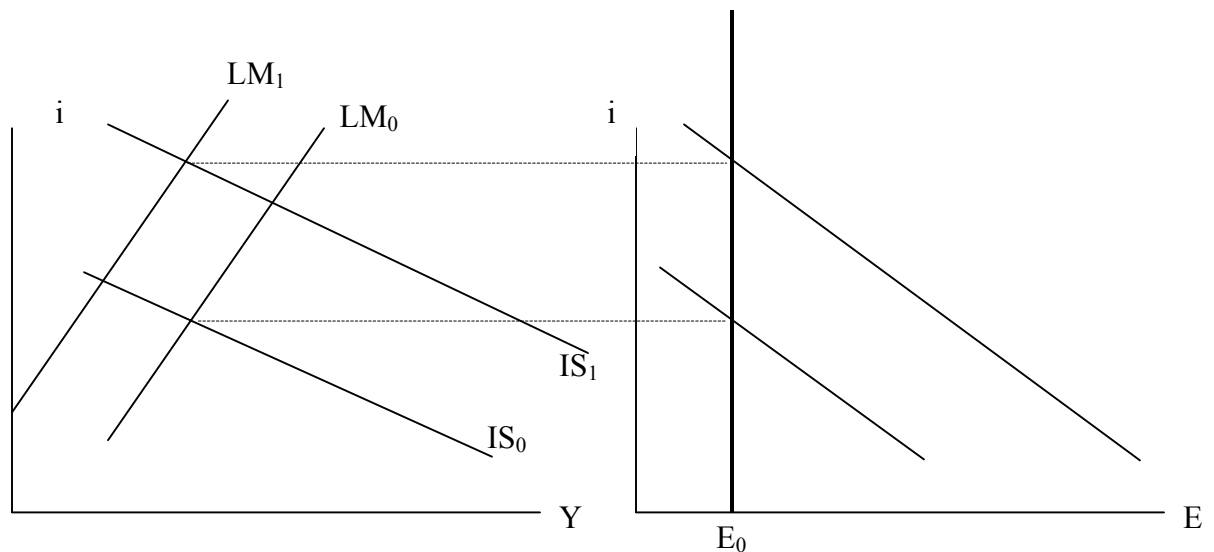
(e) *Following on from part (d): Show in a diagram how, in theory, government spending (rather than interest rates) could be used to return the exchange rate to E_0? Can you think of any practical real-world difficulties in using fiscal policy rather than monetary policy to shift the exchange rate (HINT: think about the time it would take for policy to have an effect)?*

It is true that alternatively, the US could use fiscal policy to return the exchange rate to its original level. By increasing government spending or reducing taxes, the government could cause the IS curve to shift outwards even further (from IS_1 to IS_2) causing i to increase further and returning the exchange rate to E_0. See the diagram for the details.

This approach to managing the exchange rate is not very realistic in practice though. The reason is that changes in fiscal policy affect the exchange rate only with a long and uncertain time lag. ie. G changes, which eventually causes a multiplied change in Y and a fall in i, which in turn is associated with a fall in E. In reality, monetary policy is a much more effective tool for managing the exchange rate, because the central bank can directly change interest rates very quickly if needed.
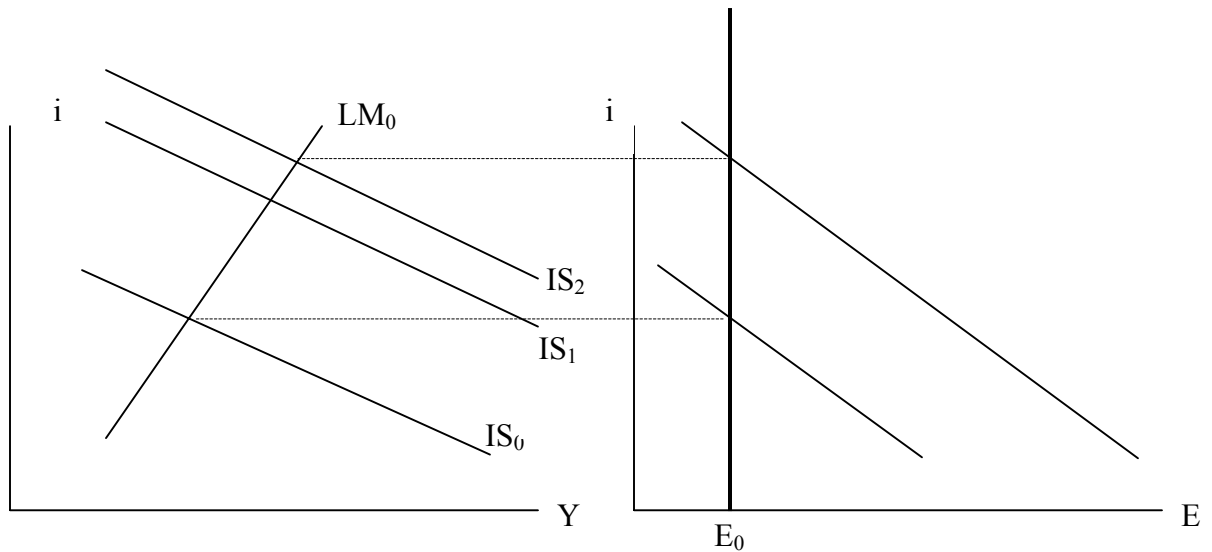
3. Fixed exchange rates: fair or foul?

Consider the following extract from a recent Reuters news article:

> *US Treasury Secretary John Snow told lawmakers in a letter earlier this month he wanted to see China move to a more flexible exchange rate "now" and promised he would keep up pressure on Beijing to do so.*
>
> *In the letter to senators, dated September 12 and a copy of which was obtained by Reuters, Snow reiterated his view that intervention in currency markets should be kept to a minimum.*
>
> *"It is clear to me that China should move toward greater flexibility in its exchange rate," said Snow's letter. "I would welcome a move toward greater flexibility now."*
>
> *Snow was responding to a request from Democratic senators Charles Schumer and Evan Bayh and Republican senators Elizabeth Dole and Lindsey Graham to investigate whether China's pegged exchange rate is harming the US economy.*
>
> *The bipartisan group said China's artificially weak currency makes Chinese exports cheap, undermining US producers' sales abroad and leading to job losses in the beleaguered US manufacturing sector.*

(a) *Explain in terms of the open economy IS-LM model why these politicians believe China's fixed exchange rate might be harming the US economy.*

If China is holding the real exchange rate of the yuan relative to the dollar 'too low', then floating the exchange rate will bring about a depreciation of the dollar, which in turn will improve the trade balance (assuming the Marshall-Lerner conditions hold). This will shift the IS curve upwards and to the right, which means a higher GDP in the new equilibrium under flexible exchange rate policy.

(b) *Can you think of some reasons why <u>China</u> might benefit from moving to a more flexible exchange rate?*

China's central bank can control either the exchange rate or the interest rate. By adopting a flexible exchange rate policy, China's central bank will be able to regain control over interest rates, so it will be able to use monetary policy as a stabilization tool, or to control inflation (which is currently quite high in China).

Also, by holding down the real exchange rate, China ensures that its imports are more expensive than they would otherwise be. Just as with a tariff on foreign goods, this is bad for Chinese living standards.

4. Labor markets

In recent years, the US unemployment rate has increased from 4% to 6%.

(a) *If the number of employed people in the US has fallen from 160m to 156m over the same period (these are not the correct numbers, just an example), what has happened to the number of unemployed people? What has happened to the size of the labor force?*

Remember:

$L \equiv$ labor force $\equiv$ the total number of people who are welling to work and looking actively for a job.

$U \equiv$ Unemployed people $\equiv$ total number of people who are welling to work and looking actively for a job, but haven't found a job yet $= u*L$.

$u =$ the rate of unemployment $= U/L$.

$N =$ Number of employed $= L-U = (1-u)*L$.

Therefore,

$L_0 = N/(1-u) = 160/(1-4\%) = 166.7m$

$U_0 = u*L = 4\%*166.7 = 6.7m$

$L_1 = N/(1-u) = 156/(1-6\%) = 166.0m$

$U_1 = u*L = 6\%*166 = 10.0m$

So, the labor force has decreased while the number of unemployed people has increased.

(b) *In response to rising unemployment, two economists suggest alternative schemes for helping out the jobless.*

1. *The first economist suggests a 'back-to-work' scheme, in which unemployed workers who find a job are given a $1000 grant by the government. Using the model in Chapter 6, what effect will this scheme have on 'z' (the catchall variable that captures shifts in the wage setting curve)? Show in a diagram how the equilibrium unemployment rate would change following the introduction of such a scheme.*

2. *The second economist suggests a 'help-the-poor' scheme, in which unemployment insurance payments are increased to lift the unemployed out of poverty. As you did in part (b), what effect will this scheme have on 'z'? Show in a diagram how the equilibrium unemployment rate would change following the introduction of such a scheme.*

Discuss the relative merits of these two schemes. Is one scheme necessarily 'better' than the other?

The 'back-to-work' scheme decreases z, whereas the 'help-the-poor' scheme increases z. Therefore, the first scheme shifts the WP curve downward and brings about a lower u_n, whereas the second scheme shifts WS curve upward and brings about a higher u_n (and

thus lower output Y_n). The intuition is quite straightforward: the first scheme encourages people to work, whereas the second scheme encourages people not to work.

The second scheme, however, may have better distributional effects. If the government's aim is to reduce poverty or the degree of income inequality, then the second scheme may possibly be better, even though it reduces output and increases unemployment.

The moral is that it is difficult to say one scheme is 'better' than the other, without specifying what society's (or the government's) objective is. But if the aim is simply to reduce unemployment, it is likely that the first scheme will be better.