Econ 305   Prof. Kasa
Intermediate Macroeconomic Theory   Spring 2009

PROBLEM SET 3
(Solutions)

1. The market-clearing approach attributes business cycle fluctuations to persistent, exogenous changes in productivity. Such changes shift both the Labor Supply and Labor Demand curves in the labor market, and the Output Supply and Output Demand curves in the goods market. (See Figure 11.3 in the text for an example). The model's predicted responses to these shifts reproduce many of the so-called 'business cycle facts' described in Chapter 3. It is theoretically *possible* that the current recession reflects a negative productivity shock (although since the model predicts a countercyclical price level, it would predict a *rise* in the price level and inflation, which is counterfactual). The problem is in identifying such a shock in a convincing way. The current crisis had its roots in the financial system. A breakdown in the financial system certainly has an adverse effect on productivity. However, according to the market-clearing approach, productivity is *exogenous*, i.e., it doesn't *respond* to the economy, it *drives* the economy. Another possibility according to the market-clearing approach is that the current recession reflects anticipated *future* declines in productivity. Again, although we are likely to see future declines in productivity in *response* to the crisis, it's doubtful whether such expectations were were the initial *cause* of the current recession.

   According to the market-clearing approach, business cycles reflect the economy's optimal response to fluctuations in the economy's capacity to produce output. Although expansionary fiscal policy (particularly in the form of government spending, rather than tax cuts) could offset the output drop arising from productivity decline, such a policy would be misguided. For example, an increase in government spending would only increase output because it makes people feel less wealthy, so they work harder. This would increase output, but not utility. In sum, most advocates of the market-clearing approach would likely argue against most of the recent proposals to increase government spending. (They would likely favor tax cuts, but not for countercyclical stabilization reasons).

2. The market-clearing approach provides a more convicing account of the so-called 'dot-com boom' of the 1990s. In this case, there was an identifiable, and arguably exogenous, change in productivity, stemming from the development and diffusion of information technology. Many observers have drawn connections between this period and the 'electricity revolution' of the 1920s, when there was also an economic boom. For example, figure 9.24 in the text depicts the economy's response to an anticipated *future* increase in productivity. The Y^d curve shifts out, both because investment increases and because consumption increases due to higher expected future incomes. The higher market

clearing interest rate then induces and outward shift in the N^s curve in the labor market, which puts downward pressure on real wages. In addition, if the effect of higher output on money demand dominates the effect of higher interest rates, so that on net money demand increases, then expectations of increased future productivity could also produce a decline in inflation. All of these effects occurred during the 1990s.

Unfortunately, expectations aren't always realized. If market participants were overly optimistic about the effects of information technology, then at some point all the effects listed above would run in reverse, as exectations of future productivity are revised *downwards*. Although output, consumption, labor supply and investment aren't likely to fall below their pre-boom levels, since z is not *lower* than before, they would fall relative to the boom of the late 1990s. The bursting of the dot-com 'bubble' could therefore have been a contributing factor to the economic slowdown during the period 2001-2002.

3. **(a)** Invention of a new computer chip presumably raises the MPK and encourages investment. By itself, this would shift out the IS curve. It could also increase full employment output, which would shift out the FE line. For simplicity, however, let's assume the FE line stays the same. Given this assumption, the short-run equilibrium moves from A to B, with higher output and interest rates. Assuming we started out at full employment output, the increase in output will eventually cause prices to rise. To avoid this inflation, the central bank should reduce the money supply so that the LM curve shifts back to LM_2.
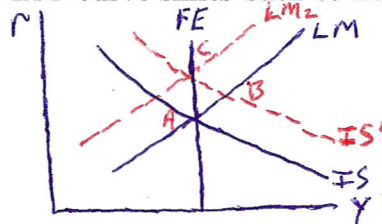

At the new long-run equilibrium, at point C, interest rates are higher and output is the same. If saving responds positively to the interest rate, then we know that at point C national saving has risen, and since Saving = Investment along the IS curve, we know that Investment is higher too, despite the higher interest rate. In this case, the higher MPK more than offsets the effect of higher interest rates.

(b) The reduced demand for money shifts out the LM curve to LM_2. The interest rate falls and output rises so that money demand rises back up to meet the given supply of money. The short-run equilibrium shifts to point B. Eventually, the higher output would lead to inflation (assuming again we started at full employment output). To avoid the resulting inflation, the central bank should simply reduce the money supply in line with the reduction in demand. This would then shift the LM curve back to its original position.


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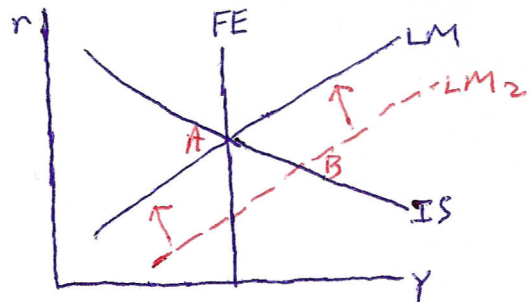
When the economy returns to its original long-run position at point A, consumption and investment fall back to their original levels.

(c) An increased saving rate represents a reduction in demand, which shifts the IS curve left. In the short-run, with prices fixed, output and the interest rate fall, and the economy moves to point B. Eventually, the price level would fall (assuming we started out at full employment output), and the LM curve would shift to the right. This could take awhile, however, so that the central bank may want to return the economy more quickly back to full employment output by increasing the money supply. This would also shift the LM curve to the right, with the new long-run equilibrium moving to point C.
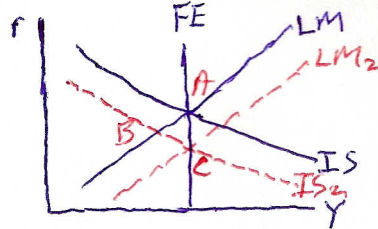

The lower interest rate at point C leads to higher investment (and therefore higher saving). Consequently, the direct effect on saving due to the new book more than offsets the negative effect on saving of the new lower interest rate.

4. To encourage investment, the central bank could increase the money supply. This would shift the LM curve to LM_2. The lower interest rate stimulates investment, which increases output. If we started at full employment output, this will eventually produce inflation. To avoid this, the government should cut spending or raise taxes. This would shift the IS curve to IS_2 and return the economy back to full employment output.
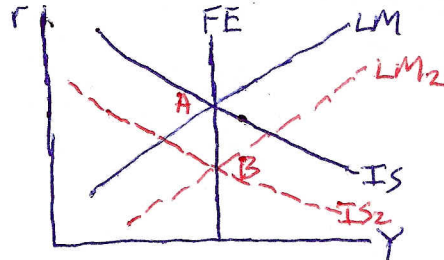
However, now the interest rate is lower and investment is higher. In effect, investment spending has replaced government spending (if G was reduced) or consumption (if T was increased).

5. A tight monetary policy shifts the LM to the left, and an increase in the budget deficit shifts the IS to the right. Short-run equilibrium shifts from point A to point B.
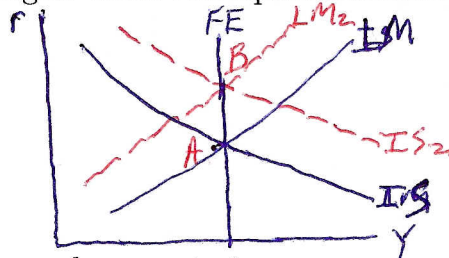
Interest rates (or the exchange rate in an open economy) are higher and investment (or net exports in an open economy) are lower.