

EC1010: Solutions to Sample Midterm

1.
 1. A
 2. D
 3. A
 4. A
 5. C
 6. E
 7. A
 8. B
 9. E
 10. C
 11. A
 12. D
 13. E
 14. B
2. a)
 - i. See Figure 1. The central difference to the Solow diagram is the savings curve. Because savings are zero below K' , the savings curve lies *on* the x -axis when the capital stock is below K' . Beyond K' , where the savings rate is s , we get the standard savings curve. (In the diagram, K' would lie just below the point where the savings curve is “cut.”)
 - ii. Below K' , savings and hence investment are zero, while depreciation is positive. Because depreciation exceeds investment, the capital stock falls towards zero, as does the level of output Y . As a result, the standard of living $\frac{Y}{L}$ also falls to zero. Because output Y is zero in the steady state, consumption is also zero (recall that $Y = C + I$).¹

¹If we start above K' , savings (and hence investment) exceeds depreciation, and we go to a steady state level of capital, marked by the dotted arrow.

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- b) i. Note that the investment rate $\frac{I}{Y}$ equals the savings rate $\frac{S}{Y}$. Because the investment rate was generally increasing, the steady state of the economy was rising (think of the savings curve rising upwards.) The Solow model predicts that output growth was positive in the economy over this period, as the economy continually headed to higher steady states.
- ii. We cannot say. Although the savings increase was relatively low in the U.S., if the U.S. was relatively poor, the rise in capital associated with this moderate increase in savings would have yielded large output gains (because the marginal product of capital is higher in a poorer country.) If South Korea started richer, the increase in savings in South Korea might have only led to a small change in output, even though the change in the investment rate was in fact higher.
3. a) i. See Figure 2.
- ii. The rise in investment demand leads to a shift outwards in the investment curve, leading to a rise in the real interest rate. But because savers are now less responsive to changes in interest rates, they do not increase savings as much. So compared to the case where savings behaviour didn't change, we end up with a lower level of savings and investment in equilibrium (recall that savings always equals investment); investment is now I'' rather than I' . The interest rate now rises more; intuitively, the interest rate has to rise more to "choke off" the investment demand, since there's less savings (i.e. "supply") to meet it.
- b) i. The equation of exchange is $MV = PY$. From this, if V has fallen, and the central bank wishes to maintain a constant P , then it must raise M . (Because Y is always at potential, we can effectively treat it as a constant.) If the bank didn't raise M , the fall in V would lead to a fall in P .
- ii. From the quantity theory of money, we know that $\pi = g_m - g_Y$; that is, inflation equals money growth less output growth. In this economy, inflation is $\pi = g_m - g_Y = 5 - 3 = 2\%$. And if inflation is 2%, and the required real return is 4%, the nominal rate you will charge is $4 + 2 = 6\%$. Namely, if you charge a nominal rate of 6%, this will yield a *real* return of $6 - 2 = 4\%$, as required.

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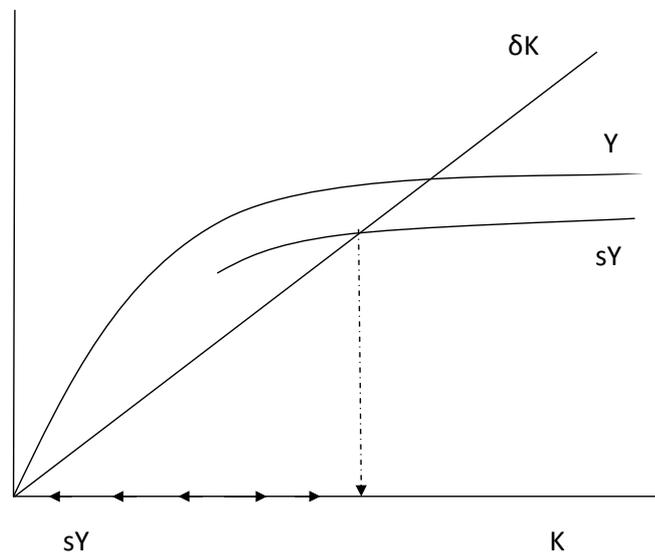


Figure 1: DIFFERENT SAVINGS RATES AT DIFFERENT LEVELS OF DEVELOPMENT

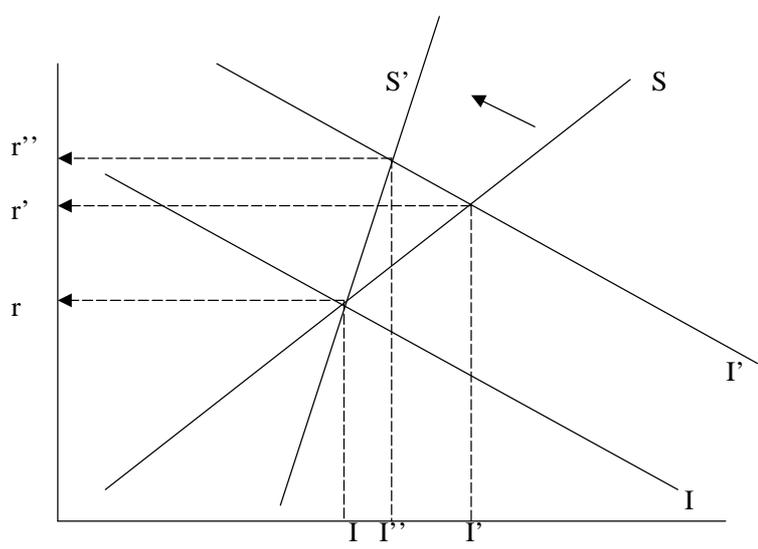


Figure 2: INCREASE IN INVESTMENT DEMAND AND A MORE INELASTIC SAVINGS CURVE