

Final Exam Solutions
Economics 101 - Fall 2007

Multiple Choice

Versions A, C: 1) a 2) b 3) c 4) b 5) d 6) a 7) c 8) d 9) c 10) d
 Versions B, D: 1) c 2) b 3) d 4) a 5) b 6) c 7) d 8) a 9) d 10) c

Problem 1: Neoclassical Model

a) $Y^s = 10 \times 100^{1/2} \times 100^{1/2} = 10 \times 100$ $Y = 1000$.
 $Y^d = C + I + G = [100 + 0.5(1000-200)] + [400 - 1000r] + 200$
 setting $Y^s = Y^d$: $1000 = 1100 - 1000r$
 so $-100 = -1000r$ so $r = 0.10$ or 10%
 Real wage = MPL = $5(K/L)^{-1/2} = 5(100/100)^{-1/2}$ $W/P = 5$
 $M*5 = P*Y$, so $P = M*5/Y = 400*5/1000$ $P = 2$
 Nominal GDP = $P * Y = 2*1000$ $= 2000$
 Nominal wage = $W/P * P = 5 * 2$ $= 10$

The key equilibrium condition in the goods/financial are supply of goods equals demand ($Y = C+I+G$) or Saving = investment. The interest rate adjusts so that the demand for loanable funds (for investment) in the financial market equals the supply (saving).

- b) A fall in M will cause P to fall, real GDP not to change, nominal wage to fall. Versions A,C: (b,c,b); versions B,D: (a,c,a)
- c) A rise in labor causes a rise in real output and a fall the real interest rate needed to clear the goods market. The MPL falls and hence so does the real wage rate. Price falls. Nominal wage is $P*MPL$, so this falls also.
 Versions A,C: (a,b,b,b,b); Versions B,D: (b,a,a,a,a)
- d) The classical dichotomy says that changes in nominal variables do not affect real variables, but only other nominal variables (like price level, nominal GDP, nominal rental rate). This is true above. In part b, the change in money supply only affects nominal variables. Note that section c does not violate this property: although this section shows that a change in real variables is affecting nominal variables, effects going from real to nominal are consistent with the classical dichotomy. It just rules out effects going the one direction, from nominal to real.
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Problem 2: Growth:

a) Steady state condition: $s f(k) = (\delta+n)k$, $s 6k^{1/2} = (\delta+n)k$, $k^{1/2} = 6s / (\delta+n)$,
 so $k^* = (6s / (\delta+n))^2 = (6*0.15 / (0.20+0.10))^2 = (3)^2 = 9$.
 So $y^* = 6k^{*1/2} = 18$

b) golden rule condition:
 $MPK = \delta+n$

$$3k^{*-1/2} = 0.30$$

$$k^{*-1/2} = 0.10$$

$$k^{*1/2} = 10$$

$$k^{*\text{gold}} = 100$$

put into the steady state condition:

$$s f(k) = (\delta+n)k \quad \text{so}$$

$$s = (\delta+n)k/f(k^*) = (0.20 + 0.10)k^* / (6k^{*1/2}) = (0.3/6) k^{*1/2} = (0.3/6) 10 = \underline{0.5}$$

compute consumption: $c = (1-s^{\text{gold}})y^{*\text{gold}} = (1-0.5) f(k^{*\text{gold}}) = 0.5(6*10) = \underline{30}$.

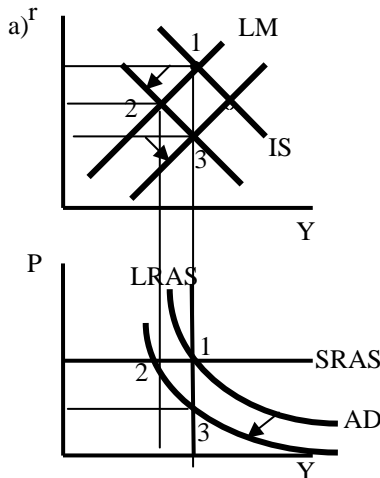
A higher capital stock would require too much investment to maintain and would lower the output available for consumption; a lower capital stock would lower the amount of output and thereby consumption.

- c) With a higher population growth rate: y^* falls, c^* falls, no effect on steady state growth in person terms (still at 0), rise in steady state growth in total output

Versions A,C: (b,b,c,a)

Versions B,D: (a,a,c,b)

Problem 3: Short Run and Long Run



The fall in consumption lowers total expenditure and output for a given level of interest rate and price level. This is a leftward shift in the IS curve² and AD curve. In the long run, the price falls and raises the real money supply. This requires a rise in Y or a fall in r to maintain equilibrium in the money market. This is a rightward shift in the LM curve

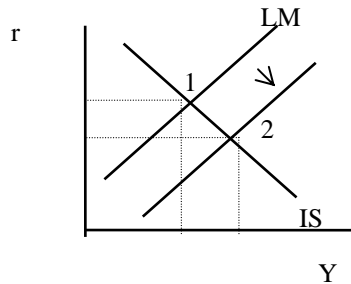
- b) Short run: Y falls, r falls, C falls, I rises, private saving falls
 Versions A,C: (b,b,b,a,b); Versions B,D: (a,a,a,b,a)

- c) Long run: Y at initial level, r lower, C lower, I higher, P lower,
 Versions A,C: (a,c,c,b,c); Versions B,D: (a,b,b,c,b)

- d) If consumers need loans to buy consumption goods like cars, a rise in the interest rate could discourage such consumption expenditure. This would mean that as interest rates fall to boost investment in the long run, consumption would also be boosted. Since the tax rise works through lowering consumption, this means that all the variables on the list move by less.

Problem 4: IS/LM

a)



A rise in money supply will force the interest rate down to maintain equilibrium in the money market – to raise money demand to equal the higher money supply. A fall in r for a given Y is a downward or rightward shift in the LM curve

- b) Y rises, r falls, C rises, I rises, real money demand rises. Versions A,C: (a,b,a,a,a); Versions B,D: (b,a,b,b,b)
- c) The IS curve becomes flatter, with no effect on the shape of the LM curve. So output rises more and interest rate falls less. Investment must rise more, or else output could not rise more. Versions A,C: (b,c,a,b,a); Versions B,D: (a,c,b,a,b)

Problem 5: IS/LM

With interest rates rising, it must be a leftward LM shift. Only the fall in money supply on this list would do this.

A,C: (bbbba); Versions B,D: (aaaab)