

DIPLOMA INDUCTION: MACROECONOMICS

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Q1: Suppose k, n and h grow at constant rates given by g_k , g_n and g_h . What is the growth rate of y in each of the following:

- (i) $y = k^{1/3}$
- (ii) $y = k^{1/3}n^{2/3}$
- (iii) $y = hk^{1/3}n^{2/3}$
- (iv) $y = hk^{1/4}n^{3/4}$
- (v) $y = hk^{3/4}n^{1/4}$
- (vi) $y = (knh)^{1/2}$
- (vii) $y = (kn)^{1/4}(1/h)^{3/4}$

Q2: Suppose the economy exhibits a large, unexpected increase in productivity growth that lasts for a decade. Policy makers misunderstand what has happened to potential output and incorrectly interpret the increase in output as a boom that leads actual output to exceed potential. Suppose they adjust macroeconomic policy so that the mis-measured output gap is zero.

- (a) What happens to the true amount of output gap?
- (b) Can you describe possible effects on unemployment?

Q3: Consider the table below, showing hypothetical measures of real GDP in the coming years, starting at a level of £18 trillion in 2014. Fill in the remaining columns of the table by answering the following questions:

Year	Actual Output, Y_t	Potential Output, \bar{Y}_t	Output gap, x_t	Growth rate of actual output
2014	18.00			
2015	18.20			
2016	18.50			
2017	19.50			
2018	20.00			

- (a) After some research using business surveys, unemployment reports, and recent years' experience, an economist suggests that the economy is operating at potential output in 2014. Assuming that potential output grows at a constant annual rate of 2.5% complete the remainder of the table.
- (b) Briefly comment on the state of the economy in each year.
- (c) Based on your comments, what do you think happens to the rate of unemployment between 2014-2018?

Q4: Despite the inflationary pressures that the UK economy faces (arising from the sterling's drop since the Brexit vote, high oil prices, and some pressure on food prices), on the 2 Feb 2017, the Bank of England's rate-setting Monetary Policy Committee (MPC) voted unanimously to keep interest rates at the historically low rate 0.25%. How can you explain this decision by the MPC?

Q5: Explain what is meant by the Central bank's loss function. How are central banks' preferences reflected in the loss function?

Q6:

- (a) Using the loss function: $L = (y_1 - y_e)^2 + \beta(\pi_1 - \pi^T)^2$, draw this function for the cases where:
 - (i) $\beta = 1$
 - (ii) $\beta < 1$
 - (iii) $\beta > 1$
- (b) In which of the three cases above will the central bank reduce inflation back to the target quickest after an inflation shock? Is there any downside to adopting this policy stance?

Q7: Consider the following economy in order to answer the following questions:

$$C = 700 - 400i + 0.75(Y - T)$$

$$T = 10 + 0.2Y$$

$$I = 200 - 100i$$

$$G = 300$$

$$\frac{M_2}{P} = 600$$

$$\left(\frac{M}{P}\right)^D = 0.25Y - 125i$$

- (a) What is the value of the multiplier of the autonomous spending?
- (b) As taxes depend on income, what does this mean for the size of the effect of an increase in autonomous spending on income?
- (c) Find the equation for the IS and LM curve in this economy.
- (d) Calculate the interest rate and the income in equilibrium.
- (e) Suppose that the central bank decides to adopt an expansionary monetary policy and increases the money supply by 10%. What will be the effects on the interest rate and income in the economy?

Q8: Use the 3-equation model to answer the following:

- (a) Assume the economy is initially at equilibrium and there is a positive shock to aggregate demand from improved consumer confidence. Discuss whether contractionary fiscal policy should be used in this situation.

- (b) Now assume that the economy is initially at equilibrium but there is a negative shock to aggregate demand. How do the central bank would react to this shock? Explain in detail under which circumstances fiscal policy would be effective in stabilising the economy.

Q9: Consider a Central Bank that sets interest rate to keep inflation under control following a monetary rule. Using the IS/MP framework, answer the following:

- What would be the effect of an negative temporary demand shock on the real interest rate and output in the short-run? What is the reaction of the Central Bank?
- Assume now that the demand shock is large and permanent and that the Central Bank cannot set the interest rate indicated by the monetary rule. Explain this situations and the possible alternatives for the central bank.

Q10: Consider an economy with banks. The demand for money is given by: $M_d = P(Y - 500i)$. Consumers want to hold 50% of this as currency $c = 0.5$ and 50% as deposits $(1 - c) = 0.5$. Banks want to hold 40% as reserves $\emptyset = 0.4$.

- The equation of the demand for Central Bank money (H_d) can be written as $H_d = R + CU$ where R is the bank's demand for reserves and CU is the consumer's demand for currency. Write out an equation for Central Bank money demand (H_d) as a function of money demand (M_d).
- What is the money multiplier? Explain and solve.
- Assume the price level is 1 ($P = 1$), real income is £950 ($Y = 950$), and the supply of Central Bank money is £630 ($H = 630$). Solve for the equilibrium interest rate.
- If the supply of Central Bank money decreases to £595, what will be the change in the interest rate? Explain and solve.