MOT1421
Economic Foundations
Week Five

MACROECONOMICS:
INTRODUCTION & NEOCLASSICAL MODEL
SELF-TEST: ANSWERS

The self-assessment consists of 10 Questions.
Each Question has a weight of 1. Your maximum score therefore is 10.
A score of 6 means that you have successfully passed the test.
This self-test is self-scoring.

Question 1

The answers are:

a. $\hat{y} = \left(\left[\frac{1192.4}{173.1} \right]^{\frac{1}{59}} - 1 \right) \times 100\% = 3.32\%.$ This is the average annual compound rate of growth of Spanish real GDP during 1960-2019 (in two decimals).

b. $\hat{y} = \left(\left[\frac{239.7}{85.3} \right]^{\frac{1}{38}} - 1 \right) \times 100\% = 2.76\%.$ This is the average annual compound rate of growth of Greek real GDP during 1970-2008 (in two decimals).

c. $\hat{y} = \left(\left[\frac{14574}{1273} \right]^{\frac{1}{146}} - 1 \right) \times 100\% = 1.68\%.$ This is the average annual compound rate of growth of real GDP per world citizen during 1870-2016 (in two decimals).

Question 2

a. The rate of inflation = 4% – 3.2% = 0.8%.
b. The growth rate of nominal GDP = 2.1% + 1.4% = 3.5%.
c. The real rate of interest rate = 5% – 3.5% = 1.5%.

d. The growth of real wages = 1.2% – 2.1% = –0.9%. Yes, real wage growth can be negative.

Question 3

Fiscal policy is the means by which a government adjusts its spending levels (public current expenditure and/or public investment) and tax rates in order to influence the level of activity in a nation's economy. The level of economic activity is expressed by the level of GDP.

- Instrument 1: public investment. Higher public investment will raise aggregate demand; this will increase GDP and reduce unemployment; if there is not enough excess capacity in the economy, higher public investment may lead to higher inflation.
- Instrument 2: income taxes. Higher income taxes reduce aggregate demand; this will lower GDP and increase unemployment. Because aggregate demand declines and demand pressure in the economy is reduced, higher income taxes are likely to lead to lower inflation.

Question 4

Monetary policy by the central bank attempts to influence inflation and GDP. Central banks have (in theory) two instruments of monetary policy:

- the interest rate: the central bank can increase the interest rate to reduce demand (especially investment by firms); if investment goes down, real GDP will go down; unemployment will go up; and inflation will come down.
- Money supply: in some theories, it is assumed that central banks can control money supply in a direct manner, and through this, they can influence inflation if the central bank reduces money supply. Changes in money supply do not have lasting impacts on GDP and on unemployment (in these theories).

Question 5

Gross Domestic Product is the sum of all value added earned in one year in all industries in the economy. Value added, in turn, is the difference between gross

output and intermediate input costs. This is how GDP is measured as income generated by the production process.

Gross Domestic Product can also be measured on the demand side, as it is equal to total final demand in the economy. Total final demand is the demand for finished goods and services by consumers, government, firms (business investment) and by the rest of the world (= exports minus imports).

The two measurements yield the same level of GDP – because they are derived from a consistent input-output table.

Question 6

Calculate the equilibrium real interest rate and equilibrium loanable funds supply and demand. In equilibrium, $LF^S = LF^D$. Hence, we get: $95 + 0.25\,r = 100 - r \rightarrow \frac{5}{4}r = 5 \rightarrow r = 4\%.\ LF^S = LF^D = 96.$

Question 7

Keynes argued that the LF^S-curve and the LF^D-curve are not independent: if one curve shifts, the other curve must shift as well. Explain Keynes' argument.

Keynes pointed out – correctly – that savings and investment do not just depend on the real interest rate, but also (and perhaps more strongly) on the level of income. The level of real income *y*, in turn, depends on investment: an exogenous rise in public investment or business investment will lead to an increase in real GDP and an increase in savings (households save a fixed proportion of their real incomes). In terms of the graph for the market of loanable funds, this would mean two changes. First, due to the exogenous increase in investment, the LF^D-curve will shift to the right. Second, because investment leads to higher real income and therefore higher savings, LF^S-curve will simultaneously shift to the right as well. According to Keynes, the two curves are inter-dependent – and there cannot be a shift in either the LF^S-curve or the LF^D-curve alone.

Question 8

In the neoclassical macroeconomic model, fiscal stimulus leads to crowding out. This works as follows. To finance the higher public spending, the government has to borrow from the banks. The banks are fully-loaned up: they don't have spare cash to lend to the state. To mobilise additional savings from the public, the banks raise the interest rate. The public will increase savings, deposit these in the banks, and the banks can use these extra loanable funds to lend to the government. However, the higher interest rate has two further impacts. First, businesses will reduce their investment, because the cost of capital (= the interest rate) has gone up. Second, households will save more and reduce consumption. Aggregate demand will go up, due to higher public spending, but it will go down due to reduced business investment and reduced household consumption. The net effect on aggregate demand will be zero.

Higher public spending has therefore crowded out business investment and household consumption, via the higher interest rate.

Question 9

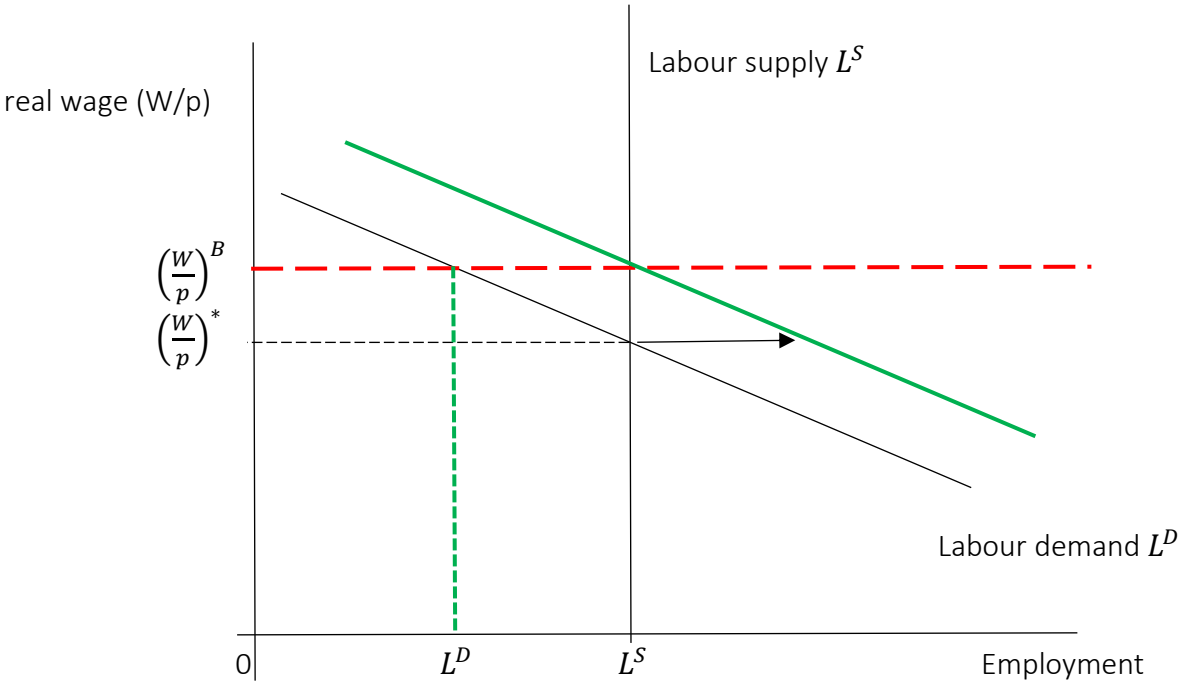
In the neoclassical macroeconomic model, monetary policy must follow a monetary policy rule. The aim of the monetary policy rule is to keep inflation stable and this is done by increasing/reducing the growth of money supply. The monetary policy rule is: $\widehat{M^S} = \hat{p} + \hat{y}$.

Let us suppose that the inflation target of the central bank is $\hat{p} = 2\%$. The central bank expects real GDP to grow by 1.1% in the next year. To keep inflation below 2%, the central bank should allow money supply to grow at:

$\widehat{M^S} = \hat{p} + \hat{y} = 2\% + 1.1\% = 3.1\%.$

Question 10

Consider the following Figure:



The Neoclassical Labour Market with Collective Wage Bargaining

a. The market-clearing equilibrium wage $\left(\frac{W}{p}\right)^*$ is lower than the bargained wage. Given $\left(\frac{W}{p}\right)^B$ labour supply is larger than labour demand; the difference between labour supply and labour demand is made up of unemployed workers.
b. The only way in which unemployment can be reduced in the neoclassical model, is by lowering the bargained wage $\left(\frac{W}{p}\right)^B$ to the level of the market-clearing equilibrium wage rate $\left(\frac{W}{p}\right)^*$.
c. If we assume that the macroeconomy is not operating at full capacity, the government could increase public spending. As a result, GDP would go up and labour demand would increase – see the green labour demand curve in the figure. This way, by means of expansionary fiscal policy, it is possible to reduce unemployment, while maintaining the bargained wage rate $\left(\frac{W}{p}\right)^B$.

End of self-test Week 5