Week Three

EPA143A

KEYNESIAN MACROECONOMICS

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ANSWERS

EXERCISE W-3.1:

1. $y = [\frac{1}{1-mpc+\mu}] \times (\, c_0 - mpc \times \tau + \bar{g} + i_0 - \rho \times r + \bar{e} - \, m_0)$

2. The multiplier = $[\frac{1}{1-mpc+\mu}]$. It is the derivative of *y* with respect to autonomous demand $a = (\, c_0 - mpc \times \tau + \bar{g} + i_0 - \rho \times r + \bar{e} - \, m_0)$, $\frac{\Delta y}{\Delta a}$.

3. The multiplier for *g* is: $\frac{\Delta y}{\Delta g} = \left[\frac{1}{1-mpc+\mu}\right] > 1$ if we assume that $mpc > \mu$. (If $mpc < \mu$ this multiplier will be < 1.

   The multiplier for *g* is: $\frac{\Delta y}{\Delta \tau} = \left[\frac{-mpc}{1-mpc+\mu}\right] < 0$.

4. The <u>balanced-budget multiplier</u> = $\frac{\Delta y}{\Delta g} + \frac{\Delta y}{\Delta \tau} = \left[\frac{1-mpc}{1-mpc+\mu}\right] > 0$. This is important. What it means is that if the government increases expenditure by 1 euro and at the same time raises income taxation by 1 euro (*i.e.* the government budget remains in balance), then this will create additional GDP. Government can raise real GDP without the need to run a budget deficit.

5. $y = [\frac{1}{1-0.75+0.25}] \times (\, 200 - 0.75 \times 400 + 150 + 100 - 5 \times 4 + 400 \, - \, 50 \, = \, 960$ billion euros.

   The multiplier = 2. The balanced-budget multiplier = 0.5.

6. If real exports increase by 25% (or 100 units), then real GDP will increase by 2 x 100 = 200 billion euros. Consumption was 620 billion euros (when *y* = 960 billion euros). Consumption becomes euro 770 billion. The trade balance was equal to *e* – *m* = 400 –

(50 + 0.25 x 960) = euro 110 billion (a surplus). The trade balance increases to: $e - m$ = 500 – (50 + 0.25 x 1160) = euro 160 billion (a bigger surplus).

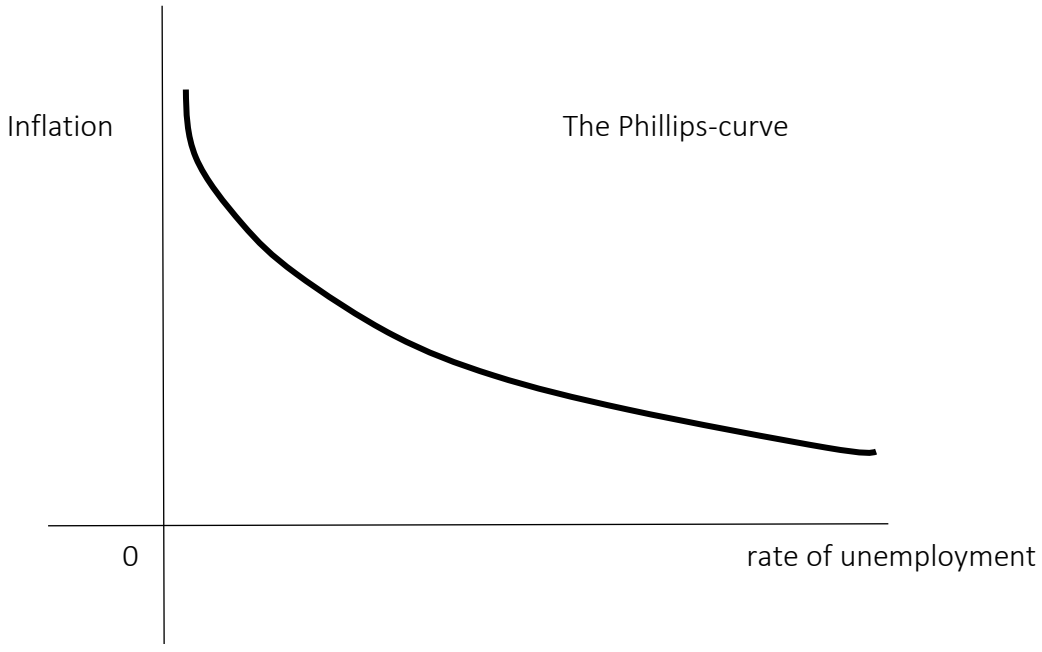
7. $\frac{\Delta y}{\Delta r}\left[\frac{-5}{1-0.75+0.25}\right] \times 1 = -10$. The higher interest rate reduces (private) investment and hence real GDP declines – by euro 10 billion.

EXERCISE W-3.2:

1. The multiplier = 2; hence, $\Delta y = 2 \times \Delta g = 2 \times 20 = 40$ billion euros. Real GDP increases by 40 billion euros to y = euro 1 trillion. L^D becomes 20 million workers; unemployment declines to 0.645 million workers; the unemployment rate declines from 7% (before the fiscal stimulus) to 3.1%.

2. It is likely that the nominal wage and therefore the real wage will increase – due to the fact that the excess supply of labour has decreased.

3. If the higher nominal wage leads to higher prices, inflation will increase. This relationship between the unemployment rate and inflation is known as the Phillips-curve.



EXERCISE W-3.3:

Mr. Krugman is arguing against the notion that fiscal austerity (the opposite of fiscal stimulus) could be expansionary (= leading to growth of real GDP). In Krugman's view, the fiscal multiplier $\frac{\Delta y}{\Delta g} = \left[\frac{1}{1-mpc+\mu}\right] > 1$; therefore, if $\Delta g < 0 \rightarrow \Delta y < 0$. Fiscal austerity will reduce real GDP, economic activity and create additional unemployment. The French government failed to see this, and by adopting fiscal austerity, they have reduced French GDP.

EXERCISE W-3.4:

	The economy moves into:	
	recession	upswing of the business cycle
defense spending	no change	no change
unemployment compensation	increases, raising *d*	declines, reducing *d*
public infrastructure investment	no change	no change
income taxation	declines, raising *d*	Increases, reducing *d*
wealth taxation	no change	no change
social security benefits	increases, raising *d*	declines, reducing *d*
spending on climate change mitigation	no change	no change

d = aggregate demand.

EXERCISE W-3.5

1. Fiscal consolidation is defined as concrete policies aimed at reducing government deficits and public debt accumulation. These consolidation plans and detailed measures are given as a per cent of nominal GDP. Fiscal consolidation will involve: (a) reductions in public spending (on public investment and government current expenditures including subsidies and wages and salaries of civil servants); (b) increases in public revenue (due to increases in taxation).

2. Italy had a primary government surplus of 3% of GDP in each year during 1995-2008. In terms of the debt-dynamics equation $\Delta debt = fiscal\ deficit + (i - g) \times debt$, a primary fiscal surplus is equivalent with a negative fiscal deficit of -3%. Thirteen years x -3% = -39%; accordingly, the persistent primary fiscal surplus lowered Italy's public-debt-to-GDP ratio by around 40% (when keeping all other factors such as *i* and *g* constant).

3. According to the Keynesian model, fiscal austerity may not work in reducing the public-debt-to-GDP ratio. This will be the case if the fiscal multiplier is larger than 1. In this case, a primary fiscal surplus of 3% (brought about mostly by reductions in public expenditure) will reduce GDP by more than 3%; let us assume that the fiscal multiplier is 1⅓, then GDP will decline by 4%. If the original debt-to-GDP ratio is (say) 120% (or 1.2), then in the debt-dynamics equation, we will get:

   $\Delta debt = -3\% + (i - -4\%) \times 1.2$. Hence, the debt-to-GDP ratio will increase – rather than decrease. Fiscal austerity backfired.

4. The reduction in real wage growth in Italy had three effects. First, it contributed to lower inflation. Wage growth raises ULC and hence prices. Lowering wage growth helps lowering ULC and this means that firms need to increase their prices less. Lower inflation can be a positive development; it allows the central bank to lower the interest rate which could (in principle) lead to higher business investment and higher growth. However, if lower wage growth reduces demand (because the economy is wage-led), then real GDP growth may not rise. Second, lower wage growth makes labour cheaper relative to machines; firms will hire more workers per unit of capital stock. Labour demand and employment increase; unemployment goes down – which is a positive macro-economic development. Third, cheaper labour makes it less urgent for firms to invest in new labour-saving technologies; less-productive firms can remain in business, because lower wage growth helps them to remain competitive; as a result of both factors, the growth of labour productivity will slow down. This is a negative macro development. What is important is that $ULC = \frac{w}{\lambda}$; wage growth is reduced, but (in response) labour productivity growth goes down as well. In consequence, ULC will not decline as much as was perhaps expected.

5. It follows from the definition that a higher rate of capacity utilization *u* will raise the profit rate. This is understandable, because the higher utilization means that firms are managing to generate more value added (income) from the same installed capital stock, by using capacity to a higher degree.

6. The key factor holding down the growth of the Italian economy is the lack of aggregate demand growth. Due to this structural 'demand insufficiency', capacity utilization in Italy is relatively low and this reduced the profit rate of economic activity. We must note that the profit share in Italy has increased over time, but the profit rate did not increase, but stayed constant and rather low. This can only be explained as a consequence of declining capacity utilization and declining demand growth. The structural causes of the structural demand deficiency are: (1) very low growth of real wages; declining real household incomes; (2) declining real public expenditure; fiscal austerity (the permanent primary fiscal surplus); and (3) poor export performance, partly due to the fact that the euro exchange rate is too high from the viewpoint of the Italian economy.

7. The crisis is called permanent, because the underlying causes are structural. The causes are not easy to remove and they are mutually reinforcing. Low real wage growth reduces domestic demand growth and makes the economy more reliant on exports; it also lowers tax revenue and forces additional cuts in public spending; firms need to diversify and upgrade their production processes, but for this they must invest; slow growth means that they are hesitant to do the necessary investments. The lack of an own currency and the fact that the Italian state has to keep to fiscal policy rules which belong to Eurozone-membership mean that the Italian government has hardly any macro-economic policy space to improve the situation.