

Macroeconomics

Solutions to the

Sample Mid-Term Test

November 2016

Vivaldo Mendes

Group A

- A1 - Four main concerns of the study of macroeconomics may be the following:
- Why unemployment is volatile. Why are we not capable of maintaining the unemployment rate at a relatively stable value over time?
 - Why are most western economies suffering from a level of deflation which is much lower than Central Banks want it to be? Why deflation in many economies around the developed world?
 - Why so much volatility in real GDP? Why are we not capable of keeping real GDP very close to its potential level over time?
 - Why do we have negative (nominal) interest rates in many countries? Is this not an almost "unnatural" event in economics?

A2

1. Parameters are (according to the textbook)
 \bar{a} , \bar{l} , \bar{f} and \bar{g} .

Another (more reasonable view) is to consider parameters as

$$\bar{a}, \bar{g}$$

and \bar{l} and \bar{f} as exogenous variables

(both answers would be correct)

2. Endogenous variables are:

$$L^s, L^d, w$$

3. The equilibrium of this model is obtained
by setting

$$L^d = L^s = L^*$$

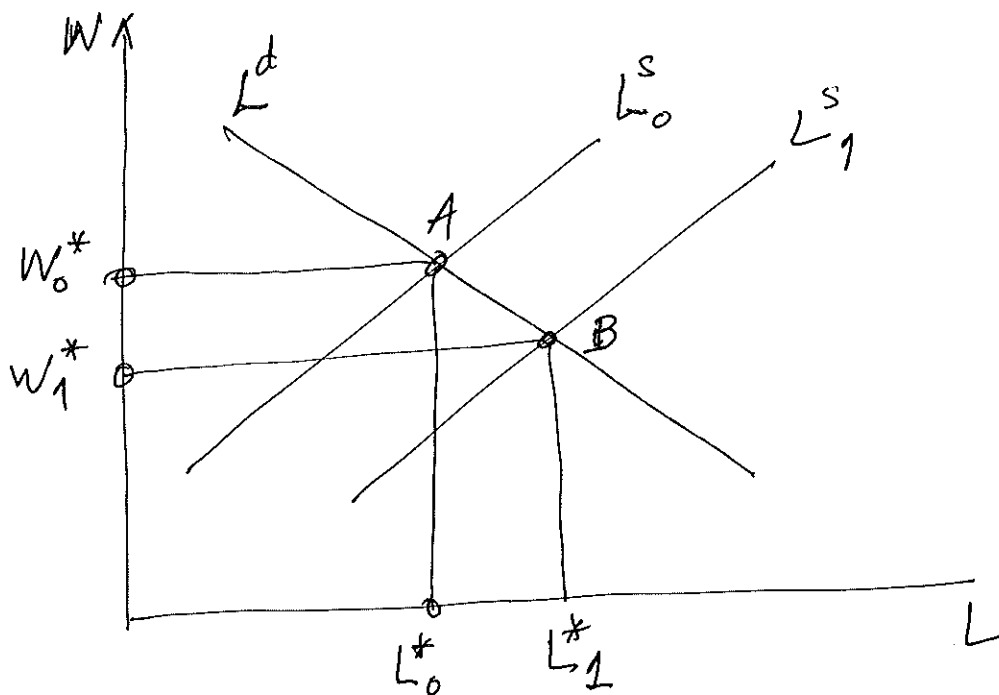
Therefore

$$\bar{a}w + \bar{l} = \bar{f} - \bar{g}w$$

from which we can obtain

$$w^* = \frac{\bar{f} - \bar{l}}{\bar{a} + \bar{g}} \quad \text{and} \quad L^* = \frac{\bar{a}(\bar{f} - \bar{l})}{\bar{a} + \bar{g}} + \bar{l}$$

4. If \bar{l} increases, then the new equilibrium will be at point B below



Group B

1. Nominal GDP is Prices x Quantities in each year:

$$\text{Nominal GDP}_{2017} = 100 \times 5 + 5 \times 100 = 1000$$

$$\text{Nominal GDP}_{2018} = 105 \times 5 + 3 \times 105 = 840$$

The growth rate of nominal GDP between 2017 and 2018 is

$$g_{\text{nominal}} = \frac{840 - 1000}{1000} = -16\%$$

2 By applying the formulas, we get

$$P_{2018}^Z = \frac{(100 \times 5) + (5 \times 105)}{(100 \times 5) + (5 \times 100)} = 1.025$$

$$P_{2018}^P = \frac{(105 \times 5) + (3 \times 105)}{(105 \times 5) + (3 \times 100)} = 1.018$$

$$P_{2018}^F = \sqrt{1.025 \times 1.018} = 1.021$$

Therefore, Real GDP will be given by

$$\text{Real GDP}_{2018} (\text{L}) = \frac{840}{1.025} = 819.5$$

$$\text{Real GDP}_{2018} (\text{P}) = \frac{840}{1.018} = 825.1$$

$$\text{Real GDP}_{2018} (\text{F}) = \frac{840}{1.021} = 822.2$$

3. The growth rates of Real GDP, according to each Price Deflator will be

$$g_{\text{Real GDP}} (\text{Laspey}) = \frac{819.5 - 1000}{1000} = -18\%$$

$$g_{\text{Real GDP}} (\text{Paasche}) = \frac{825 - 1000}{1000} = -17.5\%$$

$$g_{\text{Real GDP}} (\text{Fisher}) = \frac{822.2 - 1000}{1000} = -17.7\%$$

4 Base year price indices show two major limitations:

- the base year has to be updated from time to time, because it makes no sense to be measuring real GDP with prices from one hundred years ago (for example).
- Updating the base leads to the fact that the history of the economy changes every time the base is updated, which makes no sense.

Group C

C1. Definition. Real convergence across countries means that Real GDP per capita of the poor countries has to grow faster than those of the rich countries, such that at one point in time ~~they~~ ^{both} will converge to the same level.

The evidence that is presented in that figure of chapter 3 does not favour the existence of convergence. Convergence would require a negative relationship between the growth rate of real GDP per capita and its initial level. However, the figure displays very clearly a positive relationship between those two variables.

C2

Expressing growth rates by small letter, we will have

$$(a) \quad y_t = a_t + 0.4 k_t + 0.6 l_t$$

$$(b) \quad z_t = \alpha k_t - \alpha l_t$$

$$(c) \quad x_t = \alpha k_t + \alpha l_t$$

Group D

D1

1. The dashed line represents natural unemployment. This kind of unemployment incorporates two types of unemployment:

- Frictional : unemployed people that are moving from one job to another one.
- Structural : people that are unemployed for long periods of time due to a mismatch between their ~~skills~~ skills and those that are demanded by the market.

2. The figure shows very clearly that we can conclude the following:

- Period 1985-1991 : we have an economic expansion because cyclical unemployment is negative, that is, actual unemployment rate is below the natural rate of unem-

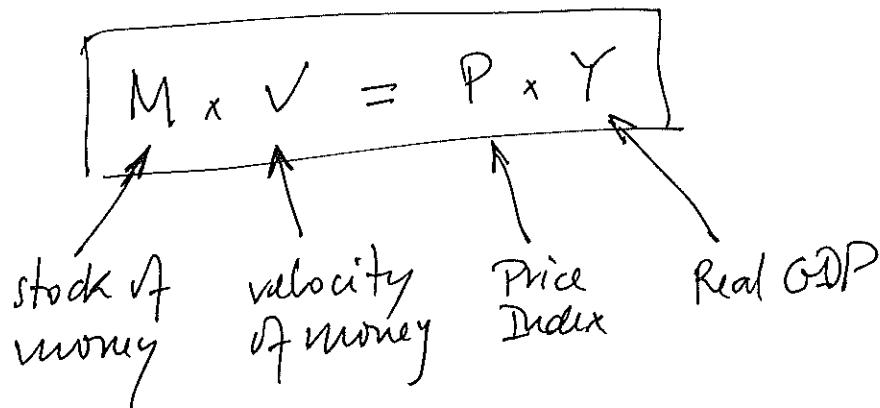
ployment.

- Period 2007-2010: we have an economic recession because, firstly, the actual unemployment rate starts to increase very rapidly and then it goes over the level of the natural rate of unemployment.

3. Our prediction should be that both rates will come down. Considering that actual unemployment started to come down somewhat in 2010, this fact will produce an impact upon the natural rate to come down as well in the future.

D2

The Quantity Theory of Money tells me that



This theory assumes that M , V and Y are exogenously determined and, therefore, prices will increase if the Central Bank decides to increase the stock of money.

In terms of growth rates we have

$$g_M + g_V = g_P + g_Y$$

The figure 8.3 clearly supports the QTM, because at the international level there is a very clear positive relationship between

g_m and g_p . those countries that display higher g_m are also those that show higher g_p .

D3

The Okun's Law stipulates that cyclical unemployment ($u_t - \bar{u}$) is negatively related to short run output (\tilde{Y}_t), with a slope close to $-(1/2)$. That is

$$u_t - \bar{u} = -(1/2) \tilde{Y}_t$$

the figure in the test supports very clearly the Okun's law because the slope is negative and equal to $-(1/2)$.