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## Introductory Macroeconomics

### Homework 4: Classical vs. Keynesian Views of Output and Employment

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Javier Tasso

1. T/F. In the classical model, prices and wages are fully flexible in the short run.
2. T/F. According to the classical model, output is determined by aggregate demand.
3. T/F. The Keynesian view assumes that wages adjust instantly to clear the labor market.
4. T/F. In the classical model, changes in the money supply affect nominal but not real variables.
5. T/F. In the Keynesian view, a fall in aggregate demand can lead to a prolonged recession.
6. The classical model. Consider an imaginary economy where:
  - The labor market is perfect and characterized by  $L_D = 120 - w$  and  $L_S = \frac{4}{3}w - 20$ , where  $w = \frac{W}{P}$  is the real wage.
  - The production function in the short run is  $Y = 120L - \frac{L^2}{2}$ .
  - The quantity equation is  $MV = PY$  where  $V = 100$  and  $M = 270$ .

Please answer:

- (a) Find the equilibrium in the labor market. Your answer should include the real wage and the amount of workers.
  - (b) Find the full employment output.
  - (c) Graph the production function and the labor market. The two graphs should be stacked vertically and be sure to label your answers of parts (a) and (b).
  - (d) Find the value of the price level  $P$  and the nominal wage  $W$ .
  - (e) Graph the aggregate supply and the aggregate demand.<sup>1</sup> Label your answer of part (d) in the graph.
7. Continue working with the economy of the previous exercise.
- (a) Assume that there's an increase in money supply  $M' = 540$ . Find the new equilibrium. Your answer should include:  $P$ ,  $Y$ ,  $L$ ,  $W$ ,  $w$ . Graph this situation. Your answer should include three graphs: labor market, production function, and aggregate supply and aggregate demand. Be sure to highlight which lines shift.
  - (b) Disregard any change of part (a). Instead, assume there's an increase in the stock of capital. The new production function is  $Y = 155L - \frac{L^2}{2}$ . The new labor demand is  $L_D = 155 - w$ . Repeat (a).

Please illustrate (a) and (b) in separate plots.

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<sup>1</sup>Derive the aggregate demand curve from the quantitative equation.

8. Keynesian output determination. Consider an imaginary closed economy with no government where the basic macroeconomic equation is  $Y = C + I$ . Investment is given  $I = 90$  and consumption depends on income  $C = 10 + 0.8Y$ .
  - (a) Find the equilibrium levels of output, consumption and saving.
  - (b) Plot the expenditure along with the 45 degree line. The horizontal axis should be output and the vertical axis expenditure.
  - (c) Assume  $I = 110$ , repeat (a) and add this situation to your plot of part (b). What's the spending multiplier?
  - (d) Now assume that people decide to save more and consume less, so the new consumption function is  $C = 10 + 0.5Y$ . Repeat (a) and (b).
  - (e) Briefly explain the paradox of thrift.
9. The Fisher effect. Answer briefly. You may want to read chapter 31 of Mankiw's textbook or any other source of your choice.
  - (a) Who was Irving Fisher?
  - (b) State the Fisher equation.
  - (c) State the Fisher effect.
  - (d) An anticipated increase in inflation will not have real effect on borrowers. Explain why.
  - (e) What are the main real forces that determine the real interest rate?
10. Briefly explain why in the classical model there's no point in doing fiscal policy. Why is this different under the Keynesian view?
- 11-15. Focus on the nominal interest rate as measured by the three month treasury bill rates (DTB3) and inflation according to the CPI (CPIAUCSL) from [FRED](#). The goal of this exercise is to find two ways of visualizing the Fisher effect.
  - (a) Use annual data since 1960. For the CPI, use percent change from year ago to get a measure of inflation.
  - (b) Plot the two lines on the same graph, make sure the lines are correctly labeled.
  - (c) Download the data you used to make the previous graph.
  - (d) Make the scatterplot between the two variables, with inflation in the horizontal axis and the nominal interest rate in the vertical axis. Make sure to label the axis.
  - (e) Add the 45 degree line to your scatterplot.

Your answer to this question should include two graphs. One of the evolution over time. And one scatterplot. Good references for this are: Figure 5 of chapter 31 in Mankiw's *Principles of Economics* and Figure 12.1 of Williamson's *Macroeconomics*.