

Universitat de Barcelona
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Macroeconomics - Group A8
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**Basic models of the determination of national income.
Short and long run.**

**List 4 - Keynesian cross model, output gap, and
unemployment.**

1. Consider an open economy with public sector. Consumption is $C = 1500 + 0.75Y_d$, investment is $I = 2000$, public spending is $G = 1000$, taxes are $T = 0.3Y$, transfers are $TR = 1000$, exports are $X = 750$, and imports are $M = 0.15Y$, where Y is income and $Y_d \equiv Y - T + TR$ is disposable income.
 - (a) Compute the equilibrium level of income.
 - (b) Determine the multiplier of this economy and use it to compute the effect of an increase in exports by 100 units on the equilibrium level of income.
 - (c) Given the initial situation, what would be the output gap if the production of full employment is $Y_n = 10000$. Give an example of a policy that would bring the economy to full employment, that is, specify which exogenous variable we should increase in order to reach $Y = Y_n$ and the magnitude of the necessary increase.
2. An economy is characterized by $C_0 = 100$, $c = 0.7$, $t = 0.3$, $m = 0.15$, $I = 3000$, $G = 4000$, and $X = 2000$.
 - (a) Determine the government spending multiplier and explain its economic meaning.
 - (b) Compute the equilibrium level of income, consumption, private savings, public savings, and net exports. Identify graphically each of these quantities.
 - (c) If the productivity of labor is constant and equal to 3, then $Y = 3 * E$. Compute the actual employment level. If the labor force $\bar{L} = U + E$ is 5500, determine the full employment level of output, that is, $\bar{Y} = 3 * \bar{L}$. Compute the gap between potential output \bar{Y} with full employment and actual output Y at equilibrium.

- (d) How much must government spending increase in order to reach the output level with full employment? What are the effects of such a policy on the income level, on the public savings, and on the net exports?
- (e) Suppose that now the government adopts an alternative policy, that is, create a system of direct transfers to the households of the economy. Suppose that the amount of transfers TR is exactly equal to the increase in government spending necessary to reach full employment. Does the government reach its full-employment target? Compare the two policies and explain their differences, if there is any.
3. Consider an open economy with public sector characterized by the following features: $C_0 = 200$, $c = 0.75$, $t = 0.25$, $m = 0.2$, $I = 3000$, $G = 4500$, $X = 3300$, $Tr = 500$, with the productivity of labor $\gamma = 4$ and the labor force $L = 6000$.
- (a) Determine the equilibrium level of income, the employment, the unemployment rate, the consumption, the private and public savings, and the net exports.
- (b) Suppose that the government decides to readjust the public budget by eliminating completely the transfers Tr . Determine the effect of this policy on the equilibrium level of income, the employment, and the public savings.
- (c) If this policy is accompanied by a drop in exports by 300 units, what is the overall effect on the equilibrium level of income and on the employment?
- (d) Suppose now that the government plans to reach full employment. How much such the income increase in order to reach the government's target? If the government wants to reach the target by increasing public spending, how much should the latter increase?
4. Consider an open economy with public sector. The labor force is $L = 5800$ and the labor productivity $\gamma = 3$. Moreover, the specifics of this economy are $C_0 = 500$, $c = 0.75$, $m = 0.25$, $I = 2900$, $X = 3000$, $t = 0.3$, and $G = 4200$.
- (a) Determine the equilibrium level of income, the employment, the unemployment rate, the consumption, the private and public savings, and the net exports.
- (b) Suppose that a recession causes a drop in investment by $\Delta I = -500$. Determine the effect on income and employment.

- (c) Suppose now that on top of the drop in investment, the habits of consumers change in such a way that the new marginal propensity to consume is $c = 0.7$. What is the overall effect on income and employment?
- (d) The government plans to adopt policies that would mitigate the recession. Its options are:
- i. decreasing public spending by 300 units in order to reach a balanced public budget,
 - ii. increasing public spending by 1000 units in order to reduce unemployment, for instance by constructing infrastructures.
 - iii. creating a system of direct transfers to the households, that is, introducing $Tr = 1000$.

Compare analytically the three options and compare the effects on income, employment, and public savings. Which one would you recommend?