1 Readings

1. Read Barro Chapters 1,2,3.

2. Read the note "EdgeWorth Box" on dropbox.

3. Read "Hall Jones QJE99 - Why do some countries produce more output per worker than others" in detail and summarize it in 500 words.


6. Skim "What Do We Know about Macroeconomics that Fisher and Wicksell did not" by Blanchard 2000.

2 EdgeWorth box and the General Equilibrium

In this problem we want to analyze how general equilibrium effects can be different from partial equilibrium ones.

Consider two types of agents: $N_F$ number of Farmers (F) and $N_M$ number of Manufacturing workers (M). Each $F$ owns $Y_0$ amount of Agricultural good and each $M$ own $X_0$ amount of manufacturing good. Both types of agents have $U(x,y) = \alpha \log x + (1-\alpha) \log y$ preferences over the two goods. These agents trade in a competitive market.
1. Setup the problem for each agent. Name income of the agents by $I_F$ and $I_M$ precisely determine both.

2. Solve each agent’s problem in terms of their income.

3. Define the competitive equilibrium in this problem. Write down the equilibrium conditions.

4. Solve for the equilibrium allocations and prices: How much of each good, each agent consumes and what is the relative price of $Y$ to $X$ ($q$).

5. Comparative statics: Show how do changes in each of the following exogenous parameters affect the agents consumption of each good, their welfare, their income and the relative price $q$. Show how do partial and general equilibrium results differ. Explain your analysis in words in each case (write economical arguments on why we observe these equilibrium outcomes)

   (a) $X_0$

   (b) $Y_0$

   (c) $N_F$

   (d) $\alpha$

6. Suppose $N_F = N_M = N$. What would happen to the relative price $q$ if each agent $F$ or $M$ owned the bundle $(X_0/2, Y_0/2)$ of goods $X, Y$. Explain why do we observe such a property and what does it teach us?

7. Now suppose the agents preferences is CES : $U (x, y) = \left( \alpha x^{\rho-1} + (1 - \alpha) y^{\rho-1} \right)^{\frac{1}{\rho-1}}$.

   (a) Find the demand function for each good/agent and for the market.

   (b) Plot the demand function of Farmers for the agricultural goods.

   (c) Now solve for the competitive equilibrium again. How do your results for allocation and prices change quantitatively and qualitatively for each case $\rho > 1$ or $0 < \rho < 1$? What about your comparative statics? Feel free to use software anywhere needed or use specific number for the parameters if you need.
(d) How does parameter $\rho$ play a role in the results you have found? How do results change whether $\rho > 1$ or $0 < \rho < 1$?

(e) What if $\rho = 1$?

8. Now suppose the preference functions of the agents are different: Farmers: $U_F(x,y) = \alpha \log x + (1 - \alpha) \log y$ But Manufacturers: $U_M(x,y) = \log y$ (This problem can be interpreted as one agent type is a worker of the economy who produces Non-Oil GDP and has preferences over Non-oil GDP good and Energy. the other agent is the government who owns Energy sector but needs to consume Non-Oil GDP.)

(a) Re-solve for the competitive equilibrium (although the assumption of the competitiveness may not be relevant if we think of the government as one agent). How do your results change? Briefly explain the general equilibrium outcomes.