

Homework 3b (50 points)
(Due in class on 4/30/19)

Consider a country that produces two goods cloth (C) and food (F) with two factors of production: land (T) and labor (L). The technology for cloth and food are as follows.

$Q_c = \text{Min}\{\frac{1}{20}L, T\}$, $Q_F = \text{Min}\{\frac{1}{5}L, T\}$, where Q_c denotes the amount of cloth produced and Q_F denotes the amount of food produced. Denote the wage by w and the rent of land by r .

- a. Suppose that the economy's total resources are 600 hours of labor and 60 units of land. Determine the allocation of labor and land between the two goods algebraically and then show it diagrammatically.
- b. Now suppose that the labor supply increases first to 800, then 1000, then 1200 hours. In each case, determine the allocation of labor and land between the two goods algebraically and then show them diagrammatically. Verify the Rybczynski's theorem.
- c. What would happen if the labor supply were to increase even further, say to 1300?
- d. Suppose Westernia has 600 hours of labor and 60 units of land, while Easternia has 70 units of land and 800 units of labor. What is going to be the pattern of trade between these two countries?
- e. Now, suppose the autarky prices in the two countries are as follows. Westernia: $P_c=100$, $P_f=40$. Easternia: $P_c=80$, $P_f=50$. Calculate the autarky levels of wage and rent in both countries.
- f. Now, suppose the world trading price of the two goods is $P_c=90$, $P_f=45$. Calculate the factor prices in both countries in a trading equilibrium. Verify the Stolper-Samuelson theorem.