Lecture Supplement
Econ 335;
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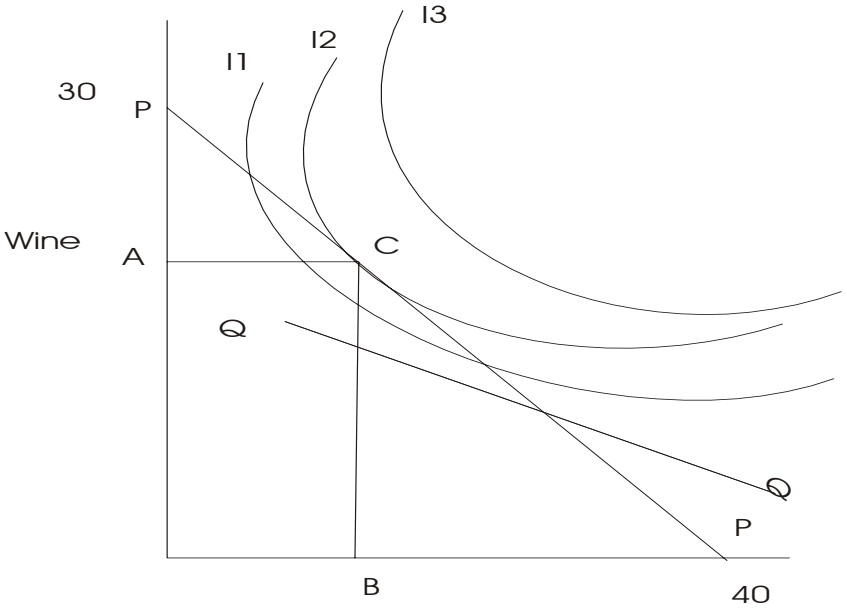
This material is relevant for understanding chapter 3 material in your text book.
This material is not in your text book.
Concepts:

- PPC or PPF
- Slope of the PPF denoting opportunity cost of producing one good in terms of the other good.
- Revenue maximizing output supply or production point on the PPF
- Utility maximizing consumption point on the budget line.
- Trade triangle describing import and export of goods in the economy at different prices.

Consider a Ricardian model with the following data

Country	Labor required to produce a unit of Wine	Labor required to produce a unit of Cloth	Labor availability
US	4	3	120
Foreign	2	1	100

Figure 1: PPF of US



-cloth-

Use the above PPF of the US to answer the following questions:

The equation of the PPF for the US: Let Xc and Xw be on the PPF, then they must satisfy the labor requirements:

$3Xc + 4Xw = 120.$

When you plot this on the graph with Xc on the x-axis, and Xw on the y-axis, you get the PPF for the US shown as the line PP in the graph.

1. The slope of the PPF is 1)- ½, 2) -2/3, *3) -3/4, 4)- 2 5) -1

2. (*T/F) The opportunity cost of producing one unit of cloth in terms of foregone production of wine is the absolute value of the slope of the above PPF line.

3. (T/F*) The opportunity cost of producing one unit of wine in terms of foregone production of cloth is the absolute value of slope of the above PPF line.

4. Suppose we normalize the price of wine (the y-axis good) to 1, i.e., $p_w = 1$, and denote the price of cloth in terms of wine as $p_{c|w}$. Then $p_{c|w}$ in autarky equilibrium price in the US is given by

   1) ½, 2) 2/3, *3) 3/4, 4) 2 5) 1

5. What will be autarky equilibrium price of wine in terms of cloth, $p_{w|c\ I}$ in the US?
   Ans: $1/ p_{c|w}.=4/3$

6. The autarky equilibrium consumption point in the US is 1) A 2) B *3)C,

7. What is the autarky equilibrium income level in the US, when income is measured in terms of wine?
   Ans: 30 (wine axis intercept of the PPF of the US)

8. What is the autarky equilibrium income level, when income is measured in terms of cloth?
   Ans: 40 (cloth axis intercept of the PPF of the US)

9. Suppose the autarky equilibrium consumption of wine is 20, i.e., A=20, what is the autarky equilibrium consumption level of cloth, i.e., value of B?
   Ans: 13.33 (plug Xw =20 and solve for Xc in the equation of the PPF or alternatively, if 20 units of wine is produced calculate how much labor is left over, and then with that labor how many units of cloth could be produced, since autarky consumption point is the same as the production point, the result follows).

10. Suppose the international price $p'_{c|w}$ is as depicted by the line QQ in the graph above. Is the international price of cloth in terms of wine is higher or lower than the autarky equilibrium price?

    Ans: lower, since it is less steep than the autarky equilibrium price level which is the slope of the PPF.

11. If QQ is the new price line how much of cloth and how much of wine the producers will supply to the market to maximize their revenue?

    Ans: Make the price line shift parallel to the right as far as you can go until you go out of the PPF, that will be the point P on the y-axis, i.e., they will produce 30 units of wine and 0 units of cloth.

12. What will be the new maximized revenue of the producers which is also the total income of the residents in the unit of wine?

    Ans: 30.

13. What will be the new maximized revenue of the producers which is also the total income of the residents in terms of cloth?

    Ans in the graph, where the new line QQ that is passing through the new production point P=(30,0) touches the x-axis, it is not shown.

14. Suppose the slope of QQ is –3/5. What will be the maximized revenue or income in terms of cloth?

    Ans: 30*5/3 = 50. (Since the absolute value slope of the iso-revenue line QQ is that of the PPF line PP, when we make this iso-revenue line move parallel to the right as far as possible without leaving the PPF, we will arrive at the point (0,30) i.e., no cloth and 30 units of wine as the revenue maximizing production decision.

15. If the international price is given by the slope of the line QQ, Would the US specialize in production of wine?

    Ans: Yes. (As we just seen in the previous exercise)

16. The Us will export wine or import wine?

    Ans: export wine.

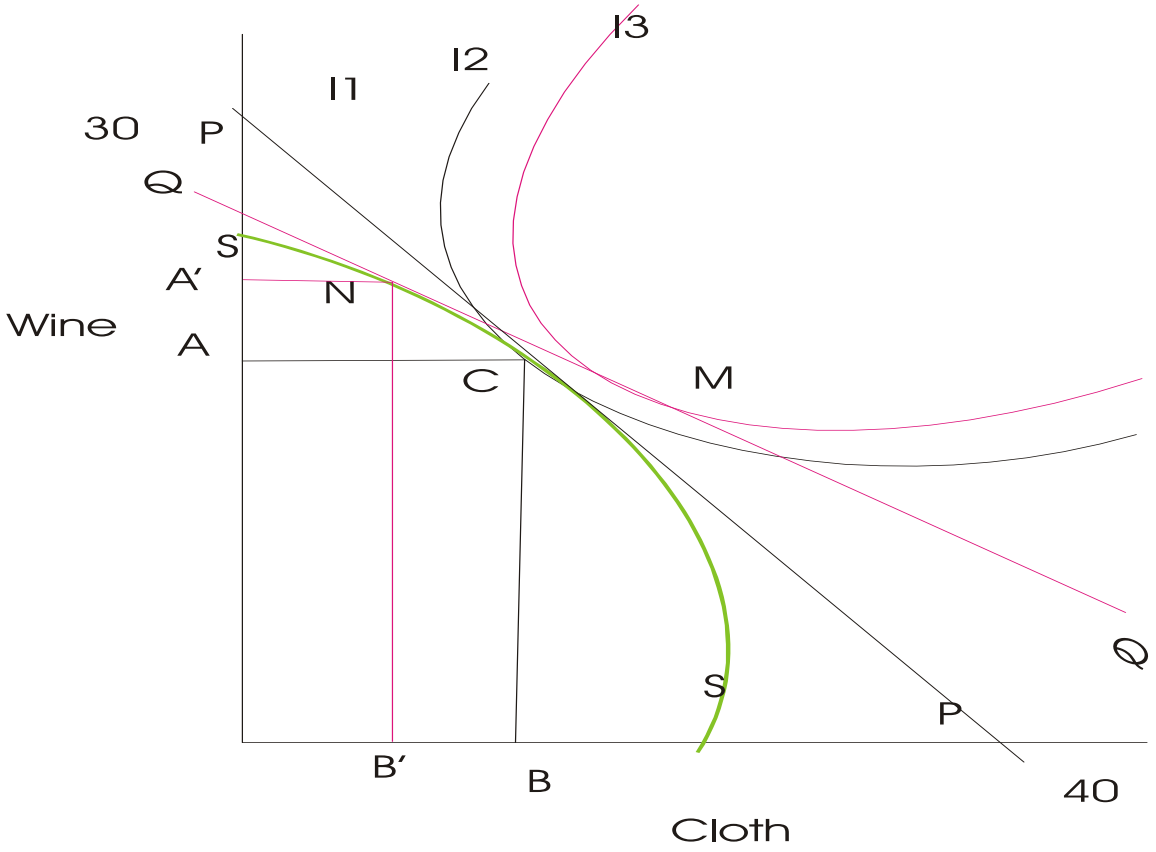
17. What will be the level of utility that US can achieve at the autarky:

    1) I1, *2)I2, 3) I3?

18. Terms of Trade of country is the ratio of the price of the exported good over the price of the imported good. What is the terms of trade when the international price is given by the slope of the line QQ as -3/5?

Ans: To answer that first determine which good the US will export and which good it will import. We see from the above figure that the US exports wine and imports cloth, and hence the terms of trade for the US is $p_w/p_{c|w} = 5/3$.

Consider the following PPF for the US which represents an increasing marginal cost of production, explain how the answers going to change in the above questions when we have this PPF in place of linear PPF. (if some of them could not be answered, just say so).



In the above diagram, red lines indicate situations with trade. A' and B' is the production of wine and cloth at the international price represented by the red line QQ.

Recall in the class we have explained how to get the demand curve for cloth and supply curve for cloth as function of the price $p_{c|w}$. Try to understand those and how the autarky equilibrium was also calculated from the demand curve meeting the supply curve according to that approach. Both approaches lead to the same result. Some approach is easier to understand for certain issues.