Chapter 1 Supplementary Questions

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Spring 2015

This problem set is your practice problem for chapter 1. I digressed a little from the textbook (it is somewhat opaque on PPF). No need to turn this in. Expect something similar to the following in your exam. Some questions are easy and some are challenging. I marked each question as follows for your reference:

★★★ You can solve this blindfold. This is meant to test your basic understanding of the material.

★★★ You might want to take off your blindfold.

★★★ This one calls for a light bulb moment. Think it through till your light comes on.

1. Suppose that Liz has $36 to spend on cheesecakes and tea. Cheesecake is $3 apiece and tea is $1 a cup.

    (a) ★★★ What is the maximum amount of cheesecakes that Liz can have?

    (b) ★★★ What is the opportunity cost of a cheesecake measured in terms of tea?

    (c) ★★★ Sketch the budget line with a number of cheesecakes on the horizontal axis and tea on the vertical axis.

    (d) ★★★ Suppose that there is a 100% inflation and cheesecake and tea are now sold for $6 a slice and $2 a cup each. What is the opportunity cost of a cheesecake measured in terms of tea? How does your answer compare to item 1b? Explain.

    (e) ★★★ Suppose that her income is not adjusted for incremental cost of living and remains $36 despite the inflation above. Sketch her new budget line after inflation.

    (f) ★★★ Would she be in favor of inflation? Compare your budget lines in items 1a and 1e to explain.

2. Consider an economy consisting of Katy Perry alone. She has 10 hours to spare on writing songs or grooming her cat, Kitty Purry. It takes her one hour to write one song and one hour to groom Kitty Purry once.

    (a) ★★★ With the number of songs on the horizontal axis and times of grooming on the vertical axis, sketch her production-possibility curve.

    (b) ★★★ What is her opportunity cost of writing a song measured in terms of the number of grooming?

    (c) ★★★ Sketch the production-possibility curve when she can write one song in 30 minutes.

    (d) ★★★ Explain why the production-possibility curve changed its shape from item 2a to item 2c using the term "opportunity cost".

3. Consider an economy with two producers, Liz and Kenneth. Liz works for ten hours and Kenneth works for twenty hours. They can either work as a page or come up with a joke for a show. They can make one candy run in an hour each. Liz can come up with a joke every 30 minutes, whereas Kenneth takes an hour to come up with one. Assume that they cannot come up with a joke while they are on the candy run.

    (a) ★★★ What would be the largest number of jokes they can come up with together?

    (b) ★★★ What is Liz's opportunity cost of a joke in terms of candy runs?

    (c) ★★★ Who is better at candy runs? Explain.

    (d) ★★★ Suppose that they are spending all their time to make jokes. Who should go get candies and how many jokes do they have to give up for one candy run?

    (e) ★★★ Sketch the production-possibility frontier (PPF) of this economy with a number of jokes on the horizontal axis and a number of candy runs made on the vertical axis.

    (f) ★★★ Sketch a combination of jokes and candy runs that can be attainable if we switch Liz and Kenneth in a *wrong* order in item 3d.

    (g) ★★★ Explain why your graph in item 3f is *not* a PPF.

    (h) ★★★ Suppose that they have decided to produce jokes alone and no candy runs[1], and trade half of the jokes with an outsider Josh. Josh can come up with a joke every hour and do a candy run in 30 minutes. How many candy runs can Liz and Kenneth have Josh do in exchange for the jokes? (Hint: Consider how many hours imported jokes can free up for Josh).

4. Consider the economy where farmers produce corn. Its PPF is sketched in figure 1.

    (a) ★★★ If the economy chooses point A, how much corn do they consume this year and how much do they leave for next year?

    (b) ★★★ How much can they consume next year in item 4a?

    (c) ★★★ What is the opportunity cost of corn this year at point A in figure 1? How is this opportunity cost related to your answer to items 4a and 4b? Explain.

    (d) ★★★ If the economy chooses point B rather than A year after year, would this econmy's PPF grows farther than when the economy chooses point A? Explain.

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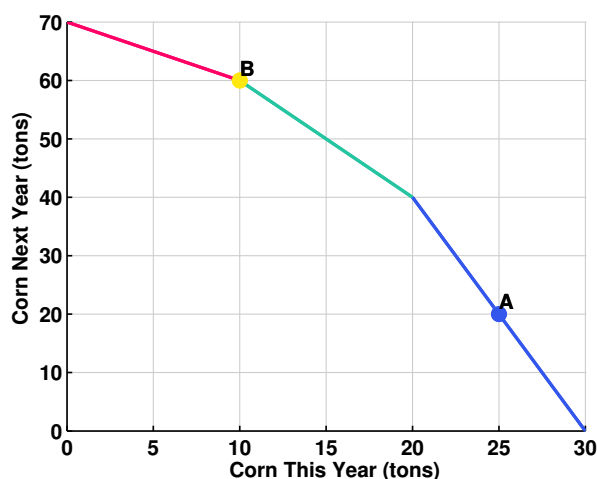[1]This is called specialization in international and urban economics.

Figure 1.

5. Consider an economy with two producers, Olaf and Baymax, who produce two commodities, snowballs and microbots. Olaf takes two minutes to make one snowball and four minutes to make one microbot, whereas Baymax takes one minute to make one snowball and one minute to make one microbot. Their PPF is represented in figure 2.
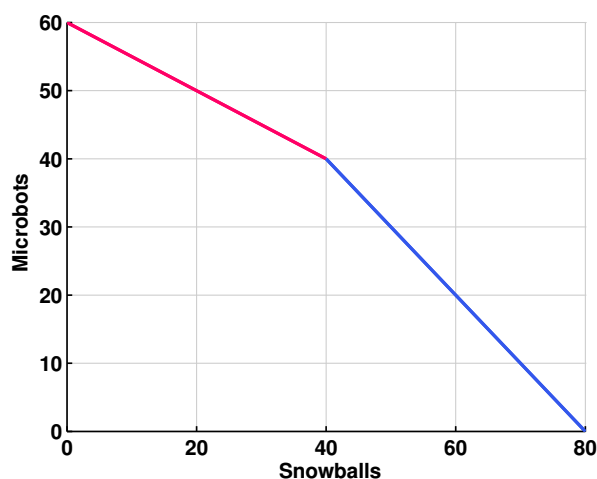

Figure 2.

   (a) ★★★ If Olaf has 80 minutes to work, how many minutes does Baymax have? (Hint: This is a situation where part of the factors of production, i.e., Baymax's labor input, is unknown. Fear not: You can still find his hours worked using the x- or y-intercept (either will do). Recall one of the five things you should know about PPC and work backwards).

   (b) ★★★ Who is switching in the red segment (0 to 20 snowballs) in figure 2?

   (c) ★★★ How many microbots is Olaf making at the kink in figure 2?

6. Consider an economy with two producers, Ralph and Owl City. They both have 20 hours each to either wreck it or write movie ending songs. Ralph can wreck it in an hour but cannot write a song at all. Owl City cannot wreck it at all but can write a song in two hours.

   (a) ★★★ What is Ralph's opportunity cost of wrecking it?

   (b) ★★★ What is Owl City's opportunity cost of writing a song?

   (c) ★★★ With the number of it wrecked on the horizontal axis and the number of songs written on the vertical axis, represent their PPF on a graph (Hint: Start with the y-intercept. From this point, to wreck it, Ralph will switch first (sort of...) Your answer to item 6a should tell you the slope here).

   (d) ★★★ Does the graph you plotted in item 6c meet five things you should know about PPC? Explain.

7. Consider an economy with one producer, Po. He has one week before an evil snow leopard, Tai Lung, comes back to destroy his town, which he is unaware of. Po can use his time to improve his kung fu skill or make noodle soup. He has zero kung fu skill but he can improve it by one level for every 24 hours of practice, whereas he can make one batch of noodle soup in 12 hours.

   (a) ★★★ What is the opportunity cost of improving his kung fu skill by one level?

   (b) ★★★ With his skill level achieved on the horizontal axis and the number of noodle soup batches made on the vertical axis, represent his PPF (Hint: There won't be any kink because there is only Po and his productivity does not change regardless of which combination he chooses).[2]

   (c) ★★★ If Tai Lung's kung fu level stands at ten, can Po save the town? Explain (Hint: Check the x-intercept).

   (d) ★★★ Suppose instead that a messenger goose told Po that Tai Lung is upon him at the beginning of the week. In this case, Po can improve his skill for every 12 hours rather than 24 (he seems to practice harder in the face of an imminent and confirmed threat). Update your graph in item 7b.

   (e) ★★★ Is the change in item 7d due to change in factors of production or change in technology? Explain.

   (f) ★★★ If the messenger goose told the news, can Po save the town? Explain.

   (g) ★★★ Refer to the cheesecake/tea example in class. The same change you derived in item 7d happens to the budget line when the price of cheesecake drops. Discuss similarities between these changes (Hint: Refer to the last item of the five (comparative statics) for both PPC and budget line).

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[2] The PPC is still convex but only in a weak sense.