

Midterm Exam.

Econ 101
Professor Guse

Monday October 13, 2008.

Instructions. You have 55 minutes to complete the exam. There are 9 questions with a total of 55 points available. Please write your responses on the exam itself in the space provided. If you require additional space, write on the back of the page. You may refer only to your own handwritten, two-sided, “cheat sheet”. Calculators and all other references materials are *not* allowed. If a question asks for a numeric quantity you may leave your answer in expression form for full credit. (e.g. “ $\frac{40-30}{5}$ ” would be perfectly acceptable in place of “2”.) Be sure to label any diagrams you draw, to show your work and to explain your reasoning. Please turn in your cheat sheet with your exam. Thank you and good luck!

Name:

Pledge:

1. (2 points) If the price of an input decreases, what happens to the demand curve for that product (the output)?
 - (a) It increases / shifts to the left.
 - (b) It increases / shifts to the right.
 - (c) It decreases / shifts to the left.
 - (d) It decreases / shifts to the right.
 - (e) It does not change.

ANSWER. Input price changes shift *supply* curve for the output, not the demand curve. So (e) is the best choice.

2. (5 Points) A consumer with \$90 to spend on flashlights and sardines faces a price of \$9 each for flashlights and \$3 each for cans of sardines. In a diagram with with flashlights on the horizontal axis and sardines on the vertical, the slope of his budget line is equal to _____. Interpret this number. (Draw the diagram, if you like. It is not necessary.) **ANSWER** The

slope is equal to the price of flashlights divided by the price of sardines. The income level is irrelevant. That number is $\frac{P_{flash}}{P_{sard}} = \frac{9}{3}$. It means, the consumer *must* give up $\frac{9}{3}$ cans or sardines for a flashlight from any (interior)¹ point along the budget line.

3. (4 Points) Define *production possibility frontier (PPF)*. **ANSWER** PPFs are the limit points of output possibility combinations. To be a output combination on the PPF, it must first be *possible*. That is, it must be feasible to combine the resource base with current technology to produce the combination of outputs represented by a point on the PPF. Second, it must be on *frontier* of possibility. In other words, it must be impossible to produce more of one good in the combination of output without cutting back on another. For example, if a two-good society produces just food and housing, then the combination (50 houses, 100 tons of food) is on the PPF only if that combination is feasible and the only way to produce more houses is to produce something less than 100 tons of food.
4. (5 Points) Suppose the market for a normal good is competitive, describe what would happen to the equilibrium price and quantity if consumers' income increased? Explain. **ANSWER.** The demand curve would shift up (and to the right). We expect price to increase and quantity traded to increase.
5. (8 Points) When the price of bread is \$4.00 per loaf, Eve consumes 100 loaves of bread per year. Eve's own-price elasticity of demand for bread is -0.5 . Approximately, what is Eve's demand after the price decreases to \$3.60 per loaf? Be sure to show your work. **ANSWER** By definition the own-price elasticity, ε , it is the percentage change in quantity divided by the percentage change in price. So we have

$$\varepsilon = \frac{\% \Delta Q}{\% \Delta P}$$

A drop of 40 cents on \$4.00 is approximately a 10% drop (negative change) in price. So we have $\% \Delta P = -0.1$ and $\varepsilon = -0.5$. Using this we can solve for $\% \Delta Q$

$$\begin{aligned} \varepsilon &= \frac{\% \Delta Q}{\% \Delta P} \\ -0.5 &= \frac{\% \Delta Q}{.1} \end{aligned}$$

This implies that $\% \Delta Q = .05$. In other words, we can expect a 5% increase in the demand for bread, bringing the new demand to **approximately 105 loaves**. For those of you who are sticklers for precision and fans of the midpoint elasticity formula we have

¹Interior point = not an intercept point. If he is already at the point (10 flashlights, 0 sardines) then he has no sardines to give up for another flashlight.

$$\begin{aligned}
\varepsilon &= \frac{\% \Delta Q}{\% \Delta P} \\
\Rightarrow \varepsilon &= \frac{Q_{new} - Q_{old}}{P_{new} - P_{old}} \frac{P_{new} + P_{old}}{Q_{new} + Q_{old}} \\
\Rightarrow -0.5 &= \frac{Q_{new} - 100}{3.6 - 4.0} \frac{3.6 + 4.0}{Q_{new} + 100} \\
\Rightarrow -0.5(Q_{new} + 100)(3.6 - 4.0) &= (Q_{new} - 100)(3.6 + 4.0) \\
\Rightarrow -0.5(100)(3.6 - 4.0) &= Q_{new}(3.6 + 4.0) + 0.5(Q_{new})(3.6 - 4.0) - 100(3.6 + 4.0) \\
\Rightarrow Q_{new} &= \frac{100(3.6 + 4.0) - 0.5(100)(3.6 - 4.0)}{(3.6 + 4.0) + .5(3.6 - 4.0)}
\end{aligned}$$

which comes out to **105.4 loaves**.

6. (4 Points) Becker argues that the benefit of a lengthy appeal process in capital murder cases is _____, while the cost is _____. **ANSWER** Benefit of lengthy appeals process: lowers risk of executing wrongly convicted defendants. Cost: weakens deterrent effect of capital punishment on the theory that potential murderers would fear a certain and swift execution more than an long stay on death row. Becker says on page 3 of the article, “On the Economics of Capital Punishment”,

However, I believe along with Posner that the appeal process offers enormous protection not so much against wrongful conviction as against wrongful execution, so that there are very few, if any, documented cases of wrongful execution. And this process has been strengthened enormously with the development of DNA identification. However, lengthy appeals delay the execution of guilty murderers, and that can only lower the deterrent effect of capital punishment.

7. (5 Points) Wilford Brimley dies of a heart attack causing the demand for oats to plummet. This decreases the price of oats. Many farmers can choose to grow oats or barley. What will happen to the price of barley? Explain using a diagram. **ANSWER.** The assertion that farmers can grow either grain means that they are substitutes in production. Therefore a drop in the price of oats should lead to farmers growing more barley (all else equal). This would be represented by the supply curve for barley shifting down (and to the right). This lowers the prices of barley and increases the quantity of barley traded.
8. (12 Points) The price of cookies is \$1 each. The price of milk is \$1 per glass. When Cookie Monster (CM) is given \$300 in cash, he chooses to buy 250 cookies. On the other hand, if you give CM \$200 in cash and \$100 in milk vouchers, he spends all of his cash on cookies and drinks 100 glass of milk. In this case, what can you say about CM’s *marginal rate of substitution* of milk for cookies? In other words, what is CM’s MRS at the point (cookies, milk) = (200,100)? Explain using a diagram. Be sure to interpret your answer. **ANSWER** We know that when CM faced the unrestricted cash budget, he choose the point (250,50).

Therefore his MRS at that point must be exactly 1. That is, from the point (250, 50) CM is *willing* to give up 1 glass of milk to get a cookie. Since the point (200, 100) involves fewer cookies and more milk, he should be willing to give up more than one glass of milk for a cookie from this point. We cannot say much more about the MRS than that - just that it is greater than one glass per cookie. Note this is almost exactly the same problem as “Mice and Test Tubes” from one of the cold tests and also has strong parallels with “Barbie Dolls and Whiskey” from one of the recent homeworks.

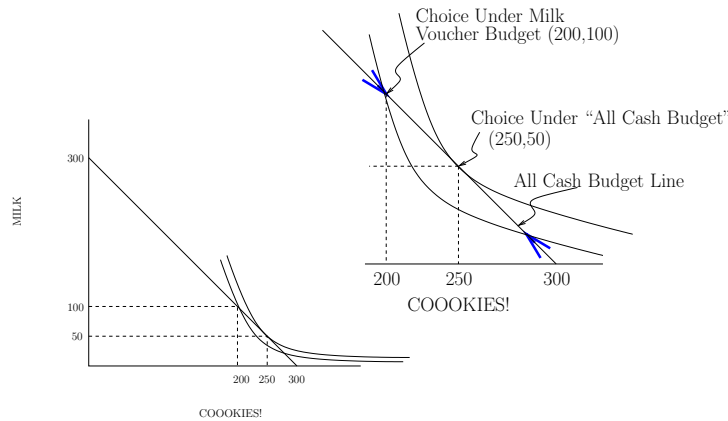


Figure 1. In the lower left we have a sketch of CM’s choice when faced with the all cash budget. The diagram in the upper right is a detail. Note that since CM chooses the point (250, 50) when given the cash budget, that must be the highest point (in preference) on that entire budget line. Therefore from any other point on that budget line, uphill he be toward that point. In the detail figure, the blue arrows indicate which way is up. The indifference curves drawn here are merely meant to be consistent with the assumption of convex preferences and the choices observed. Other shapes are possible.

9. (10 Points) The RNC’s PPF for GOP held U.S. Senate and House seats is bowed out.² Explain what this shape means for them. A good explanation will probably include a diagram.³
ANSWER It means that the opportunity cost in terms of lost House seats for gaining Senate seats increases in the number of Senate seats they gain. (Or state the converse - by swapping Senate and House in that sentence.) For example, suppose that if the RNC directed

²Abbreviations...

- RNC = Republican National Committee. The national organization representing the Republican party who coordinates campaign efforts of republican candidates among other things.
- GOP = “Grand Old Party”, a nickname for the Republican Party.
- PPF = production possibility frontier. (You should know that.)

³For sake of simplification, this problem has taken liberties with the process of funding Congressional campaigns. In actuality, each main political party has a generic national committee (RNC and DNC) as well as separate national committees to support their party’s senate and house races. For example the RCCC and RSCC support GOP candidates for the House and Senate respectively. It is not clear to me how easily funds move between the RNC the RCCC and the RSCC (or their Democratic counterparts), but it is clear that funds do get reallocated occasionally via the RNC. Moreover, even if campaign finance laws ever barred such transfers, party leaders could easily direct new donations toward the campaign committee which they felt needed it more, so the trade-off being considered here is a real one even if the technical details have been glossed over.

its resources only to support of House races and did nothing to support Senate races, it would still end up holding 35 seats and 300 seats in the House as shown in Figure 2. On the other hand, if it did the opposite it could increase its standing in the Senate to as many as 55, but that would mean having only 100 seats in the House. These two points represent the extreme points of the RNC's PPF. Note, in this example, how the outwardly bowed shape translates to increasing marginal cost. Going from 40 to 41 seats⁴ in the Senate would only mean a sacrifice of 3 House Seats (from 280 to 277 in the Figure), while moving from 50 to 51 would mean giving up 35 seats.⁵

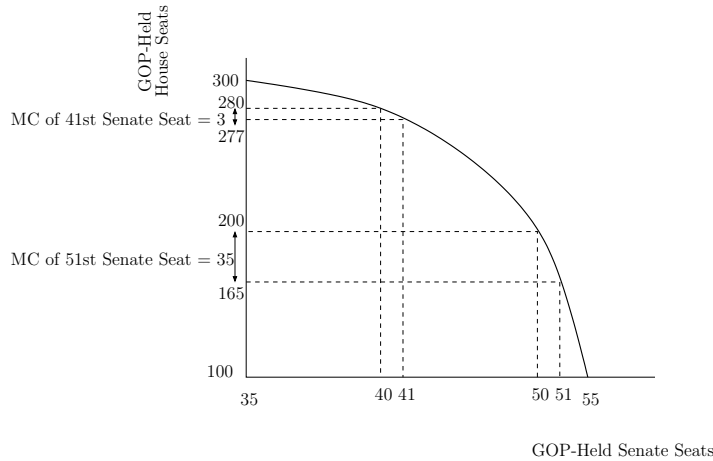


Figure 2. Hypothetical PPF for GOP-Held House and Senate Seats.

⁴A sixty seat majority in the Senate is often considered an important benchmark, because according to institutional rules 60 votes are required to break a filibuster. Hence the GOP controlling 41 seats would deny the Democrats a filibuster-proof majority

⁵There are 100 U.S. Senate Seats. In the real world, as of Oct 13, 2008, Democrats control 51 seats (49 Dems and 2 Independent who caucus with Dems), while Republicans control 49 seats. 51 would give the GOP a majority, if the Vice President (who can cast tie-breaking votes) turns out to be Biden. They would only need 50 for a majority if Palin become VP.