

ECON 30100 Price Theory I  
Highest-Scoring Answers from the Fall 2018 Final

FRANCESCO RUGGIERI\*

January 20, 2019

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\*For comments and/or suggestions, please e-mail [ruggieri@uchicago.edu](mailto:ruggieri@uchicago.edu).

## Question 1

**Introducing contraceptive methods in a society should decrease the number of unwanted births.**

*Answer #1 [8.5/10].* Uncertain. We can group sexual intercourses in two categories according to their main goal.

- (i) pleasure and children. This group will not use contraceptive methods, so nothing will change.
- (ii) pleasure only. People in this group will increase the number of sexual intercourses they get involved into, which could imply – if this number is very elastic to the drop in pregnancy probability – that the number of unwanted children increases.

*Answer #2 [8.5/10].* Uncertain. For a given level of sexual activity, the introduction of contraceptives decreases the probability of an unwanted pregnancy. However, by reducing the risk of unwanted pregnancy, the introduction of contraceptives will increase the level of sexual encounters (by reducing the cost). Furthermore, there will probably be a social multiplier effect, as social norms influence individual demand for sexual encounters (denoted  $s_i$ ) as  $\frac{ds^{\text{market}}}{dp} = \frac{\sum_i \frac{ds_i}{dp}}{1 - \frac{ds^{\text{market}}}{ds_i}}$ . Overall, we have:  $N_{\text{unwanted births}} = ps^{\text{market}}$ , with  $p$  probability of getting pregnant.  $p$  falls but  $s^{\text{market}}$  rises, so the effect could go both ways.

*Answer #3 [8.5/10].* Uncertain. Conceptually, sex is a good with two benefits – pleasure and wanted births – as well as one cost, unwanted births. Introducing contraception into the society reduces the price of sex, in the sense that it decreases the risk of getting pregnant each time you have sex. Then, we should anticipate an increase in the quantity of sex consumed. Thus, there are two countervailing effects:

- (i) the rate of unwanted pregnancies and the quantity of sex decrease;
- (ii) the quantity of sex increases.

Assuming contraception is not perfect, without more information on the elasticity of sex with respect to the risk of unwanted pregnancy, we cannot say more. Less elastic demand implies that the number of unwanted births falls, while very elastic demand could increase the number of unwanted births.

## Question 2

**Introducing contraceptive methods in a society decreases the cost to women of engaging in casual sexual activity. *True/False/Uncertain*: this will benefit women.**

*Answer #1 [8/10].* Uncertain. The direct effect should be weighted against the likely increase in the number of rapes that will occur in equilibrium. Without contraceptive methods, the rapist was somewhat dissuaded by the fact that – if the victim became pregnant – his identity would eventually come to light (due to DNA info). To sum up: women will benefit in the consensual sexual activity margin, but this will likely have to be compared against what changes in the unwanted sexual activity margin.

*Answer #2 [8/10].* Uncertain. As the cost of casual sexual activity falls, women can consume more of it. If they get utility from casual sexual activities, this will benefit women. However, as the opportunity cost of casual sexual encounters becomes lower, women lose some bargaining power in the decision to engage in casual sexual encounters (as the compensation from unwanted pregnancies becomes lower). Furthermore, it is likely that there is a substitution for men from marital to casual sexual activity. Thus, women can be hurt if they benefited from marital contracts (at least through complementarities in household production). Moreover, there are negative externalities for women to engage in casual sexual activities, such as reputation costs. Finally, as argued in the previous question, the increase in casual sexual activity can increase the risk of unwanted pregnancies out of marriage, which hurts women's expected income.

## Question 3

**Consider Christmas to be a celebratory occasion when families get together and exchange gifts. We do not expect the amount of money that each family member spends on gifts net of the gifts they receive to be increasing in her/his income.**

*Answer [7/10].* False. A family member in abject poverty will give a cheaper gift than a wealthy family member, on average. Suppose gift givers get utility  $\lambda u(x)$  from giving a gift  $x$ , where  $u(\cdot)$  is the utility of the gift recipient and  $\lambda \in (0, 1)$  (this is a coarse altruism argument – I realize gift giving can also be self-interested, but suppose it is all altruism here). The value of the gift is  $x$ , where  $x = x(c_1, \dots, c_n)$  and each  $c_i$  is a characteristic of the gift. The market price is just one characteristic of many  $c_i$ 's in gift-giving, however. Other

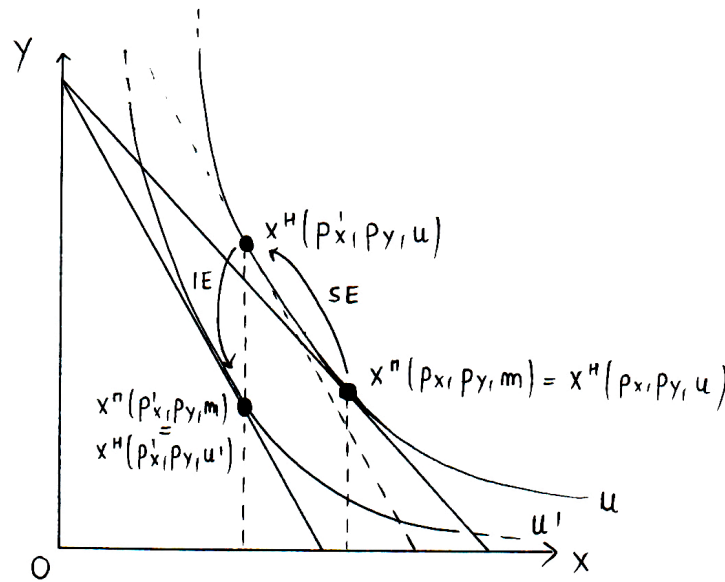
characteristics can include perceived thoughtfulness, relevance to the recipient's interests, rarity, etc. Poorer family members who give gifts to richer family members will substitute non-pecuniary inputs  $c_i$  for financial value of the gift, whereas richer family members will spend money as a substitute for thoughtfulness. This is why many "spoiled" kids do not have close emotional relationships with their very wealthy parents.

## Question 4

Since the Marshallian and Hicksian demand curves are the same for a good with zero income elasticity and utility is constant along the Hicksian demand curve, utility would be constant along the Marshallian demand curve for goods with zero income elasticity.

*Answer #1 [9/10].* False. If the price of good  $x$  increases, the budget set will shrink. The substitution effect is such that a consumer will reduce her consumption of good  $x$ . If the income effect is zero, she will not further reduce or partially increase her consumption of good  $x$  due to the fact that she has become poorer in real terms. Thus, the level of consumption of good  $x$  will not change due to the income effect. However, the consumer will be on a lower indifference curve, i.e., she will enjoy a lower level of utility.

Figure 1: Substitution and Income Effect of a Zero-Income-Elasticity Good Price Change



In the graph above, a consumer is indifferent between  $x^M(p_x, p_y, m) = x^H(p_x, p_y, u)$  and  $x^H(p'_x, p_y, u)$ . However, she strictly prefers  $x^M(p_x, p_y, m) = x^H(p_x, p_y, u)$  to  $x^M(p'_x, p_y, m) =$

$x^H(p'_x, p_y, u')$  because  $u' < u$ . Thus, utility is not constant along the Marshallian demand curve for goods with zero income elasticity.

*Answer #2 [9/10].* False. The Hicksian demand curve is a compensated demand curve, i.e., the agent is compensated so that they can afford a bundle on the same indifference curve. When price drops, in the Hicksian demand the agent loses just enough income to obtain the same utility, whereas in the Marshallian demand they do not lose any income so they can afford a bundle on a higher indifference curve. Thus, utility is increasing as prices decrease in the Marshallian demand curve.

## Question 5

**A decrease in the amount of cash people carry in their pockets, caused by technological improvements in electronic/card payments, will reduce the number of robberies.**

*Answer [10/10].* Uncertain. First, assume everyone but robbers do not change their behavior. Then robbers will face two pressures on their behavior. First, a substitution effect pushes them into other activities. Second, an income effect probably pushes them in the direction of increasing the number of robberies. People that are not robbers will face less risk of going out and have less incentive to be careful, as they will lose less if robbed. This will oppose the substitution effect since robbing will be easier. Overall, it is hard to say what will happen to the number of robberies.

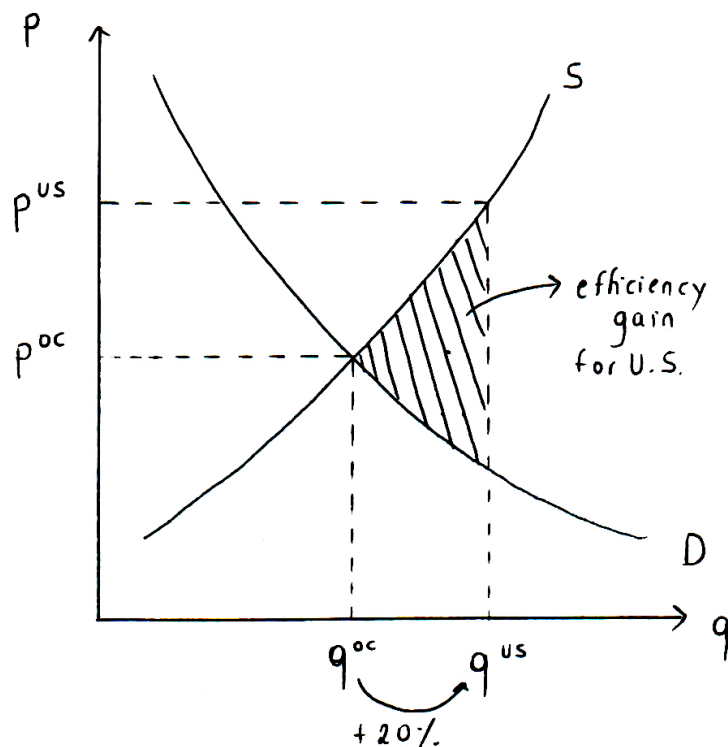
## Question 6

**The U.S. over-consumes health care and a similar country that has an efficient system would spend only half as much and consume 20 percent less health care (measured by quantity). *True/False/Uncertain*: the efficiency gain from moving to the more efficient system is somewhere between 20% and 50% of the U.S. expenditure level.**

*Answer #1 [9/10].* False. Note: the marginal cost and demand for health care are the same in both countries. By “efficient” we mean that the other country is in equilibrium, not that it has lower marginal cost. In the graph we see that  $\frac{q^{US}}{q^{OC}} = 1.2$  and  $\frac{p^{US}q^{US}}{p^{OC}q^{OC}} = 2$ . If the efficiency gain were equal to  $(q^{US} - q^{OC}) \times p^{US}$ , then it would be equal to 20 percent of U.S.

expenditure level. However, it is less, so the claim is false. Some of the extra units provide utility and profits, even if they are inefficient.

Figure 2: U.S. Gain from Moving to More Efficient Health Care System



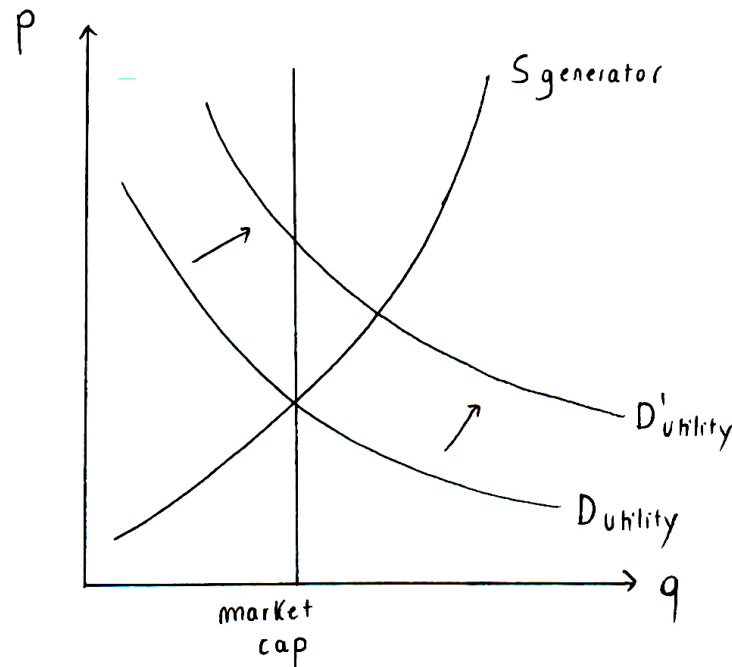
## Question 7

In the electricity market, consumers buy electricity from utilities who buy it from generators. *True/False/Uncertain*: a restriction on the electricity generation sector that prevents the creation of new generation capacity will benefit utility companies that own power generation capacity but also purchase power from third party power generators.

*Answer [9/10]*. Uncertain. First, let us consider what happens in the two markets. This graph models a capacity cap and then a subsequent increase in demand so that the cap has bite. The graph is a little off in the sense that the policy is to cap creation of new generation, so to reach it we need to think about the hypothetical supply/demand curves after some time in the absence of the cap. In any case, no new electricity generation capacity implies limits on electricity generation, and no competition from new entrants. Then, we would expect the electricity market for utilities to behave like there is a cap, with an increased price and a

decreased quantity demanded. Then, less electricity will be supplied in the consumer market and it will be more expensive. A company that owns generation will be able to sell this stock at a higher price, so they will be better off. Ability to use third party electricity generation only matters if buying it is profitable. The downside is if they were using a lot of third party electricity before, they will now face a higher price.

Figure 3: Capacity Cap in the Electricity Generation Market



## Question 8

Since the cost function is concave, consumers should prefer more variation in prices assuming nominal income is constant.

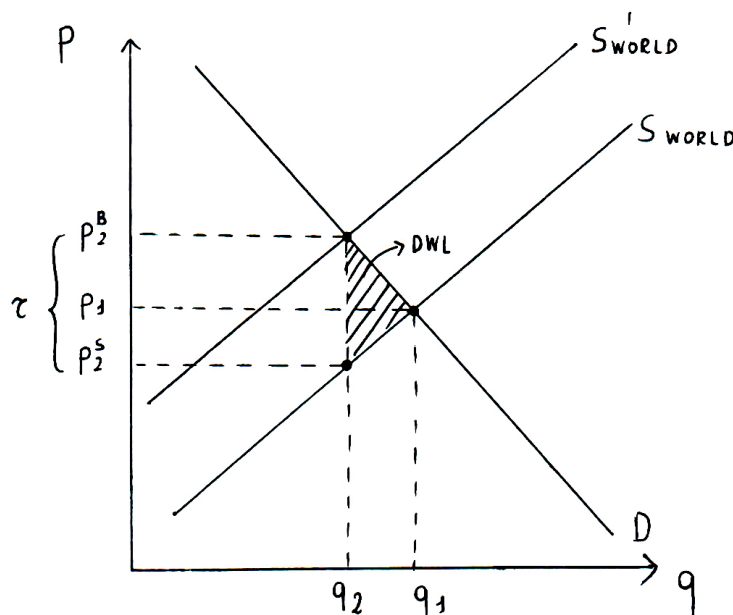
*Answer [9/10].* Uncertain. The thrust of this question is that maybe consumers would like prices to vary so that they can buy different goods when prices are low. This ignores some of the costs of price variation: consumers may need to buy goods more often or search/check for prices more often to take advantage from variation, thus incurring a search cost. Additionally, the question premise only makes sense if customers are not too risk averse: if the variation in prices creates a lot of disutility because the cost of your preferred basket of goods varies a lot, then price variation may be bad. Finally, for price variation to be good for you, it is better if you are able to substitute a lot. Nevertheless, if price variation produces enough of a gain in terms of real income, consumers may prefer it.

## Question 9

The loss to consumers from a tax on imported oil would harm consumers by an amount less than the tax times the original amount of oil imported since oil imports will fall as a result of the tax.

*Answer #1 [9/10].* Uncertain. Imported and domestic oil are close substitutes, i.e., consumers are indifferent between consuming oil from either source. Oil's global supply curve is the horizontal sum of domestic and foreign oil's supply curves. A tax on imported oil will shift foreign oil's supply curve – and therefore oil's global supply curve – upwards. Thus, the global price of oil will increase as a result of the tax on imported oil. This will favor domestic producers, who will be able to produce more. Imports will certainly decrease and domestic consumption will fall (assuming that domestic demand is not perfectly inelastic). In the graph below, the loss in consumer surplus corresponds to  $(p_2^B - p_1) \times q_2$  plus a fraction of the deadweight loss. This quantity cannot be directly compared to  $\tau \times q_1$  because consumption of imported oil as a share of total consumption before the tax is unknown. If all oil was imported before the tax, then the statement is true.

Figure 4: Market Equilibrium Before and After a Tax on Imported Oil



*Answer #2 [9/10].* Uncertain. As a result of the tax, there will be a substitution from imported oil towards other sources of energy. However, this increase in demand for other energy sources (e.g. domestic oil) will increase their price. If demand for these other sources



is less elastic than imported oil, then the resulting increase in expenditures for consumers could be higher than the tax times the original amount of oil imported (as the price of other sources of energy would sharply increase with the rise in demand).

*Answer #3 [9/10].* Uncertain. As long as demand is not perfectly inelastic, the fall in consumer surplus in the imported oil market will be less than the tax times the original oil imported. However, consumers of imported oil will have to resort to domestic oil, which – by revealed preference – is more costly. This higher price of oil could easily push the loss to consumers above that of the tax times the original oil amount imported.