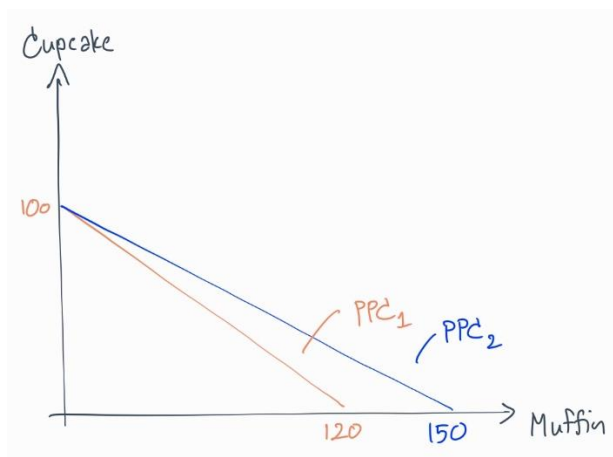


EE211 Assignment #1 KEY (2/2020)

1. Suppose that a baker can produce muffins and cupcakes. If she uses all her resources on producing muffins, she can bake 120 muffins. If she produces only cupcakes, she can bake 100 cupcakes.

(a) Draw the Production Possibility Curve of this baker, where the x-axis represents the quantity of muffins and y-axis represents the quantity of cupcakes. Assume that the PPC is a straight line. What is the opportunity cost of each cupcake?



According to the PPC_1 , total amount of cupcake and muffin feasible to be produced are 100 and 120 units respectively, which means that each and every cupcake produced, $120/100 = 1.2$ muffins must be given up. Therefore, **1.2 muffins is the opportunity cost for each cupcake.**

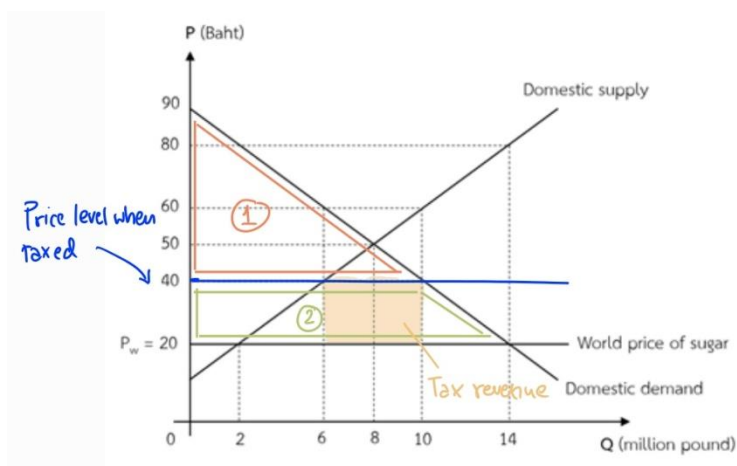
(b) With her available resources, can this baker make 60 cupcakes and 50 muffins? Justify your answer.

Due to the opportunity cost of a cupcake being 1.2 muffins, producing 60 cupcakes leads to giving up $1.2 \times 60 = 72$ muffins. Now that we know total amount of muffins feasible to be produced is 120, $120 - 72 = 48$ muffins in total for the remaining resource. Hence, **60 cupcakes and 50 muffins is not a feasible combination.**

(c) If the baker learns a new technique and now the maximum quantity of muffins she can produce is 150 muffins, while the maximum quantity of cupcakes she can produce is still 100 cupcakes, *ceteris paribus*. Will the opportunity cost of each cupcake increase or decrease, and by what amount? Illustrate the change of the Production Possibility Curve of this baker.

Now that she can produce muffin even more efficiently, the cost of making cupcake must be **increasing** from 1.2 to $150/100 = 1.5$ muffins according to the PPC_2 .

2. Supposed that sugar is traded freely in the world market, Thai people consume domestically produced sugar while the rest is imported. Given that world market price is 20 baht per pound and the government decides to set domestic ceiling price equally to the world price, below graph shows domestic demand, supply and world price level. Answer the following questions.



(a) Supposed that Thailand takes world price, how many pounds of sugar is imported at the world price level?

If sugar in Thailand is 20 Baht, there will be quantity demanded of 14 million pounds while domestically supplied for only 2 million pounds. Therefore, this excess demanded must be fulfilled with imports of $14 - 2 = 12$ million pounds.

(b) If the government further decides to collect an import unit tax of 20 baht per pound and the price after tax becomes 40 baht per pound, how much of the sugar is domestically produced in Thailand after tax?

If import unit tax is imposed, it will lead to the world price increase from 20 to 40 Baht. At that price, **6 million pounds** of sugar (on the domestic supply line) will be produced domestically.

Note that the demand and supply does not shift since this tax is not imposed on either buyers or sellers. On the other hand, it is imposed on the importers which are not represented in this graph.

(c) After the import tax is imposed, compute the change in consumer surplus. Also highlight the change in consumer surplus in the provided graph. Are the domestic consumers better off or worse off? Clearly explain your answer.

- **Before tax:** consumer surplus is area (1) + (2) so the area of value is $(1/2) \times (90-20) \times 14 = 490$ million Baht.

- **After tax:** consumer surplus is only area (1) so the area of value is $(1/2) \times (90-40) \times 10 = 250$ million Baht.

Consumer surplus after the tax imposition is less since the consumers now buy at higher price (40 compares to 20) and total quantity traded is reduced (14 to 10 million pounds). Therefore, their surplus is reduced by $490 - 250 = 240$ million Baht or they become worse off.

(d) Compute the government revenue from the import tax and identify its area in the provided graph. Clearly explain why the area identified above represents the government revenue from the import tax.

The area of tax revenue is a square under the domestic equilibrium (yellow shaded area). The height represents value of the import unit tax and the length represents total unit of sugar imported. Total tax revenue is $(40-20) \times (10-6) = 80$ million Baht.

3. Suppose that the quantity demanded for sweetened green tea at Thammasat University is 5,000 bottles per month at the price 20 baht per bottle. Suppose further that the university imposes an excise tax of 5 baht per bottle so that the new price is 25 baht per bottle. At this new price, the quantity demanded drops to 3,000 bottles per month.

(a) Use POINT elasticity to calculate the price elasticity of demand at the NEW price.

$$\varepsilon_d = \frac{\Delta Q}{\Delta P} \cdot \frac{P}{Q} = \frac{5,000 - 3,000}{20 - 25} \cdot \frac{25}{3,000} = -3.33$$

For this question, we are looking for the price elasticity at the new price. Therefore, our new price must be P_1 since elasticity measure the sensitivity of quantity when the price departs from the point of measurement.

(b) Without any calculation, would the total sale revenue from selling sweetened green tea at Thammasat University decrease or increase? Explain by using the concept of price elasticity of demand.

When the price goes up for any product with elastic demand, total revenue would decrease. (We proved this mathematically in class.)

(c) Suppose that, as a result of imposing this tax on green tea, the quantity demanded for “Super Drink” increases from 2,500 to 3,000 bottles per month, all else constant. Calculate the cross-price elasticity of demand for “Super Drink”, with respect to the price of sweetened green tea.

$$\varepsilon_c = \frac{\Delta Q^a}{\Delta P^b} \cdot \frac{P^b}{Q^a} = \frac{3,000 - 2,500}{25 - 20} \cdot \frac{20}{2,500} = 0.8$$

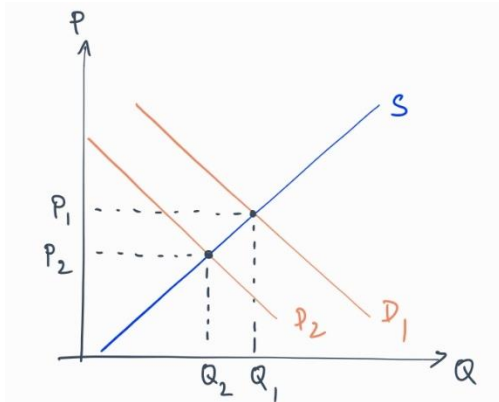
We consider the price of sweetened green tea to see the response of quantity change of Super Drink. Therefore, our “a” represents Super Drink and “b” represents sweetened green tea.

(d) From part (c), are sweetened green tea and Super Drink complements or substitutes? Explain.

The sign of cross-price elasticity is positive, which means that the slope of cross-price demand must be positive as well. Hence, these two products are substitutes since when price of sweetened green tea goes higher, the quantity demanded of Super Drink increases.

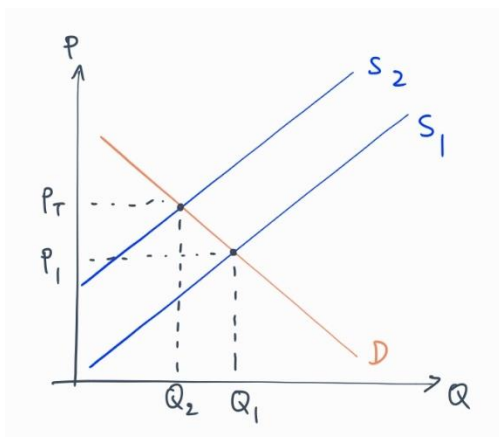
4. Consider a liquor market in a country, answer the following questions. If you have any specific assumption, please state them clearly within each item.

(a) Supposed that a Health Foundation which is an independent organization decides to put up a campaign showing how bad can alcoholic beverages affect health condition in long-term through several big billboards, what do you think will happen to this market, equilibrium price and quantity. Support your claim with economic reasoning.



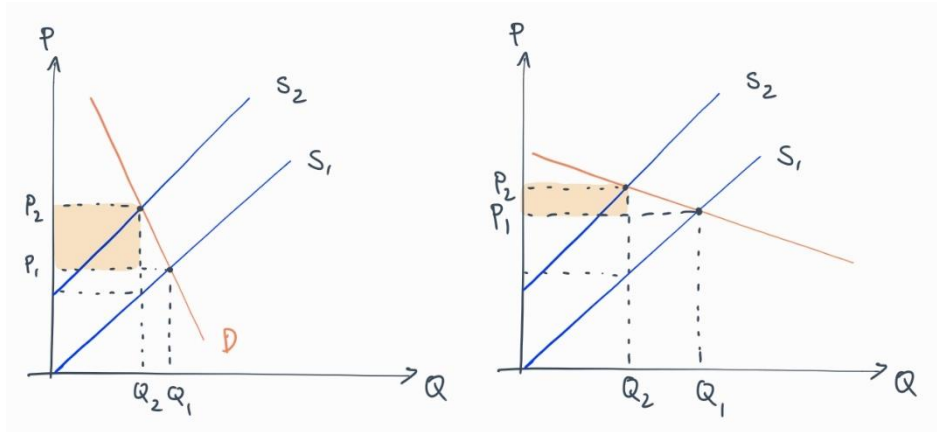
Targeting drinkers, we assume that this will affect some demand drop. If so, eventually, the campaign will lead to equilibrium price and quantity drop as portrayed above.

(b) If the government decides to collect unit tax on sellers, show that how would this affects equilibrium price and quantity. Provide a clear explanation with support of a diagram.



The seller will try to increase price by shifting the supply upwards, leading to increase in price but reduction in quantity.

(c) There are two groups of liquor consumers: the alcoholic and the occasional drinkers. Does the unit tax affect both groups the same or differently. Provide a clear explanation with support of diagrams.



Effect on these two groups will be different due to the difference in their elasticity. The inelastic tends to bear more burden when the seller raise the price (consumers' tax burden is displayed in yellow box).
