# Principles of Economics I: Microeconomics – Midterm [2017/11/10]

Note: You have 170 minutes (10:20am-1:10pm), and there are 100 + bonus 50 points.  Allocate your time wisely.

**Part A (50%): Excerpts of "Taiwan to levy duty on online purchases over NT$2,000" (Taiwan News, 2017/05/24)[1]**

TAIPEI (Taiwan News)—Frequent online shoppers beware!  Taiwan will roll out a new tax policy starting this September that will lower the tariff bar for imported goods shipped via oversea express delivery to NT$2,000 (US$66.37).  At the moment imported products purchased online with a value below NT$3,000 are exempt from tariffs, but the government aims to lower tariff bar to NT$2,000 by September.

Taiwan currently does not require online buyers of imported goods to pay tariffs or value-added tax (VAT) , but charges buyers of online domestic goods 5 percent VAT which is unreasonable and unfair to domestic online businesses, said Deputy Minister of Finance Su Jain-rong (蘇建榮)… (omitted)…

The policy, which was intended to go live by May 1, has been met with widespread objection from locals, and the Ministry of Finance received more than 500 messages from the public that resulted in the extension of the evaluation period.  Based on statistics compiled by the ministry, more than 21 million items by express mail from oversea worth NT$3,000 and below were imported into Taiwan, and nearly 20 percent of these products after tax were valued between NT$2,000 to NT$3,000 bringing the total amount of affected goods to nearly 4 million.

**Answer the following questions: (for bonus 50%)**

1. (4%) For most goods, there is a 10% tariff and a 5% VAT. Based on statistics provided, how much tax revenue could this new policy generate if consumers made the same purchasing decisions under the new threshold? Provide a dollar range for both tariff and VAT.
2. (6%) Consider a demand curve that has the function P = 5000 – Q.  How does this demand shift when per-unit tax (like the cigarette tax in Taiwan) is imposed on consumers?  How does the demand shift when a percentage tax is instead imposed?  Use two points on the demand curve to illustrate and write down new equations.
3. (2%) Consider the market for LEGO Star Wars BB-8 (Item#75187), currently selling at US$79.99 on Amazon.com, and assume Amazon.com offers free shipping to Taiwan.  Draw the Taiwanese demand curve for LEGO Star Wars BB-8 with and without a tariff threshold of NT$3,000.  Draw in the same figure the demand curve when the tariff threshold is lowered to NT$2,000.[2]
4. (8%) Draw a supply and demand diagram to analyze changes in equilibrium price and quantity, consumer surplus, producer surplus, tax revenue and total surplus when imposing a NT$3,000 tariff threshold.
5. (8%) Draw a supply and demand diagram and discuss changes in equilibrium price and quantity, consumer surplus, producer surplus, tax revenue and total surplus when lowering the tariff threshold to NT$2,000.
6. (3%) Do you think consumers would indeed make the same purchasing decisions under the tariff thresholds? Why or why not?  How would your answer to problem 1 be affected by this?
7. (9%) What if the Ministry of Finance decides to instead tax Amazon.com a fixed amount of US$12.01 for shipping the item to Taiwan?  Draw a supply and demand diagram and discuss the effect on equilibrium price

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[1] URL: https://www.taiwannews.com.tw/en/news/3171117
[2] The 10% tariff threshold applies to the oversea price including shipping.  Then, 5% VAT applies to the total price including the tariff.  This makes the effective tax rate 15.5%.  For example, when exchange rate is US$1 = NT$30 and tariff threshold is NT$2,000, the 5% VAT applies to an oversea price of (79.99 x 30 x 110%) = NT$2,640, so the price paid by consumer is 2640 x 105% = NT$2,772, or NT$2,400 plus a tax of NT$372. See: https://madbuy.net/海外購物狂-不可不知的關稅二三事/

and quantity, consumer surplus, producer surplus, tax revenue and total surplus. Would your answers change if Amazon.com decides to charge the exact same amount as shipping cost? Explain.

8. (8%) Since there was a public uproar against the decision to tax Amazon.com (which caused them to stop the free shipping promotion), the Ministry of Finance reverts back to taxing consumers (as in problem 3). However, Amazon.com decides not to revive free shipping. Draw a supply and demand diagram and analyze the change in equilibrium price and quantity, consumer surplus, producer surplus, tax revenue and total surplus.

9. (2%) What does your analysis say about the widespread objection from locals when the Ministry of Finance first intended to impose this policy in May 1, 2017? Explain.

**Part B (44%): Excerpts of "Busman's holiday: London's buses are losing passengers" (Economist, 10/19/2017)[3]**

| | | Passenger journeys on local bus services London | Local bus fares index  for London adjusted for inflation using RPI |
|---|---|---|---|
| **2015** | **Apr-Jun** | 581 | 124.3 |
| | **Jul-Sep** | 575 | 124.1 |
| | **Oct-Dec** | 572 | 123.8 |
| **2016** | **Jan-Mar** | 565 | 124.6 |
| | **Apr-Jun** | 564 | 123.8 |
| | **Jul-Sep** | 558 | 119.6 |
| | **Oct-Dec** | 560 | 118.8 |
| **2017** | **Jan-Mar** | 560 | 118.6 |
| | **Apr-Jun** | 560 | 117.4 |

...Buses are the busiest mode of transport in the capital. Two-thirds more journeys are taken on them than on the Underground. Until 2014 passenger numbers had been growing steadily for about a decade. But in the past three years they have fallen by about 6%. The decline comes even as the capital's population continues to grow and employment rises. Whereas more people travel on the Tube and the Docklands Light Railway, they are stepping off the buses. The congestion that so enrages bus drivers is partly to blame. Growing fleets of delivery vans are clogging up London's roads, which are dug up more often than those of some other capitals. Between 2012 and 2015 disruption from planned roadworks increased by more than 360%. As a result, buses are travelling more slowly. Speeds have fallen from an average of 9.7mph (15.6kph) in 2013-14 to 9.3mph in 2016-17. Use has fallen fastest on those routes with the biggest drops in speed. On those where speeds are down by more than 8%, use is down by 16%. Some people are switching to the Tube. Smartphone apps that give real-time updates may also play a part, reckons Leon Daniels of Transport for London, the transport authority. Apps like Citymapper make the bus network easier to navigate, but knowing a bus is ten minutes away may mean a person walks...

**Answer the following questions:**

1. (8%) Use the midpoint method to calculate the percentage change in average bus speed for the past three years. Calculate the "speed elasticity of demand," or consumer sensitivity to bus speed, treating passenger numbers as a good measure of quantity demanded.

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[3] Article URL: https://www.economist.com/news/britain/21730478-efforts-get-cars-londons-streets-are-also-driving-people-buses-londons-buses-are; Bus data: https://www.gov.uk/government/statistics/quarterly-bus-statistics-april-to-june-2017

2. (8%) The article assumes it should be surprising that "Use has fallen fastest on those routes with the biggest drops in speed." Explain why this is to be expected if speed elasticity of demand were constant across all passengers. If this is indeed the case, what is the average percentage speed drop for all routes "where speeds are down by more than 8%"? Do you think this assumption of constant speed elasticity of demand is reasonable? Explain. (Hint: Is your estimate for average speed drop reasonable? Why or why not?)

3. (16%) Draw a supply and demand diagram and show how the London the taste for bus speed affects the equilibrium price of bus fares and quantity of passenger journeys through buses, as well as consumer surplus, producer surplus, and total surplus.

4. (8%) Use the midpoint method to calculate the percentage change in bus usage for Oct-Dec in 2015 and 2016. What is the percentage price change in that same period (using again the midpoint method)? Calculate the price elasticity of demand in bus usage with these numbers.

5. (4%) Does the result of your calculation violate the law of demand? Why or why not?

**Part C (30%): Excerpts from "尖叫聲 94 分貝！嬤帶 5 孫租屋 遭投訴迫搬" (By TVBS, 2017/10/26)[4]**

高雄有一個阿嬤獨自撫養 5 個孫子，租屋在高雄鳳山，但 5 個小孫子活潑好動，時常發出刺耳的尖叫聲。… (omitted)…關起房門在走道拿分貝器測量，平時落在 50 到 70 分貝，只要孩子一哭鬧數字瞬間飆升，最高測得 94.5 分貝，至少前後有 4 名租客，向房屋代管人的陳小姐反應，代管人才會限期要阿嬤帶著 5 個孫子，一週內搬出去，但阿嬤說房子找到，但沒錢付租金，想到這委屈落淚。

當事人姬阿嬤：「住在樓上的有心人，不知道什麼原因啊，是怎麼樣就聯手要把我趕出去，真的很狠心！」面對指控陳姓代管人喊冤，說阿嬤和孫子 6 月搬進來後，因為噪音問題 7 月底一度搬離，她還退 1 個月房租，並掏腰包 1300 元搬家費，八月份阿嬤跟 5 個孫子又搬回來，依舊沒改善；另外 10 月的租金、水電費尚未繳清，所以還沒點交退押金。房屋代管人陳小姐：「沒有繳租金 10 月份的，然後包括水電費扣一扣，其實退她頂多 1、2 千元啊！她也還沒準備跟我交屋，我也還沒辦法跟她結算。」

**Translation for Part C Article:** An old lady raising 5 grandchildren alone rents a house in Fongshan District, Kaohsiung, but her restless little grandchildren making frequent loud, piercing screams are causing troubles... (omitted)... Taking measurements with a meter behind closed door, noise volume level surges from a normal 50 to 70 decibels to a measured maximum 94.5 decibels when the kids cry. Having received complaints from at least four other tenants, the housing manager Miss Chen asked the old lady and her grandchildren to move out within one week. The old lady wept and said though she has found another place, she still cannot afford the rent. "Those people living upstairs, I don't know what their intentions are, they jointly forced me out. They are so cruel," said the old lady. Miss Chen explained that the old lady and her grandchildren first moved in in June, but moved out in July because of the noise problem. Chen said she not only returned them 1 month rent, but also paid for their $1,300 moving expense. The family moved back in August, but the noise condition did not improve. Chen said the old lady has not paid October's rent and utility bills yet, making her unable to return the deposit. "They did not pay October's rent and utilities, so she will at most get back $1000-$2000. She is not ready to move out, so I cannot settle the account with her," said Chen.

**Answer the following questions:**

1. (2%) What is the difference between having five children at home in July and in October? How does that affect neighbor's cost for enduring screaming children? (Hint: When are children more likely to stay home?)

2. (6%) Assume the monthly rent is NT$7,000. According to the article, the family moved out once in July. If the children has a legal right to scream, what is the lower bound for neighbor's cost for enduring screaming

children?  What is the maximum willingness-to-pay for the family to stay?  Did the private bargaining outcome achieve what was socially efficient (for at that time)?  Why or why not?

3. (6%) Later the family moved back. This time, housing manager Miss Chen will give the family at most NT$2000 to leave, but the family hasn't moved out yet.  What is the minimum willingness-to-pay for the family to stay?  What is the upper bound for neighbor's cost for enduring screaming children?  Did the private bargaining outcome achieve what was socially efficient (for this time)?  Why or why not?

4. (4%) If a group of NTU students are conducting a fund-raising campaign to help this family.  What is the maximum the student group would need to raise?  Is your answer affected by what the manager gives?

5. (6%) Who do you think has the property rights in this second case (where the family moved back)?  Would the private bargaining outcome change if property rights were assigned differently?  Why or why not?

6. (6%) Do you think the manager could have set up a tradable permit market for noise pollution to solve this problem?  Why or why not?  What are some other things that cannot benefit easily from such property right allocation and market creation process?  (Hint: How is noise pollution different from, say, carbon emissions?)

**Part D: (26%) Excerpts from "衛福部取消自費醫療機構收費上限 期發展國際觀光醫療" (聯合報 2017-10-15)[5]**

衛福部正式公告修訂「醫療費用收費標準核定作業參考原則」，取消非健保特約醫療機構的收費上限，若外國人到健保特約機構的自費價上限也一併取消。醫界一片叫好，認為外國人不應享受健保低價果實。但醫改會呼籲，各醫療院所應於網站公開價格，避免收費爭議。蔡英文政府推動新南向政策，希望發展國際醫療。衛福部醫事司長石崇良解釋，過去非健保特約醫療機構的自費價，不得超過健保價 2 倍，但外國人沒健保，沒道理收費也少，決定打開自費價的收費天花板；若外國人到健保特約機構就醫，也適用相同規定辦理。盼修訂原則後，能讓醫療院所更努力發展國際觀光醫療。… (omitted)

**Translation for Part D Article:** Taiwan Food and Drug Administration (TFDA) announced an amendment to its medical expense charging regulations, dropping the price ceilings regulating non-NHI-contracted clinics and hospitals, as well as price ceilings on foreigners using out-of-pocket services at NHI-contracted ones.  The policy was widely praised by the medical community, due to the belief that foreigners should be excluded from the benefits and low prices of Taiwan's National Health Insurance (NHI).  The Taiwan Healthcare Reform Foundation (THRF) urges medical institutions to make their prices available on their websites to avoid charging disputes.  The Tsai administration is promoting the New South bound Policy aiming at developing medical tourism. As Department of Medical Affairs Director-General Shih Chung-liang explains, in the past non-NHI-contracted clinics and hospitals were not allowed to charge any price more than two times that of the National Health Insurance.  But it makes no sense to charge them such a low price, since foreigners are not covered by [and don't pay for] the NHI.  This motivated the TFDA to lift the price ceiling on out-of-pocket medical services.  The new rule is also applicable to foreigners going to NHI-contracted clinics and hospitals.  Hopefully this new rule will induce clinics and hospitals to invest more effort in developing medical tourism…  (omitted)

**Answer the following questions:**

1. (12%) What is the effect of restricting out-of-pocket health care service prices to twice the amount paid by Taiwan's national health insurance?  What is the effect of allowing foreign patients to enter Taiwan's out-of-pocket medical market while keeping this restriction? Draw supply and demand diagrams to explain.

2. (8%) What is the effect of allowing foreign patients to enter Taiwan's out-of-pocket medical market and dropping the price cap?  Draw a supply and demand diagram to explain.

3. (6%) Which of the above situations would you recommend to the Ministry of Health and Welfare?  Explain.

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[5] URL: https://udn.com/news/story/7266/2758477