

# Principles of Economics I: Microeconomics – Final [2020/1/3]

Note: You have 180 minutes (9:10am-12:10pm) and there are 137 points. Allocate your time wisely.

## Part A (19%): Excerpts from “What has gone wrong at MotherCare?” by Dearbail Jordan (BBC, 2018/11/5)<sup>1</sup>

For many parents, MotherCare inspires warm memories of buying baby clothes or shopping for their first pram. But cold, hard reality has finally caught up with the retailer and it has announced plans to put its UK business into administration. Some 2,500 UK jobs are now on the line after MotherCare was unable to find a buyer for the operation. After 58 years of trading, MotherCare's name could soon disappear from the UK High Street - so what has gone wrong?

Like many struggling retailers, MotherCare has found itself squeezed by the big UK supermarkets, fast fashion brands and the internet. While it continues to have success overseas - its international business in countries such as India, Indonesia and Russia is not subject to administration - the UK is different...(omitted)

Meanwhile, fast fashion retailers such as Zara and H&M offer on-trend children's clothing at low prices. All the big supermarkets have clothing ranges for babies and children, such as Tesco's F&F and Sainsbury's Tu. One of the problems, says Mr Lim, is that MotherCare failed to differentiate itself from rivals as a specialist retailer. "It is all about creating a meaningful experience," he says. "For expectant parents, they don't know how much things are going to cost and what to buy [but] MotherCare didn't provide an environment where they were supported. "Parents didn't have a strong enough reason to go and visit MotherCare." (omitted)...

1. (3%) How is the demand for MotherCare's product affected by other brands beginning to sell similar products for babies and children with relatively cheaper price and wider ranges? How does MotherCare affect the demand of Tesco's F&F? Explain.
2. (5%) What market structure described in the textbook best describes the market MotherCare is in? Draw a diagram to show the new equilibrium price and quantity of MotherCare after other brands enter.
3. (2%) Assuming elastic demand of MotherCare's products, what would happen to total revenue if MotherCare boost its sales by offering discounts?
4. (5%) In what circumstance would MotherCare exit? Why does MotherCare's exit happen only in the UK, but not other countries? Do you think exit is the best strategy for MotherCare?
5. (4%) Assume there is little barrier of entry for fashion retailers. Is the long-run (market) supply curve flat? Why or why not? (Hint: Do the costs change as other fashion retailers enter or exit the market?)

## Part B (40%): Excerpts from “Why airlines are rushing to add premium economy seats: Revenue from upgraded meals and wider seats rivals business class for profits,” by Financial Times (2019/11/29)<sup>2</sup>

Airlines around the world have been rushing to add premium economy seats to their long-haul aircraft as it overtakes business as the most profitable class on a per square foot basis at some of the world's top carriers. The premium economy cabin typically offers wider seats with more legroom than standard economy, as well as more perks such as a welcome drink, larger in-flight TV screens and a slightly posher meal. For this added comfort, airlines are able to charge as much as 80 per cent more than an economy ticket for a product that takes up only slightly more space and does not cost the carrier much more to produce. "Premium economy is quite a cash cow for the airlines," said Ben Bettell of Counterpoint Market Intelligence, an aerospace consulting company. First introduced by Taiwanese EVA Air and Britain's Virgin Atlantic in the early 1990s, premium economy has soared in popularity over the past decade on long international flights with 36 airlines now offering the cabin...(omitted)...

The demand for premium economy has increased partly in response to the growing divergence between an economy class that has become increasingly cramped and a business class that has become much more luxurious, taking on much of the opulent features of first class with offerings of fully flat beds to fine wines. Daniel Roeska, aviation analyst at Bernstein, noted that premium economy today is comparable to what was offered in business class 15 years ago. John Strickland, a London-based aviation consultant, said: "Its emergence came from the hypothesis that some business travelers stuck in economy would be willing to pay a premium for a little more space, privacy and better catering. In addition, some leisure customers would upgrade for the same reasons." Others say the financial crisis of late-2008 also played a part in its growing popularity. Christophe Renard, vice-president at CWT Solutions Group, which manages business travel on behalf of companies, said offering premium economy was a way of easing losses due to travelers downgrading from business to economy as they sought to tighten their belts...(omitted)...

However, in spite of this, some carriers have been slow to introduce the cabin class. Mr. Strickland noted that the worry for many airlines has been that if they offer premium economy, then business class customers might trade down, sacrificing highly profitable margins. So far, this largely has not happened. Tim Clark, president of Emirates Airlines, said this concern was carefully considered before the carrier developed its premium economy offering...(omitted)

**First consider only leisure travelers who care solely about reaching exotic locations for vacation.**

1. (3%) Is air travel for leisure a homogeneous product? Why or why not? What market structure described in the textbook does this air travel market closest resemble?
2. (4%) How do airlines in this market determine prices and quantity? Assume there are many firms in the market and/or anti-trust laws that rule out price-fixing and other collusive practices.
3. (3%) Is the market outcome efficient? Why or why not?

**Next, consider the entire population, which is a mixture of leisure travelers, business travelers, etc.**

4. (4%) Why would some travelers prefer to fly premium economy class? Explain.
5. (3%) Is air travel in this market a homogeneous product? Why or why not? What market structure described in the textbook does this air travel market closest resemble?
6. (3%) How does introducing premium economy class affect the demand curve faced by EVA Air and Virgin Atlantic's then existing travel services? Explain.
7. (8%) How do EVA Air and Virgin Atlantic determine price and quantity for their premium economy class? Does your answer depend on the number of airlines operating the same routes? Explain.
8. (4%) Would long-run market outcome be efficient? Discuss both cases with and without entry barriers.
9. (4%) Explain how airlines introducing premium economy class resembles (or differs from) movie theaters offering student discounts or YouTube offering ad-free streaming service. Does airline profit increase?
10. (4%) Why would some airlines like Emirates hesitate to offer premium economy class? What does EVA Air and Virgin Atlantic's pioneering premium economy class say about their original line of products?

**Part C (28%): Excerpts from "深度評論：台灣薪資停滯的成因與解方" by 王平 (蘋果日報 2019/12/17)<sup>3</sup>**

... 一般認為自 1992 年起的外包和直接投資中國，為導致台灣薪資停滯的主要原因。這是因為中國的低勞動成本，造成台灣的薪資同時被反向連動 (backward linkage) 地壓制。這個論點雖然是合理的，但仍必須注意到，這個連動應只會影響到低技術勞工的薪資。由於高技術及低技術勞工這兩種勞工間的替代彈性極低(約為 1.4-1.5)，高技術勞工的薪資不應被影響太多。

接著是自 1996 年以來高等教育的過度擴張，對薪資停滯影響，應發生在中等技術勞工身上，類似自動化及機器人使用的影響。也就是說，將技職學校的人才錯置於中下程度的大學裡，會產生拉低中等技術勞工薪資的負面影響。這樣的解釋雖然很合理，而且我們也清楚教育系統的錯誤設計必須被修正，但由於高技術與中技術勞工之間較低的可替代性，仍然無法解釋高等技術勞工薪資的減緩。

...(omitted)...最後，讓我們檢視壓低成本的企業文化，這也是我認為近 20 多年來台灣薪資停滯的最主要原因。為了解大的架構，必須觀察到台灣不完整的產業轉型：自 1980 年以來，相較於先進國家，台灣的就業人口從製造業轉移至服務業的速度太慢，在 1985-2000 年期間，製造業的附加價值份額大幅度下降，同時不可忽略地，服務業的附加價值份額在 2000 年以後亦在下降。此種異常的產業轉型模式伴隨著製造業的生產力減緩，以及服務業創造就業、收入及成長的停滯，是對台灣經濟發展的一大隱憂。

在 2016 年，第二和第三級產業的月平均薪資(含薪水及加給)在 745 萬名員工中，僅約為 4 萬 8800 元台幣。而在其中兩項最大的子產業(製造業及零售批發業)的薪資，甚至更低(分別為 4 萬 7300 及 4 萬 5400 元)。薪資最高的兩者為電力供應業(9 萬 4300)及金融保險業(8 萬 5400)，而接著是 ICT 服務業及醫療健康服務業產業(分別為 6 萬 7700 及 6 萬 5200 元)。如下表所示，雖然製造業在 1981-1997 年間的平均薪資成長 3.72%，服務業成長 3.85%，但在 1998-2015 年間成長率卻較更低，分別為 1.44%及 1.09%。而自 1994 年以來，大部分的產業，以低於他們的邊際勞動產出的薪水來支付其員工。

平均薪資成長率(%)	1981-1997	1998-2015
製造業	3.72	1.44
服務業	3.85	1.09

在 1981-1997 以及 1998-2015 兩段期間，勞工收入份額 (labor income share) 從 51.3%下降至 42.1%，資本折舊流量份額從 11.2%翻倍至 22.9%，未減去固定成本的營業毛利率 (gross operative profit rate) 從 25.5%微幅上升至 28.5%。

(%)	1981-1997	1998-2015
勞工收入份額 (labor income share)	51.3	42.1
資本折舊流量份額	11.2	22.9
未減去固定成本的營業毛利率(gross operative profit rate)	25.5	28.5

這解釋了為何薪資停滯，而產出卻仍持續地成長。雖然製造業的勞工收入份額預期會下降，服務業的勞工收入份額卻也令人驚訝地下降。...(omitted)...簡而言之，所有的證據都指出自 1990 年代中期以來，出現了壓低成本的企業文化。這樣的現象在兩兆雙星的產業政策下更加惡化，並且營利事業所得稅從 25%減至 17%，亦減緩了藉由競爭而淘汰低生產效率企業的進程。因此，我們可以合理地視之為台灣薪資停滯的主要因素。...(omitted)

1. (4%) Why do low-skilled workers earn less wages in Taiwan? List at least two possible reasons.
2. (8%) Why would people in the “electricity supply,” finance, ICT (information and communications technology) and health care service industries command higher wages in Taiwan? Provide reasoning given the different characteristics of these industries.
3. (4%) Draw a supply-demand diagram and explain how the market may help to drive low-salary companies out of business if such it is due to solely “corporate culture.” (Hint: Which worker would be hired by firms without “cost-down” corporate culture? High-skilled or low-skilled? How would that affect productivity of these firms?)

4. (2%) Explain why the market may not be able to drive low-salary companies out of business if it is due to low worker productivity or if there are barriers of entry.
5. (4%) Taiwanese firms have offered only low salary to all workers for twenty years, but other firms in the world have offered different salary to different employees. Is the low salary in Taiwan more likely to be due to corporate culture, low productivity or barrier of entry? Explain.
6. (6%) What are possible reasons for Taiwanese firms to offer higher salary now? What public policy would foster this to happen? Explain.

**Part D (50%): Excerpts of “破 2000 元的 5G 資費，你會埋單嗎？用囚徒困境，看懂為何台灣 5G 標金會颯破天價，” by 陳慶徽 (商業週刊 2019/12/30)<sup>4</sup>**

價格 2000 元的 5G 手機上網資費，你會願意埋單嗎？台灣 5G 頻譜第一波釋照拍賣，自 12 月 10 日正式開跑後，截至 12 月 30 日、總計已經累計標出了高達 752.1 億元的天價標金，遠遠超過政府原先設定的底價 300 億元。這個數字，讓台灣大哥大總經理林之晨在受訪時都苦笑直言，台灣 5G 標金可能將「創世界紀錄」。這場由中華電信、遠傳電信、台灣大哥大、亞太電信、台灣之星參與的競標大賽，本次共開放 3.5GHz、28GHz 與 1800MHz 三個頻段。然而，才進入競標第 15 天，光是最熱門的 3.5GHz 頻段，就已經創造 737.68 億元的天價標金，是原先設定底價的兩倍多，而這個數字，在本週預計持續上看 800 億元。「董事長給的指令是，錢不是問題。」在被問到預計在 5G 佈建投入多少成本時，遠傳總經理井琪給出了「無上限」的答案，這反應了現在標金不斷創新高的競標現象。

1. (8%) Why is “staying in the 5G auction” a Prisoners’ dilemma for Taiwanese cellular service providers? Draw a payoff matrix and explain. Assume there are only two firms on the market, each limited to 14 of the 27 bands. Each firm chooses between demanding 14 bands (stay-in) or 13 bands (drop-out).
2. (8%) Is there any dominant strategy in this game? What is the Nash equilibrium? What do you predict will happen? Does your prediction match the on-going 5G auction in Taiwan?
3. (4%) How would your answers change if there are five firms instead of two, each limited to 10 bands? Explain. Now you may assume the two actions are demanding 6 bands (stay-in) or 5 bands (drop-out).

不過，天價標金的背後，可能就意味著未來 5G 的手機資費，也可能會是「天價級」。IDC 資深市場分析師葉振男估算，2000 元對台灣電信業者而言，會是初期較合乎成本的資費價位。電信業者的盤算是，藉由 5G 迭代，扭轉 4G 的 499 困境，拉高每用戶平均收入 (ARPU)，進行搶救營收大作戰。但，根據二十一世紀基金會的民調發現，近三成受訪者認為月租要低於 500 元、超過七成的受訪者認為不能超過 1000 元。若是 5G 標金持續創下新高，就代表電信業者的成本也將隨之提升，為了攤提 5G 佈建，以及之前 499 之亂留下的 4G 營收黑洞，未來民眾看到的 5G 資費方案，恐怕只會離七成民眾心目中的 1000 元門檻越來越遠。...(omitted)...

4. (8%) Consider the 4G pricing game between two cellular service providers, each having two actions, pricing at NT\$1,399 or NT\$499. Draw the payoff matrix and explain why it also resembles the Prisoners’ dilemma.
5. (8%) What do you predict will happen in this pricing game? How does your answer change if there are five firms instead of two? Does your answer match Taiwan’s recent 4G price war (499 for Mother’s day)?
6. (4%) Given past experience, do you think the prediction of “NT\$2,000 5G plans” would materialize in the future? Why or why not?
7. (4%) What is the asymmetric information problem a 5G auction is designed to solve? Is it about hidden action or hidden characteristics?
8. (6%) Is the fear of 5G service providers overcharging consumers an asymmetric information problem of hidden action or hidden characteristics? Is regulation required to solve this problem? Why or why not?

## Background Information:

According to the following article, bidding in Taiwan's 5G spectrum auction has concentrated on the 27 bands of 10MHz each in the 3.5GHz range. Each cellular service provider is limited to 10 bands, though past experience in 4G suggests one requires at least 5-6 bands to provide uninterrupted service. Bidding starts from the reserved price and increases 3% per day. Each providers state the number of bands they demand at the current price, and bidding ends when total bands demanded does not exceed 27.

### Excerpts from “5G 競價規則出爐！3.5GHz 頻段 27 區段底價 9 億元，需求超過 27 加價 3%” by 林上祚 (風傳媒(2019/10/16))<sup>5</sup>

國家通訊傳播委員會 (NCC) 今(16)日預告《行動寬頻業務競價作業注意事項》，為了讓 5G 頻譜競標速度能夠加快，NCC 決議 5G 頻譜競價採「多回合同時上升競價法」，競價標的由原本的「報價」，改為競價者「提出所需求頻寬」，競爭最熱門的 3.5GHz 頻段，共 27 個區段，每區段頻寬 10MHz、底價 9 億元，每家業者，5 家電信業者若競標之需求頻段合計超過 27 個，則下一回合競價之底價將提高 3%，NCC 預計在 12 月 10 日公開競價，若以 1 天競標 10 回合計算，3.5GHz 頻段之價格，1 天最高將調高 3 成以上。...(omitted)...本次 5G 頻譜標售，競爭最激烈的當屬 3.5GHz 的 27 個頻段，根據 4G 行動寬頻經驗，電信業者若要提供穩定的寬頻上網服務，在 3.5GHz 勢必得標下至少 50-60MHz 以上頻寬（即 5 至 6 個頻段需求），以目前 5 家電信業者均參與投標的情況下，5 家業者至少要有 1、2 家退出，需求頻段數才會降至 27 個以下，因此，12 月 10 日開始競標後，3.5GHz 頻段的底標價 9 億元，將在每次新回合競標過程，穩步調高底標價 3%，直到有業者退出為止。這樣「3 大」（中華、遠傳、台灣大）夾殺「2 小」（亞太、台灣之星）的競標規則，先前曾經遭到台灣之星總經理賴弦五批評，賴在 7 月時曾表示，5G 行動寬頻 3.5GHz 頻譜，若只有 3 大業者得標，將影響市場競爭，「NCC 的 5G 頻譜規劃會導致頻率資源分配失衡，競爭遲早會消滅，對消費者不會是最好的」，為了避免「3 大夾殺 2 小」的局面上演，台灣之星當時曾經建議 3.5GHz 取得之頻寬上限，應從 100MHz 降至 70 至 80MHz。

### Appendix for Part B: Translation of “深度評論：台灣薪資停滯的成因與解方”

...It is generally believed that the main reason for the stagnation in Taiwanese wages is outsourcing and direct investment to China starting from 1992. This is because China's low labor costs suppress Taiwanese wages through backward linkage. Although this argument is reasonable, it must be noted that this linkage should only affect low-skilled worker salary. Due to the extremely low elasticity of substitution between high-skilled and low-skilled workers (about 1.4-1.5), the wages of high-skilled workers should not be affected by much.

Then there is the excessive expansion of higher education since 1996. The impact on wage stagnation should affect middle-skilled workers, similar to the impact of automation and robotics. In other words, the misplacement of technical and vocational school students in below average universities will have the negative impact of lowering middle-skilled worker salary. Although this explanation is also reasonable and the wrong design of the education system clearly requires correction, it still cannot explain the slowdown in high-skilled worker wages due to the lower substitutability between high-skilled and middle-skilled workers.

...(omitted)... Finally, let's inspect the “cost-down” corporate culture, which I believe is the biggest reason Taiwanese wages have stagnated for more than 20 years. To understand the big picture, we begin from Taiwan's incomplete industrial transformation: The shift from manufacturing to service industries of Taiwan's employment population since 1980 is too slow compared to advanced countries. During 1985-2000, the value-added share of the manufacturing industry has fallen sharply, and so did that of the service industry after 2000. This abnormal industrial transformation, accompanied by the slowdown in manufacturing productivity and a stagnation in job creation, income and growth of the service industry, casts serious doubts on Taiwan's economic development.

In 2016, the average monthly wage (including salary and bonuses) was only about NT \$48,800 for the 7.45 million employees in secondary and tertiary industries. In the two largest sub-industries (manufacturing, retail and wholesale), wages are even lower (NT\$47,300 and NT\$45,400, respectively). The two with the highest wages are the electricity supply industry (NT\$94,300) and the financial and insurance industry (NT\$85,400), followed by the ICT services and healthcare services industries (NT\$67,700 and NT\$65,200, respectively). As shown in the following table, although the average wage growth rate of the manufacturing industry was 3.72% during the period of 1981-1997 and that of the service industry was 3.85%, the growth rates were relatively lower during 1998-2015, at 1.44% and 1.09%, respectively. Since 1994, most industries have paid their employees below their marginal product of labor.

During 1981-1997 and 1998-2015, labor income share decreased from 51.3% to 42.1%, and share of capital depreciation flow doubled from 11.2% to 22.9%. Gross operative profit rate increased slightly from 25.5% to 28.5%. This explains why wages have stagnated while output continued to grow. Although the labor income share decline in the manufacturing industry is expected, that in the service industry is a surprisingly...(omitted)...

In short, all evidence points to a “cost-down” corporate culture that has emerged since the mid-1990s. Such a phenomenon has worsened when the government promoted the “two-trillion, twin-star” industries, and the reduction of corporate income tax from 25% to 17% delayed the elimination of low-productivity firms through competition. Thus, this is indeed the main cause of stagnation in Taiwanese wages.

#### **Appendix for Part D: Translation of “破 2000 元的 5G 資費，你會埋單嗎？”**

Are you willing to pay for 2,000 NTD per month for 5G mobile internet service? The first phase of Taiwan 5G spectrum auctions was officially launched on December 10, and bidding has since sky-rocketed to a total of 75.21 billion NTD as of December 30, which far exceeds the reserve price of 30 billion NTD set by the government. This number made Jamie Lin, general manager of Taiwan Mobile, smile bitterly during the interview, saying that Taiwan's 5G auction revenue may “set a world record.” This bidding war, fought between Chunghwa Telecom, Far Eastone, Taiwan Mobile, Asia Pacific Telecom, and Taiwan Star, is for the release of three bands, 3.5GHz, 28GHz and 1800MHz. However, in 15 days, the most popular 3.5GHz band alone has already hit an unbelievable 73.768 billion NTD, which is more than double the reserve price, and is expected to hit 80 billion NTD this week. “Our chairman has already instructed us that money is not an issue.” When asked about its budget of 5G deployment, Chee Ching, the general manager of Far Eastone, hinted that it could be “unlimited,” which reflects the on-going record-breaking bidding war.

However, such astronomical revenue will likely result in astronomical 5G mobile monthly plans. IDC senior market analyst Andy Ye estimates that, for Taiwanese cellular service providers, 2,000 NTD per month would be required to cover initial deployment cost. The providers hope to solve the 499 dilemma of 4G services through the 5G iterations, and boost average revenue per user (ARPU). However, according to polls by the 21st Century Foundations, nearly 30% of the respondents expect to pay at most 500 NTD per month, and more than 70% of the respondents expect to pay no more than 1,000 NTD. If the 5G bidding war continues its record-breaking path, the cost of 5G services would also increase accordingly. To amortize the 5G deployment cost and make up for the revenue loss due to the previous 4G for 499 turmoil, future 5G service plans will likely fail to meet the 1,000 NTD limit expected by 70% of the people...(omitted)...

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<sup>1</sup> Article URL: <https://www.bbc.com/news/business-50288603>

<sup>2</sup> Article URL: <https://www.ft.com/content/41866d20-11f3-11ea-a225-db2f231cfeae>

<sup>3</sup> Article URL: <https://tw.appledaily.com/headline/20191217/7MKU4A3SP2ZTVJ4H6T4HMOYEMU/>

<sup>4</sup> Article URL: <https://www.businessweekly.com.tw/focus/blog/3001409>

<sup>5</sup> Article URL: <https://www.storm.mg/article/1835274>