

Principles of Microeconomics – Final Exam [2022/12/16]

Note: You have 170 minutes (10:20am-1:10pm) to earn 108 points. Allocate your time wisely.

Part A (30%): Excerpts of “How Will America Deal with Three Way Nuclear Deterrence” (2022/11/29)ⁱ

“By the 2030s the United States will, for the first time in its history, face two major nuclear powers as strategic competitors and potential adversaries. This will create new stresses on stability and new challenges for deterrence, assurance, arms control, and risk reduction,” declares the Nuclear Posture Review (NPR). America wants any successor to New START to cover nukes that are currently excluded. Among them are esoteric strategic Russian weapons under development, such as a nuclear-powered torpedo, and thousands of “non-strategic” or tactical nuclear weapons with a shorter range and usually a lower explosive power. For now, China seems uninterested in arms control. It says it will talk about limits only when America and Russia bring their stockpiles down to Chinese levels. In any case, it dislikes the intrusiveness of US-Russia verification regimes. For all of Mr. Putin’s nuclear threats, and American warnings of “catastrophic consequences”, the two sides still regularly exchange information about their strategic weapons.

First consider two-way nuclear confrontation in the past (vs. incoming three-way nuclear confrontation):

1. (3%) Is it easier to negotiate with a country with nuclear arsenal, compared to a country without? Explain how a country owning nuclear arsenal poses externality on other countries.
2. (3%) Consider the game of two countries both choosing whether to acquire nuclear arsenals. What would be the efficient outcome? Why do externalities make outcomes inefficient?
3. (2%) New START is a nuclear arms reduction treaty between the US and Russia, which indicates “successful management of the two-way nuclear confrontation so far.” Explain why such treaty is to be expected according to the Coase theorem.
4. (4%) How would the addition of China affect bargaining cost between the nuclear powers? How would this affect the current situation? Would the Coase theorem still apply? Why or why not?

Next, analyzes potential impacts of adding tactical nuclear weapons, compared to the case where all nuclear weapons are strategic. Note strategic nuclear weapons could eliminate your opponent, but not tactical ones.

5. Consider the case where nuclear powers have only strategic nuclear weapons and simultaneously choose once to use it or not.
 - a. (3%) How is this situation like the prisoners’ dilemma? Explain.
 - b. (3%) Do players have a dominant strategy in this game? What is the Nash equilibrium?
 - c. (3%) Do nuclear powers act according to the Nash equilibrium? How have they sustained cooperation? Explain it using the term repeated interaction.
6. Consider the game of nuclear powers where each chooses once to strike first or strike second (retaliate only if others strike first). If both strike first, both suffer substantial damage. If one strikes first and the opponent strikes second, one suffers substantial damage, but the opponent would be eliminated. If both decide to strike second, there is world peace and neither face any damage.
 - a. (3%) Do players have a dominant strategy in this game? What is the Nash equilibrium?
 - b. (2%) Do nuclear powers act according to the Nash equilibrium? Explain.
7. Now consider the case where nuclear powers have both strategic and tactical nuclear weapons.
 - a. (2%) How does tactical nuclear weapons increase retaliation options of the nuclear powers?
 - b. (2%) How would having more retaliation option hurt?

Part B (29%): Excerpts “How disappointed Taylor Swift fans explain Ticketmaster’s monopoly” (2022/11/21)ⁱⁱ

(omitted)...Over the past week, that giddy anticipation liquefied into bleak, resentful disappointment as tickets became increasingly difficult to purchase. According to Ticketmaster, there were approximately 14 million users on the site at once during the presale push, and the company sold 2.4 million presale tickets. The fans that got through — via a system of presale codes and designated purchase times—ran into numerous malfunctions, some being told to wait hours to be able to spend hundreds of dollars on seats.

Ticketmaster said on November 17 that it would not even be selling tickets to the general public. Millions of devoted fans were shut out of buying tickets altogether. On the surface, the problem looks like a classic case of Ticketmaster not being able to keep up with the demand. Swift issued a statement on social media saying that she and her team asked Ticketmaster repeatedly if they could handle the volume and intensity of her fandom, and compared the ragged experience to “several bear attacks.”

Krista Brown, a senior policy analyst at the American Economic Liberties Project (AELP), explained to me, this Swift failure is a symptom of a bigger problem. The AELP is a nonprofit, non-partisan organization that focuses on dismantling monopolies and lobbies to assert antitrust laws. It’s part of a coalition of organizations called “Break Up Ticketmaster” that seeks to undo the 2010 merger between Ticketmaster and concert promotion company Live Nation. Brown explains that merger gave Ticketmaster a virtual monopoly over ticket-buying consumers, artists like Swift, and the venues where they play. This week, the New York Times reported that the Department of Justice is reportedly going to open an antitrust investigation into Ticketmaster. In 2019, Ticketmaster’s parent company Live Nation agreed to settle with the DOJ over antitrust violations and extend terms of its regulatory decree (basically, a set of antitrust agreements that the DOJ made Live Nation promise to abide by in order to allow the merger happen).

Thanks to a web of exclusivity contracts with artists and venues, consumers usually have to go through Ticketmaster to see the artists they want to see. Artists face limits too, as many arenas and stadiums have Ticketmaster exclusivity deals wherein playing at a venue means using Ticketmaster as their vendor. Usually, a company doesn’t just go around upsetting its base with website crashes, absurd ticket pricing and fees, and being shut out of tickets; consumer loyalty matters to most corporations. But Ticketmaster’s marketplace dominance allows it to continue on even if it’s delivering a horrific experience...(omitted)

Answer the following questions regarding Ticketmaster:

1. (2%) According to the article, why do artists continue to employ ticket master amid the system crash? What economic concepts you have learned can help this apparent deficiency?
2. (4%) Which of the four market structures you learned in class is closest to the market for platforms for ticket-buyers, artists and venues? How would a firm like Ticketmaster in such a market structure determine the profit-maximizing price and quantity? Explain.
3. (4%) List at least three public policies to counter disproportional market power. Which one is used by the authorities here?

Now think about Taylor Swift herself to answer the following questions:

4. (3%) Which of the four market structures you learned in class is closest to the market for singers? Explain why Taylor Swift can sell such an enormous amount of tickets. (Hint: Do fans enjoy other good singers as they enjoy their favorite one? Is it feasible for a singer to serve the entire market?)
5. To maximize the profit, the record company plans to sell the tickets at two different prices for Taylor Swift's die-hard fans and for normal fans. Below is the demand schedule.
 - a. (3%) At which single price should the record company choose to charge for both die-hard fans and normal fans to maximize the profit?
 - b. (4%) At which price should the record company choose separately to charge for die-hard fans and normal fans to maximize the profit?

- c. (2%) Does consumer surplus decrease when the record company sets two prices? Explain.
- d. (4%) Which of the two pricing strategies is better for the society as a whole? Which is better for the record company? Are they the same? Explain.
- e. (2%) Why isn't the profit-maximizing strategy usually implemented by record companies? Explain.

| price | Taylor Swift's die-hard fans | Taylor Swift's normal fans |
|-------|------------------------------|----------------------------|
| \$400 | 0 | 0 |
| \$350 | 500 | 0 |
| \$300 | 1000 | 0 |
| \$250 | 1500 | 0 |
| \$200 | 2000 | 500 |
| \$150 | 2000 | 1500 |
| \$100 | 2000 | 2000 |

Part C (18%): Excerpts of "South Korea's Education Success Faltering" (2022/11/15)ⁱⁱⁱ

The bulk of Korean spending on education goes to hagwons, businesses that instruct children on preparing for tests and exams via intensive coaching. These tutoring firms have swelled into a 23.4 trillion won (US\$17 billion) industry by promising better exam results. (omitted) Korea has the worst mismatch between labor-market needs and job skills in the developed world, with half of the nation's university graduates ending up in roles that have little to do with their degrees. Part of the reason is Koreans' "golden ticket syndrome" that prioritizes entry to a prestigious university over attending a school that would help develop their lifelong passion and career, an OECD report found...(omitted)

The first part is about the golden ticket syndrome using the signaling theory.

1. (3%) Why do employers look for degrees from prestigious universities? Does your answer depend on whether college education improves one's productivity? Why or why not?
2. (5%) Students can choose whether to study excessively, or not. Explain how this situation is an example of the prisoners' dilemma. Do students have dominant strategies? Why or why not?
3. (4%) What is the Nash equilibrium? Does the Korean situation match equilibrium predictions? Explain.

Part C-2: Excerpts of "The Guilt of a South Korean Cram School Mogul" (2017/09/09)^{iv}

In the 1990s, Son Joo-eun was a much sought-after tutor offering only a select few affluent students tips on how to score well in the national college exam. Having grown up poor and landed a place at the elite Seoul National University, he easily took home 50 million won (\$47,000) from his tutoring work, enough to buy a standard two-bed room house in Seoul back then, each month. The life of the star hagwon teacher soon got on a fast track to fame and fortune. In 2000, he founded an online cram school, MegaStudy, offering test-prep courses to a much wider audience. The venture, which started off with five staff and an initial paid-in capital of 300 million won, became an instant sensation among students and parents, bringing him success that he had never imagined.

The second part analyzes the superstar economy of hagwon instructors.

4. (3%) Life of Son Joo-eun substantially changed once he launched MegaStudy. What factors in demand and production technology made this change possible? Specifically, are consumers only fond of the

leading hagwon instructor, or are they fine with some second-tier instructor? Is there technology for the leading hagwon instructor to serve the entire market? Explain.

5. (3%) MegaStudy is an online platform that connects instructors with students. Do you expect to see many of such match-making or trading platforms in the market? Why or why not?

Part D (32%): Excerpts of “Why Workers Just Won’t Stop Quitting” (2022/08/19)ⁱ

When people first began leaving their jobs en masse in early 2021, experts generally believed that the “Great Resignation” was a direct side effect of pandemic chaos and uncertainty. Many workers quit due to Covid-19 safety concerns or because their companies didn’t provide adequate remote-work support. Millions more left for more autonomy or meaning in their work; many of these shifts linked to lockdown reflection. And others quit for more money elsewhere, as the labour market tightened. (...) Klotz also believes that resignations have become somewhat self-perpetuating, potentially prolonging the period of quitting. “Turnover contagion is real,” he says. “When you have colleagues who leave first, it's almost always a bummer, because usually it's a little bit more work for you. At the same time, though, it puts the idea in your head that it's doable to make that leap. It’s hard to stop that cycle of resignations for organisations, because with each one, it's like it logically puts the idea in other people's minds about the possibility of it.”

First explore why the great resignation was likely a side effect of the pandemic. When the pandemic started, social distancing policies restricted certain businesses, such as restaurants, hair salons and movie theaters.

1. (8%) Which of the labor demand and/or labor supply were affected by the great resignation and how? Draw a supply-and-demand diagram to analyze the effect of the great resignation on equilibrium wage and employment. What is the effect on consumer surplus, producer surplus and total surplus?
2. (8%) Which of the labor demand and/or supply were affected by social distancing policies and how? Draw a supply-and-demand diagram to analyze the effect of social distancing policies on equilibrium wage and employment. What is the effect on consumer surplus, producer surplus and total surplus?
3. (4%) Draw a supply-and-demand diagram to analyze the effect of both the great resignation and social distancing policies on equilibrium wage and employment.
4. (2%) Is it possible to obtain the same effect on equilibrium wage and employment without the factor underlined in the excerpt? Explain.

Next analyzes the turnover contagion: Suppose that there are two workers (Worker 1 and Worker 2) at a company. Each of these workers can decide whether to ask for a change (e.g., pay raise, allowing remote work, and etc.) or keep the status quo. If no worker asks for a change, there will be no change. If there is only one worker asking for a change, he or she will be fired and the remaining worker must work longer to cover the vacancy (will earn current salary but it is costly to recover from excessive overtimes). If both workers ask for a change, both workers would be better off since it will be accepted.

5. (2%) Draw a payoff matrix to show how each worker’s choice affects the outcome.
6. (3%) Do workers have dominant strategies? What are the Nash equilibria of this game?
7. (3%) Which equilibrium outcome is better for both workers? Which equilibrium is more likely? Explain.
8. (2%) Given trend of great resignation, how do labor unions help improve workers’ payoffs? Explain.

ⁱ The Economist: <https://www.economist.com/united-states/2022/11/29/how-will-america-deal-with-three-way-nuclear-deterrence>

ⁱⁱ By Alex Abad-Santo, Vox: <https://www.vox.com/culture/2022/11/21/23471763/taylor-swift-ticketmaster-monopoly>

ⁱⁱⁱ Blumberg, *Taipei Times*: <https://www.taipeitimes.com/News/feat/archives/2022/11/15/2003788936>

^{iv} Bak Se-hwan, Korea Herald: https://www.koreaherald.com/view.php?ud=20170908000667&ACE_SEARCH=1

^v By Kate Morgan, BBC: <https://www.bbc.com/worklife/article/20220817-why-workers-just-wont-stop-quitting>