ECON-C5100 Digital Markets
Exam: 22 Feb 2021.
Instructor: Iivo Vehviläinen

The exam consists of four questions, with subquestions. The grading points per subquestion are shown to indicate the number of different points that you should make in your answer.

2. Google search is the most popular search engine in the world and free to use. Google makes its money by selling ad space through auctions.

   (a) Why is Google offering the service for free to the users? (2 p.)

   (b) Why does Google pay Apple to have its search engine to be the default choice on iPhones? (1 p.)

   (c) Why is Google using auctions to sell advertisement space? (3 p.)

   (d) Should the regulator force a split of Google search, e.g. so that we'd have two firms with separate search engines instead of one Google search? Argue both for and against such a decision (2 p.)

   (e) Continuing from d, how could the competition between the two regulator created search engines play out (2 p.)

   Model answers (what I had in mind + sample of the other approved answers):

(a) Google operates a multi-sided platform. By keeping the search free, it can attract more users than if it would require a payment (1 p.). Google is able to commercialize the number of users through data that the user activity creates with ad auctions and by other means (1 p.). Also accepted: Keeping the search free helps Google to block competition. Offering something with a zero price can have higher value because of the avoided transaction costs.

(b) Any of the following approved for (1 p.): Default search engine will increase the user base of Google. Also approved: Google is blocking competition, including from Apple. Google gets access to the data from iPhone users. iPhone users are likely to be wealthier than average and thereby they can be especially valuable users for Google to have access to.

(c) Auctions force buyers to compete with each other in order to win. If you post a price, that leaves out to possibility to make buyers compete over the item. (1 p.). It would impossible in practice to set optimal fixed prices for each search term & user combination. Auction is a mechanism for price discovery (1 p.). There is only a fixed amount of ads that Google can show on their search page (without ruining the user experience). This scarcity needs to be resolved by some means. Having a fixed price could mean that a user gets shown tens of ads per search. Auctions are a way to clear the market. (1 p.). Also accepted if other valid comparisons between auctions and posting prices or negotiations are given.

(d) Variety of arguments possible. For the split would be e.g. the need to restrict the market power of Google in order to protect consumers from Google's possibility to collect data, manipulate search results, etc. and to enhance competition over the search market (1 p.). Against the split would be that such a move could reduce the positive network effects within the platform, and it would be hard to implement in practical terms (1 p.). Note that 1) it is unclear if the split would enhance or reduce overall welfare and 2) even though Google has a strong position, the prices for ads are set competitively through auctions; the harm for consumers is more through other mechanisms.

(e) A variety of potential outcomes would be plausible, and this has been graded based on how coherent argument you have made. An example: If the platforms would pursue similar strategies, the network effects tend to lead back to the starting point, i.e. one dominant platform (1 p.). This suggests that the platforms would start to compete with some other dimensions, e.g. the handling of data, the types of services offered, or user experience (1 p.). A full answer would need some thought over the users: what is the extent of multihoming on each side.

3. Wolt is a Finnish food delivery service company. Consider first the following two sides of their platform: consumers and restaurants.

(a) What is the efficiency gain that the platform provides? (2 p.)

(b) What are the network externalities between the sides (inter-group) and within the sides (intra-group)? (2 p.)

(c) Draw an example of the indifference curves for the consumers and the restaurants in the Wolt platform with a given price. Explain what are the points where the curves intersect each other. Explain the points where the curves intersect with the horizontal and vertical axis. Upload a pdf/picture of your drawing. (2 p.)

(d) Despite the digital nature of the platform, the delivery of food still needs to take place physically. Like many such service providers, Wolt has used independent contractors for deliveries. One can consider these contractors as a third side of the platform. In that context, why do these workers get paid so little? (2 p.)

(e) Wolt is not the only food delivery company. How can competition impact Wolt's pricing or other strategic decisions? (2 p.)

Model answers:

(a) The platform reduces search (compare to walking from restaurant to restaurant), match (large variety on offer), and transaction (no need to physically go to a restaurant, no need to have space at the restaurants) frictions between consumers and restaurants. (2 p.).

(b) The inter-group externalities are positive: a restaurant benefits from having more customers and consumers benefit from a wider selection (1 p). Within the group restaurants may loose sales if other restaurants join, so the effect is negative. For consumers, having more people trying to place their orders at the same time may lead to congestion, making the effect negative (if you have noticed that the same could occur in restaurants as well, I'll also grant one point, though that doesn't remove the negative effect here). Also, reviews might be a channel for positive network externality. (1 p.).

(c) Below is one example. Red line is the indifference curve for the consumers, blue line for the restaurants. For consumers to join, there needs to be a minimum number of restaurants to make the platform worth the price, and vice versa. The prices determine where the indifference curves cross the horizontal and vertical axes, i.e. the number of restaurants or consumers that would be needed for any participants from the other side to join. The shapes of the curve result from two factors: 1) each additional user values the platform less and requires a higher number of users on the other side to join and also 2) each user dislikes other users on the same side of the platform (assuming the congestion argument for the

consumers). The indifference curves intersect at two points: the intersection with higher number of consumers and restaurants is an equilibrium. In an equilibrium both the restaurants and consumers who are in the platform are happy to stay with the given prices, and there are no additional restaurants or consumers who would prefer to join the platform. The other intersection point is a tipping point or critical mass; above that point the platform can start to grow towards the higher equilibrium, below it will shrink towards zero. Zero is the other equilibrium point (no Wolt). See also Figure 21.11. in the CORE The Economy, unit 21.5 https://core-econ.org. Grading based on correctly sloping indifference curves (1 p.) and the explanations (1 p.).

(d) Many had the first point here but only a few the second one (which is admittedly of lesser importance in this particular case). As the question was suggesting, one can consider this as another pricing decision for the platform: The payment to the contractors is a negative charge from the point of view of the platform. In order to be able to make the deliveries, the contractors need to be paid at least their cost. If there is ample supply of labor willing to do the deliveries, then changing the payment above costs does not affect the number of contractors: there will be plenty in any case. (1 p.) Also, as delivering food can be considered to be a low-skill work (and the quality can easily be monitored), it matters little to the restaurants or the users who is doing the deliveries i.e. the externality from the contractors to other sides is weak. Platform pricing theory thus suggests that the contractors do not need to be subsidized, keeping their payments low (1 p.). I have required some notion of the network effects here for full 2 p.

(e) Again, many possible avenues for full points. For example: Easy to both consumers and restaurants to multihome, leading to fiercer competition on both sides. In an attempt to avoid pure price competition, the platforms might want to reach a dominant position by providing a superior product, e.g. through smooth user interface (1 p.) Longer-term there might be differentiation between the selection of restaurants on offer by aiming for exclusive contracts (1 p.).
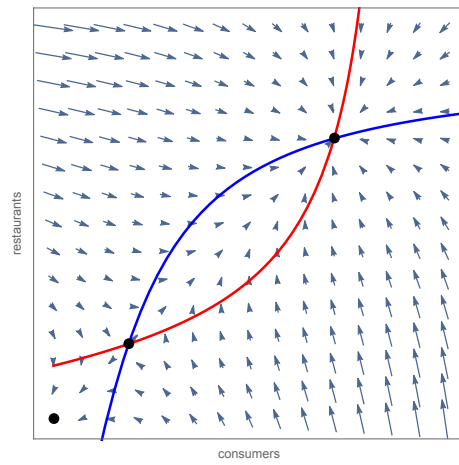
Figure 1: Example of possible indifference curves for Wolt at a given prices.

4. In this question you need to consider a firm and answer the subquestions a to e from the point of that firm. The firm you need to consider depends on your student number: Take the last number (0-9) of your student number. For 0-4 your firm is Netflix, one of the largest providers of digital streaming of movies and TV series, for 5-9 your firm is Spotify, a firm that offers one of the most popular music streaming services.

   (a) Compare your firm to its traditional alternatives, i.e. a delivery of physical goods. What are the efficiency gains from streaming digital content compared to the old business model? (2 p.)

   (b) Explain how a digital streaming company is able to offer all its content as a bundle with a fixed monthly payment but a firm selling individual goods is not (2 p.)

   (c) Two main alternatives of revenue collection for a streaming service are fixed subscription fees and ad supported service. Describe the logic that you would use to determine which model (or both) is better for the firm (2 p.)

   (d) What's the expected impact of competition to the overall quality of service in the market? (2 p.)

   (e) What are the overall welfare impacts of streaming services from the point of view of your firm, its consumers, and the content providers? (2 p.)

   The split was obviously an attempt to make it harder for possible

   (a) *Efficiency gains can result from several channels, for example replicating a CD/DVD is more costly than enabling streaming for one more user (1 p.) and the cost of transporting bits is lower than shipping items in mail or selling them in physical retail stores (1 p.).*

   (b) *Streaming can be priced with a fixed fee because the marginal cost of showing one additional movie/series digitally to an individual is very low. Bundling several non-rival goods to heterogeneous consumers will extract higher rents from consumers than pricing the products individually (1 p.). Physical goods need to be consumed individually. Bundling of thousands/millions of physical items would entitle too high costs (1 p.).*

   (c) *Many possible approaches. ´One can look at the question purely based on the market demand, some people are willing to pay a high price for an ad-free service whereas others are not and could use an ad supported model. (1 p.) If you offer both, then either the price for the ad-free version needs to be low enough or the number of ads high enough to push the high valuation types to the subscription model. (1 p.) The analysis is more complex once you factor in competition (not required here). As anecdotal evidence, Spotify is using both, Netflix only the subscription model. I would assume that they know what they are doing.*

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(d) *Competition between streaming service providers with similar content could result in price competition, but this the firms prefer to avoid as driving prices to marginal cost would mean almost free services (1 p). It is more likely that competition will lead to competition on some other dimension. This could be through the creation of more exclusive content with which the firms can attract/retain consumers, in particular those who are willing to subscribe to only one service. Or it could be higher quality streaming or additional services such as playlists on Spotify or recommendations in Netflix (1 p.)*

(e) *The firms enable more efficient matching and have been able to earn rents on their platforms. The overall effect to consumers is more selection and arguably better quality. (1 p.) The content providers are mixed depending on the platform: In the case of video streaming, the creation of exclusive content and competition between the service providers on the best shows would seem to suggest that at least the most popular content creators are better off. However, in the case of music streaming, an individual content creator has limited impact on the sales of the bundle, leaving them in many cases worse off. (1 p.)*