

### Problem set 5 – Model answers

1. Consider the following platforms. In theory, for which side(s) would it make sense to subsidize the price that the participants pay.

(a) Wolt, a Finnish food delivery company.

*Consumers are more valuable (= impose a stronger externality) to restaurants and have more outside options, making them more price responsive, hence the subsidy (some deliveries are now even “free”). Restaurants are more dependent on consumers, so you can charge them more. Drivers are on the losing side, with current labor market situation no need to compete on them.*

(b) Instagram

*Users more valuable to advertisers. Advertisers harm users, so they need to pay. Instagram partners here aim to make it easier for the advertisers to use Facebook’s (Instagrams’s) platform over competition, so they could be supported by Facebook (I don’t know how the contracts look in actuality, so feel free to try and argue this point if you know better).*

(c) Amazon

*Buyers more valuable to sellers than vice versa, and if there would a fee to buyers, they would have other “free” options making the buyers again more price responsive. Advertisers harm buyers, so they need to pay.*

(d) Apple App Store for iPhone

*Consumers have other choices and they create value to the other side of the platform. The closed system that Apple has enables them to charge relatively high fees from the app developers.*

2. Pricing decisions at an online marketplace.

*All the choices were correct. Sometimes this can make you suspicious, but in theory the questions should have random number of rights and wrongs. In any case, my intention was to have 1 p. for this and 3 p. for the Museum Card question, but I had messed up to points in the system and decided now not to update them (as they might have affected your effort, in theory at least). I did a manual revision and used the rule +0.5 p. for a correct choice and -0.5 p.*

*for a wrong choice.*

*In addition, I've accepted both answer for the question: "A monopoly operator would only be interested in attracting marginal users to the platform, thus distorting the pricing structure." I was after the distortion that results from the fact that the monopoly can only internalize the value marginal users on the other side of the platform place on an additional user joining the platform. This is the "Spence" distortion: similar to when a monopoly in a traditional market needs to choose a quality level of the product, it will think what will sell best to the marginal users. A social planner would be looking after the benefit created on average. But the question can be interpreted so that the monopoly would only be looking to add customers regardless of its profits, which is not the case. Thanks for pointing this out!*

3. Consider the Finnish Museum Card (*Museokortti* in Finnish, see link below). It provides free access to some 300 museums with a fixed annual fee. The participating museums get compensated by the user in proportion to the normal tickets. So if someone with Museum Card visits your museum, you are compensated e.g. by 50 % of the normal ticket price. What are the problems with this pricing model?

*<https://museot.fi/en.php>*

*Apparently several things are problematic, good answers here. Most missed the network effects here though. Note that for some arguments there is a counter-argument that makes the end result ambiguous, you'd need to look data to know which way the end result turns. At least the following points were accepted, and if handed out points if they analyzed and end results made sense.*

1. *In addition to the collection of revenue, admission prices serve a dual role as a means to allocate the scarce resource of museum halls during popular exhibitions. As access with Museum Card is free to subscribers, popular exhibitions can lead to an externality from one user to other, i.e. congestion that is cleared by queueing. Compared to other alternatives of allocating who gets in (e.g. increasing the price, arranging a lottery, awarding by merit like letting liberal arts people in first, or whatever), queueing reduces welfare in many ways, e.g. due to the lost opportunity to do something else than stand in line. If the pricing would be by the visit, then museums could set higher prices for more popular shows to clear the queues.*
2. *Because the payoffs to the museums are tied to the normal price of admis-*

sion, the museums can increase their revenues by increasing the normal admission prices. There is some evidence on this taking place already. Visits to card holders are free in any case, so the higher normal admission prices will only mean that Museum Card needs to compensate more to the museums. This will force the museums either to further lower the compensation percentage or to increase the fixed fee for the Museum Card. The compensation percentage has already been lowered over time. But the museums can respond by increasing the normal price further leading to a slippery slope towards infinite prices / zero compensation in equilibrium.

3. Per visitor, museums receive only part of the revenue that they would for normal admission. Some of the visitors that now use Museum Card would have visited museums in any case even if that means they would have paid the full ticket prices. This is particularly true for the initially more popular museums whose gain in the number of visits is lower than for the initially less popular museums (see also Point number 1). In effect, the Museum Card scheme results in an indirect subsidy from the more popular museums to the less popular ones. Also, the way in which the initially more popular museums can compensate loss in revenue is to increase prices, and then Point 2 applies.<sup>1</sup>
4. One source of the problems above is that Museum Card offers a fixed price for all users. Thereby the ones who value the service most end up paying too little for the service and the card is too expensive for others. Compare with the free-to-play games.
5. One could view the Museum Card as a device for the museums to collude. If many visitors use the card, then the museums have reduced incentives to compete (in regular prices or quality).
6. This is ambiguous: If the prices for consumers are fixed, then the museums can start to compete with quality more fiercely to attract more visitors to their museums. Here then the bigger museums might be in a stronger position. But if the exhibitions are too popular, then Point 1 again applies.
7. This is ambiguous: If the museum market ends up in an equilibrium where most potential domestic museum visitors get the Museum Card and the normal admission prices are very high, then a) less foreign visitors may be willing to pay the higher prices and b) those who still visit are going to bring in more revenues.

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<sup>1</sup>Note that for an individual museum the effect is ambiguous, lower revenues from regulars can be compensated by customers who only visit because of the bundle.

8. *All of the above are based at least loosely on some type of equilibrium argument. But it appears that as Museum Card is still relatively new thing, a large part of their revenues has come from new people subscribing to the service. Slowing growth is then causing problems with compensation payments. Which starts to sound a lot like a Ponzi-scheme.*

*There is an analogy to some digital platforms, like say internet search: marginal cost per visitor for a museum is bound to be quite low and museums would be the type of public good that you'd want people to be able to consume. There is hope that the museum card will end up in some equilibrium that resembles gym cards: People subscribe because they think its good to them and overestimate the times they are going to use the service. Sure, there is sometimes rush (post holidays at the gym), but overall not so much, and the only the types that really want to use the service do. Or it may end up like MoviePass, a failed attempt to offer movie theater seats against a fixed fee.*

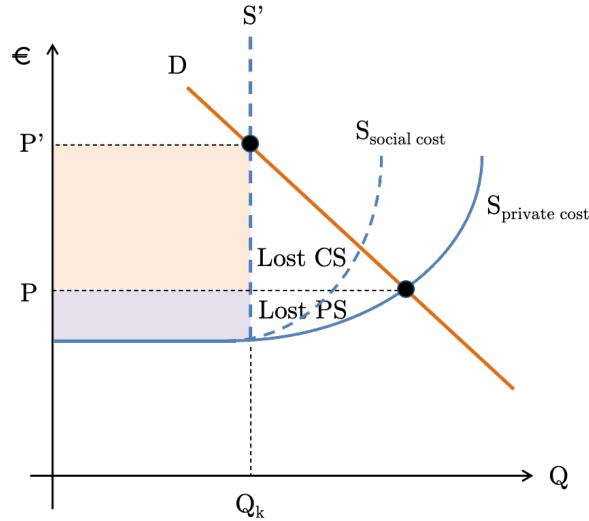
*Finally, the obvious question is that if this is no good, then how should the prices be set? That will depend on the objective, and would make a great topic e.g. for a thesis.*

4. Hotels and AirBnB provide accommodation services to travellers. Consider a market where initially both operate, but then short-term rentals like AirBnB are banned by regulation. You can assume that this does not affect demand (but obviously can affect the quantity demanded).

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- (a) Draw a stylized supply and demand curves in a typical P-Q figure for the initial equilibrium before regulation.

*See Figure above. The Figure is in line with what we had in the lectures with the idea that there is a fixed capacity of hotels providing a capacity  $Q_k$  and then an additional price responsive capacity of AirBnB hosts with increasing cost of supplying to the market. It was enough to have only one demand here (although in detail one could think the hotel market and*



*AirBnB market separately and then define some rate of substitution between the two.) Obviously, the shapes of the curve can differ, but this is a simple way to separate the supply.*

- (b) Add, again in stylized manner, how regulation could change the supply and the equilibrium.

*If the price responsive AirBnB part of the supply is removed, then the new supply is given by the curve  $S'$  above. Here many had used the template from the lectures and got the same as above. However, many seemed to have assumed directly that regulation would have affected all suppliers in the same way, which is not correct. One might argue that if AirBnB is remove, there is also an impact to the competition between the hotels, and less competition would lead to increase price. I did reduce points here, do contact me if you think you had it right.*

- (c) Include in the drawing also any possible deadweight loss that results from regulation in this market.

*Deadweight loss in the accommodation market occurs from two source: First, there are consumers who would have paid more than the original price  $P$  and stayed overnight, but are no longer willing to stay (lost consumer surplus, Lost CS in the Figure). But also there is loss to the producers (lost PS in the Figure), or the AirBnB hosts, who would have earned with the original price  $P$ , but can no longer supply after the regulation is implemented.*

- (d) Describe, shortly, what would be the motivation for implementing such regulation. Does that change the interpretation of your answer in b?

*Mistake here on my part. The question should have referred to c), not b), i.e. how the deadweight loss is defined. As such, this was probably quite confusing question to answer. I ended up approving almost any try here. You mostly gave good reasons for regulation, and we touched these issues then later in Lecture 12. I was after the regulation of externality, i.e. the idea that in addition to the private cost to the AirBnB hosts, one should consider also the possible adverse social impacts of AirBnB activity e.g. to neighbours and housing markets. One way to simply illustrate this is that you can add the social cost to the private costs (see MRU). Then depending on the size of the social cost, regulation may actually be welfare improving: Although regulation leads to the reduction of welfare in the accommodation market it also removes the externality. In the Figure though, there would still be a net loss from regulation even after the externality.*