

starts increasing again. That means the preferences are not single peaked.

b) Condorcet winner is the alternative that beats all the others in pair-wise comparison:

h vs n	h vs m	m vs n
1	1	1
↓	↓	↓
Ⓜ vs. m	Ⓜ vs n	Ⓜ vs n
1	1	1

As we see now, the high containment ~~best~~ measures beats the other alternatives, specially when it is the preferred alternative of 2 groups. So $\frac{2}{3}$ of the people voting voted for this level of containment.

c) To make this preferences single-peaked, we could change the order of the preferences of the type B people to, for example: high levels of containment as ~~the~~ preferred ~~alternative~~ alternative again, but medium levels as second preferred alternative and no containment as the least preferred one.

4. a) As we can see the Behavioural Insights Team ran an online experiment and we can say that they used a randomized trial to discover a way of communicating that best suits the general state of knowledge that we have and WHO stated: there is no evidence that people who had coronavirus will become immune to it. We can say they used randomized trials, because, in this experiment, each individual was randomly assigned to a different way of describing the result. By that, the random assignment ensures that there is no systematic difference between the different groups, since they are identical except for the treatment, and the team measures precisely what they want: the impact that the phrasing can have on the behaviour of the people who know their result and if a positive antibody test result really leads this persons to be a higher risk for the others in society (since we are not sure that someone can ~~turn~~ turn immune to coronavirus). So Randomised Trials are the type of experiment that helps here to test the effects that the phrasing can have on the behaviour of the people and they are randomly assigned ~~sets~~ and divided into different treatment groups (so the probability of a bias is lower).

b) When ~~a~~ individuals are positive tested, which means they have coronavirus, a really contagious ~~for~~ disease/pandemic, they can be a risk to the persons around them and the society in general because the people around them can easily get sick. If they think after getting tested ~~that~~ that they become



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1. a) Condorcet Winner corresponds to the alternative that in a majority voting beats each alternative option, so it emerges as selected alternative in all voting agenda. In this case, the agenda setter (the who decides how voting is going to be done) has no power to change the results of the voting to what he wants it to be, because, no matter the order chosen in the pair-wise comparisons, the society/people will opt for the same alternative and the winner is always going to be the same, the Condorcet winner. It is also important to say that the Condorcet Winner is the alternative chosen by the median voter.

b) Samuelson Rule of optimal public good provision states that it is optimal to ~~pro~~ provide a certain level of a public good when the Marginal Cost is equal to the sum of the marginal valuations ~~\$/~~Willingness to pay of the individuals who benefit/consume the good. So the cost of the public good must correspond to the value that these individuals attach to it.

2. Marginal Benefit = $100 - t$

Marginal Cost = t

$t \rightarrow$ each additional thousand ton of oil

MD = 80

a) Grey Inc. will decide to explore ~~the~~ the quantity when the ~~the~~ Marginal Benefit (MB) is equal to the Marginal Cost (MC):

$MB = MC$ Grey Inc. will decide to explore 50 thousand tons of oil.

$100 - t = t$

$100 = 2t$

$t = 50$

$t = 50$

$t = 50$

b) The social optimal quantity is 10 thousand tons of oil.

Social Marginal Cost = $PMC + MD$
 $= t + 80$

$PMB = SMC$

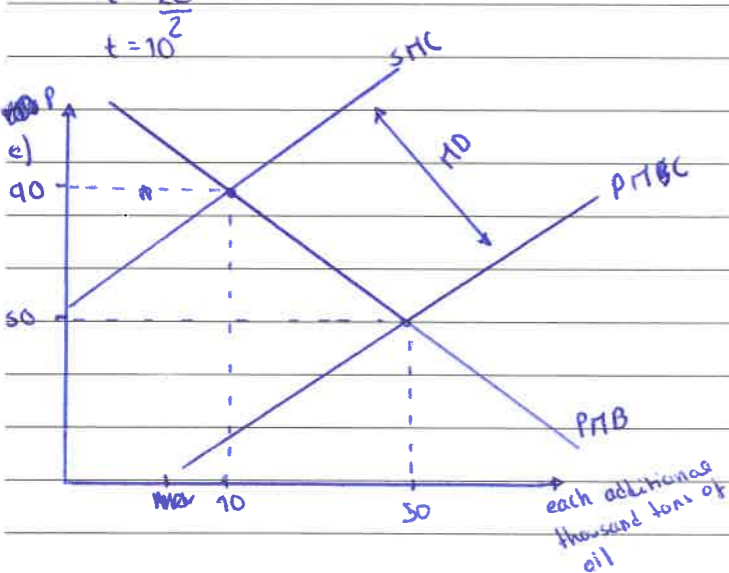
$100 - t = t + 80$

$-t - t = 80 - 100$

$-2t = -20$

$2t = 20$

$t = 10$



Marginal Benefit (private optimum)

$100 - 50 = 50$

Marginal Benefit (social optimum)

$100 - 10 = 90$

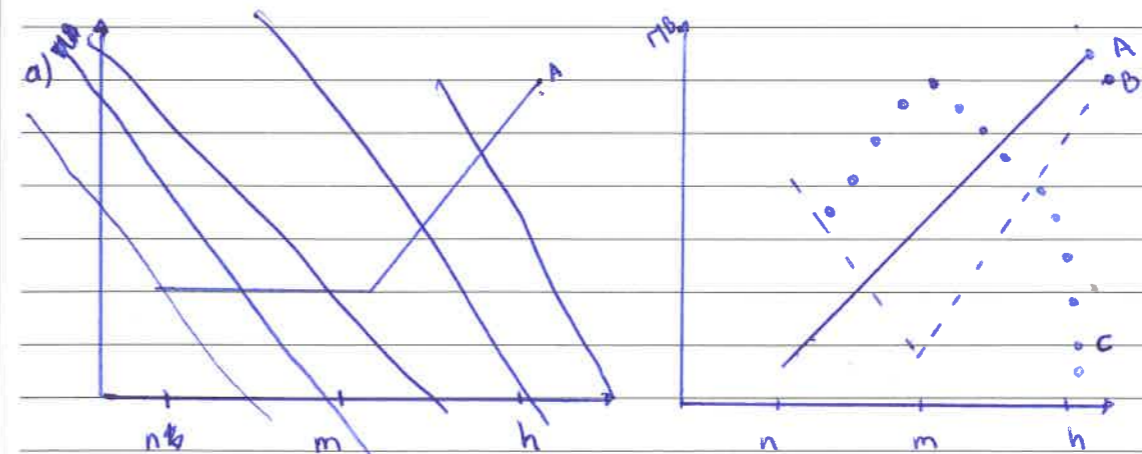
d) When t is equal to 80 it means that ~~the~~ the ^{Private} Marginal Cost is equal to 80 and the Private Marginal Benefit is equal to 20 ($100 - t \Leftrightarrow 100 - 80 \Leftrightarrow 20$) and this is not optimal for Grey Inc. This is because, in this case, the oil driller will have no profit and will need pay more (have more costs) than what he receives which is not optimal at all. If the costs are higher than the benefits ($PMB(20) < PMC(80)$) there will be no revenue and does not ~~make~~ make sense that Grey Inc. produces more than 50 thousand tons of oil, that, as we can see in the graph, is the ~~optimal~~ private optimal quantity when $MB = MC$. So Grey Inc. should not explore more than that, because it will mean: $MB < MC$ (no profit at all), the more he explores, the lower the MB is.

e) $SMC = PMC + MD \rightarrow 80 \rightarrow$ should be the tax $PMC_2 = SMC \rightarrow PMC_1 + MD$

The government should tax Grey Inc., because it imposing ~~also~~ also cost in everyone else and the firm pollutes more than the socially optimal amount of pollution (negative production externality). Because of that, the government should tax 80 ~~per~~ per each thousand tons of oil since that is the Marginal Damage (the extra cost the oil driller is imposing on the others by exploring).

Type	A	B	C
Level	h	h	m
of containment	m	n	n
containment	n	m	h

n → no containment
m → medium levels of containment
h → high levels of containment



As we can see through the graph the preferences are not single peaked ~~since~~ since that means each individual's benefit/payoff decreases when moving away from its preferred alternative. But, in the case of type B, for example, ~~the~~ the benefit of these people decreases when ^{they} move away from their preferred option (high levels of containment) but increases again from medium levels to none. So their benefit that should always decrease when moving away from high levels (h),



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immune forever, when there is no real and certain proof for that, they become a real risk for society. They will probably act in a way that will put the others in risk (for example: they will not self-isolate and continue to act as a person who can't really have the virus, which means if they will probably contract the virus by being overconfident of their condition and infect the others). This, of course, creates a negative externality, because the members of society will have a higher risk of getting sick and will bear a higher cost. By having a overconfident mindset and behaviours that create risks of infecting or getting the virus, the individual is imposing a cost/risk for the rest of society.

e) The preferable way to communicate the results is when the framings are more descriptive and refer to antibody instead of immunity. First, we can conclude that because of what is said: when compared, people whose ^{test} refers to antibody tend to think they still have risks of catching the virus (only 2% think they have zero risk), but those whose ~~test~~ test refers to immunity tend to think more (when compared with the first ones) that they have zero risk of catching the virus again. This happens because antibody test only state whether you have or ever had coronavirus and don't refer that the people that test positive will become immune or if there's any probability of that happening. On the other side, the "immunity tests" just by its phrasing induce people to think that by

having the virus one time they will probably become immune. ~~Here~~ the different phrasings have an impact on the individual's behaviour for sure. The tests framed as an immunity can certainly lead to a overconfidence bias (people think they are immune). Also if the test ~~is more descriptive~~ is more descriptive it will contribute for individuals being more informed and understanding, as WHO states, that there's no evidence of real immunity to the virus.

Through ~~the~~ phrasing it is possible to change and influence people's behaviours, so here's the importance of behavioural insights in this subjects. We can say that through nudges we can influence ~~the~~ behaviours only with small details that seem irrelevant. ~~Message~~

~~Q5.b)~~

Q5.b) In this quote, we see that the most important topic is lobbying by the US bigger technology industries such as Google, Amazon, Facebook, Apple and Microsoft, whose power is enormous. The article refers that these firms spent ~~only~~ \$64m only lobbying policy makers. By that expenditure of resources, time and specially money spent, ~~they~~ they try to influence the policy makers and ~~also~~ also influence the outcome of the politic process to their favour in a way ~~to~~ to maximize their profit, for example. As the spokesman says the more potential regulation is into the industry is on the table, the more money this lobbies are able to spend to fight law against them or that creates more limits and disadvantages, or even to influence investigations or lawsuits against them. ~~With~~ With the power that industries like Google and Amazon, for example, have, they are really able to influence and change the policy ~~making~~ making and its outcomes.

This happens, specially, because politicians also have interest to listen these groups since they can provide them relevant information that they would ~~not~~ not obtain otherwise (about specific policy areas or intensity of preferences) and ~~it~~ it can also be important for their objective of maximizing votes (they can contribute for politician's campaigns and get a lot of people to vote in them). So it is easy for lobbies like this to influence the policymakers. Of course, lobbies can lead ~~politicians~~ ^{politicians} to support socially inefficient positions (benefit only a small group of society and maximize their profits) but they're not necessarily

bad. It is important to say that small groups (like this firms) with large individual interest and well organized are more likely to influence than large groups that suffer from free riding problem.