IN THE COMPETITION APPEAL TRIBUNAL

Case No: 1403/7/7/21

Salisbury Square House
8 Salisbury Square
London EC4Y 8AP

Friday 7th February 2025

Before:
Ben Tidswell
Dr William Bishop
Tim Frazer

(Sitting as a Tribunal in England and Wales)

BETWEEN:

Dr. Rachael Kent **Class Representative**

v

Apple Inc. and Apple Distribution International Ltd **Defendants**

A P P E A R A N C E S

Mark Hoskins KC, Tim Ward KC, Michael Armitage, Matthew Kennedy, Antonia Fitzpatrick, (Instructed by Hausfeld & Co. LLP) On behalf of Dr. Rachael Kent

Marie Demetriou KC, Brian Kennelly KC, Daniel Piccinin KC, Hugo Leith, Hollie Higgins (Instructed by Gibson, Dunn & Crutcher UK LLP) On behalf of Apple Inc. and Apple Distribution International Ltd

Friday, 7 February 2025

(10.30 am)

DR HAL SINGER (continued)

Cross-examination by MR PICCININ (continued)

THE CHAIRMAN: Good morning.

Mr Piccinin, I wonder, is the best starting point to ask Dr Singer about his reflections overnight? Are you happy if we proceed that way?

MR PICCININ: Yes. That was going to be my first question.

A. So there are three issues. I imagine you would like to do them in turn, otherwise it could be kind of long.

Q. Let us do it in turn.

A. So going in order, I think the first one, and I will try to characterise as fairly as I can what I think the criticism was, but the first one was the suggestion that because the demand modelling in equations 14 and 15 --

Q. Dr Singer, just to stop you, shall we get it up on the screen, so that we have got it?

A. You can put it on the screen.

Q. It will help me, anyway. So it is {C2/8/110}.

A. I think I can state the criticism, as I have internalised it, which is that there was a question about whether the demand modelling for equations 14 and 15 -- sorry, 15 and 16, good that we did put it up -- appear not to take into consideration the sell side, the seller side; whereas the objective function faced by the monopoly platform does take into consideration the sell side and the buy side, I hope that is a fair ... and the question is: are you being inconsistent or are you violating the spirit of Rochet and Tirole?

Q. Yes.

A. So the answer is no, and the reason is that what we are doing in 15 and 16 is we are modelling the demand for the app, for the apps, among buyers; right? Now, that is related to, but again it is different than the demand for the platform, the demand faced by the platform. Again, I think that what could be happening here is that, because these two economic activities are happening in parallel, it is easy to conflate the two. But when we go to model the demand for the underlying app itself, that is a function of the app price; okay?

So you can see in that equation, we are asking: what is the relationship from the buyer's perspective of apps, between the price of apps and the demand for apps? That is what that equation is doing.

Now, what is it doing there? We need to parameterise the demand for apps so that we can ultimately get an elasticity for -- from the buyer's perspective, and the elasticity from the buyer's perspective is going to change as we toggle from the actual world into the counterfactual world because the prices are going to change.

Now, why is that? Under the linear demand assumption, as you move along the demand curve for apps as a function of app price, the elasticity of demand is going to change. That is just a property of linear demand functions.

In contrast, we talked yesterday about a constant elasticity function; and so on the supply side, on the developer side, we are using a constant elasticity. So even though the prices are changing as we toggle between the actual world and the counterfactual world, the elasticity of supply from the developer's perspective is going to stay at 0.66.

So it is kind of long, and I am wrapping up, I promise, but the idea here is that the mere fact that we do not take the supply side into consideration when modelling the demand for apps is perfectly fine; and I just -- if there is any doubt about whether we are being true to Rochet and Tirole, and truly taking into consideration the supply side elasticities, you can just watch to see how the supply side elasticity kind of works its way into the prices both for the actual prices and for the but-for prices in the counterfactual world.

Q. Dr Singer, I do not want to spend too long on this,

because we have got other things we need to move on to, but I will just ask you some questions --
A. Absolutely, yes.
Q. -- about that answer, just to make very clear what I have been putting to you. You have just explained that you use the linear demand function to get the demand for apps; yes?
A. Correct.
Q. That is the total number of transactions that takes place in the distribution market. That is how you have done it?
A. Yes.
Q. And that is done exclusively by reference to the buyer side?
A. Yes, when we are modelling the demand for the underlying apps that is an explicit function, right, of the price of the app. In contrast, when we looked at those demands, those complicated demand curves that the platform faces, remember the price that the buyer faces to access the platform is related, it is related, because you have got to go to the platform to get the app. But the price, remember that is a zero price; right?
So remember that these are related but they are different, so there is no tension or conflict between

when we are modelling the demand for the underlying app as a function of the price. I think the criticism was: where is the supply, Dr Singer? Where is the supply elasticity in that equation? Isn't that different from the equation you used in the objective function? It is different, because it is a different demand.

Q. Equations 15 and 16 in this table are giving you the DB function.

A. Excuse me?

Q. Equations 15 and 16 in this table are defining the DB function, the buyer demand function?

A. They are defining the demand for the apps, and it is related. Those parameters and the elasticities that we ultimately derive will inform the DB function, that is true.

Q. But they are the DB function, because then when you go on to -- if we could just scroll down the page.

A. Okay.

Q. When you go on to calculate the buyer side product price elasticity in row 22, so that is the DB function in the counterfactual, you do it by reference to -- you calculate that elasticity by reference to equation 15?

A. Yes.

Q. Yes.

A. Yes. We need those parameters from equation 15. We need those parameters, because we needed to know how the elasticity on the buy side changes as you move from a high price monopoly setting into a lower price competitive setting. So we need those parameters. Yes, they do enter into DB, but we are trying to be as faithful as we can to the Rochet and Tirole model, and this is the way that we did it, you know. Are there other ways potentially to do it? You know, maybe so, but none of your experts ever said: this is the way to do it and when I do it this way, you know, Singer's model changes. No-one ever said that.
Q. I am just going to put the final point to you, because I am not suggesting there is some other way you could have done it that would have worked, what I am suggesting to you is that you have got the total market quantity being equal to DB; whereas your objective function, the profit function, has it being equal to DB times DS and that is an inconsistency.
A. Okay. That is your testimony. I disagree with it, respectfully. If you could ask me another question. None of your experts say that.
Q. Shall we move on to the second one?
A. Yes. The second one is easier, yes.
Q. Okay you.

A. So we can get out of this one faster.

So the second one is: why did I constrain the price from the platform perspective to the buy side to be zero in the counterfactual world when in fact the profit maximising price, when it is unconstrained, might be something other than zero; right?

So I think I have got a very good basis in doing this. Just to be clear what I did, I am constraining that price, the buy side price in the counterfactual world, to be zero, and then I am solving for the profit maximising price on the other side, subject to that constraint. Economists do this all the time as well; constrained optimisation.

You are nodding your head but I am telling you; okay?

The basis for doing that is that Apple, in my opinion, and in Dr Sweeting's opinion, we have an agreement on this, is not going to introduce a new user fee in the but-for world; right? It would go against Apple's core model, in my opinion, and it also -- it would mess up the chance for network effects. You do not want to throw frictions or roadblocks in the way of this beautiful symphony that is taking place, right?

Then finally I just want to tell you, as an interesting aside, we have in other iterations of this model taking that constraint off, we have, and allowed both to be solved simultaneously. I cannot remember what happens when you do that, but it is more of an academic exercise. We could have done that, but we did not think that was the right model of choice.

So that is two.

Q. Dr Singer, and again just very briefly, that does not answer the point that I was putting to you.

A. Oh, I am sorry. I thought your point was --

Q. Let me --

A. -- inconsistent with profit maximisation.

Q. Let me put it to you. You have said that you have imposed an external constraint that Apple will set PB equal to zero for other reasons that come from outside the model.

A. Absolutely, yes; the real world, the real world.

Q. I am not suggesting you are wrong about that. What I am suggesting is that if that is true, then in the actual world you are wrong to assume that PB equals zero was profit maximising within the model, because --

A. No, I fundamentally disagree with that, I am sorry. An economist would never say anything like that; okay? We have to observe that when we see the pricing that Apple makes, if they are choosing zero on the buy side that is the profit maximising price. So it was totally appropriate to calibrate the model under the assumption that zero was profit maximising. I do not know how you could come to any other conclusion. As an economist, as an economist; okay?

Q. Dr Singer, if we need PB equals to zero to be profit maximising then we need that to be true both in the actual and the counterfactual. You cannot have it both ways.

A. I am not having it -- I do not think I am having it both ways.

Let me just try this again. We have to respect that if Apple is choosing zero in the actual world, that that is the profit maximising decision for Apple. Now, when we go to the counterfactual world, we have two options; right? One option is to allow that price to float, to allow the model to solve what the new price is in the but-for world; right? That was one option. We rejected that option. We decided, instead, to constrain the price on the buy side to zero, and then solve for the profit maximising price subject -- on the sell side, subject to that constraint.

I am not having it both ways. I am not doing anything untoward. I do not know what you are suggesting. But these are modelling choices, and, again, if your experts did not like that modelling choice, you know, they are free to put forward alterations to the model and come up with different results.

Q. Okay. We need to move on, again.

On the third point.

A. Yes.

Q. Mr Hoskins yesterday asked for a reference, so I wonder if, just before you give your answer, I will just show you the reference in Sweeting 2. So that is at {C3/7/56}. If you just read paragraph 120 to yourself.

A. Okay.

(Pause)

Yes.

Q. Just to show you everything. Footnote 203.

A. Okay. Can you scroll up just a little, so I can see it? Thanks.

Q. That is why he is saying that you have extended the Rochet and Tirole model to tack on Landes and Posner.

A. Right.

Q. Sorry, just one more. Paragraph 122, which is over the page {C3/7/57}. So this is where he explains why that is inappropriate.

A. Yes, he does. Okay, I have got it, and I have got an answer.

Q. Good.

A. Okay, good. Okay, so the Rochet and Tirole model, when you move from a monopoly platform setting to a competitive platform setting, is calling for a parameter, and it is the new elasticity of demand faced by the incumbent when he is now subject to competition. It is a new parameter that it is calling for, right, and that is the parameter that we want to solve for.

The way that we have modelled it is we went into the literature and we said: what can we find on -- that describes how the elasticity of demand for an incumbent changes in response to entry by competitors? We found the answer, it was in a footnote to Landes and Posner. So to be fair, we are not importing the Landes and Posner dominant fringe firm per se. I know that that may have been suggested in the hot tub. But I think you agreed with me yesterday, the mere fact that we put in a footnote to Landes and Posner does not mean we are incorporating all the aspects of the model.

We traced the footnote through, I think yesterday, and we saw the footnote was to Scherer. I think that predates Landes and Posner by about 30 years. I do not know; he is older, he is older.

When you look into that Scherer thing, you see the seminal equation that tells you how to get at the elasticity of demand for an incumbent firm that is facing competition. So that is the one we used.

I think that there we are using that because -- for analytical tractability, tractability. I think that is the best way I can describe it for you. We need to move forward in the building blocks of the model to run the simulation, I feel like it is a classic assumption, and if Dr Sweeting thinks that we are somehow violating the spirit of Rochet and Tirole because that equation does not allow for competitive strategic interaction, it is a critique, it is a critique, I do not think it is a very forceful one, but it is a way to move forward analytically to get to a solution.

Q. Okay. So let us move on, then.

A. Okay.

Q. Dr Singer, I think you do accept that your model simply assumes that, through some unmodelled process of competition, Apple somehow ends up with a market share of 50%; yes?

A. I think it is -- when you say "unmodelled"?

Q. To be clear about that, what I mean is that the market share just comes from your comparators --

A. Correct, that is fair.

Q. -- it does not come from the model.

A. The major -- you showed me a wonderful passage from the CMA I think yesterday. It said: figure out what the critical inputs are. Unfortunately in this model there are a lot of inputs, but the one that is really driving the outcome, and because there is uncertainty over the inputs, over all the inputs, we have simulated this over a very large range for all of the uncertainty, but the one that is pivotal is the market share; right?
Q. Okay.
A. But this, to me, is fundamental --
Q. Dr Singer, I have not asked you any other questions --
A. Dr Sweeting says: I think that Apple's share could fall to 50% --
Q. Dr Singer --
A. -- and I am saying they could fall to 30%.
Q. -- you've had the debate about that with Ms Demetriou yesterday. We do need to move a bit more quickly. So if you could just answer the questions I am asking you, and if you agree with them, just say yes.
I want to deal with the implications of you taking this approach of taking the market share from outside the model. One of the points Professor Sweeting made in the hot tub is that because you treat market share as an input to this model, the lower the assumed market share, the lower Apple's price comes out; yes?

A. Let me see. Let me just make sure I follow the mechanics.
Yes, the more the share falls, yes, by this model, by the Rochet and Tirole model, yes, the lower the commission, the equilibrium commission is, as predicted by this model. That is fair.
Q. Okay. But it is fairly basic economics; is it not? The lower your price is, the more your market share will be, just holding everything else constant?
A. Yes, but that is not the intuition. I think he said that in the hot tub, and that is also, that is also -- I mean, just parroting it back -- that is not the intuition that is going on here. The intuition that is going on here is that the more potent the competitors are at stealing your share, right, the more aggressive your price response has to be. If the competitors are impotent by contrast, if the competitors only take a few percentage from Apple's 100, then you would not expect Apple to have to drop its commission significantly.
So you are fighting the intuition, but I am telling you that this is the intuition --
Q. All right, Dr Singer. You remember, in relation to the Epic Games Store, how they allow for third party payment processing for the aftermarket services; yes?
A. Epic does, yes.

Q. Yes, and remember you made the point that the reason why they have retained close to 100% market share of that aftermarket is because they charge a low price for the aftermarket services of 12%; yes?
A. It is a reason. I cannot say that is the only reason. But to me, as an economist, it seems to be an important reason, that if you start at a low commission, then you have taken some of the air out of the balloon or you have taken some of the impetus away from driving developers to go and look for ways to consummate transactions off your platform.
Q. So forget the model for a moment. Realistically, if Apple set the price of 15%, say, across both distribution and the aftermarket services, like Epic does --
A. Yes.
Q. -- then you have no basis at all for saying that Apple would lose market share down to 50% --
A. I think --
Q. -- has not.
A. But I think you are confusing the order of operations. So what the model is trying to solve for is a new equilibrium price that would result from this new observed market structure, and if the market structure is more competitive, that is if the entrants steal more

of Apple's share, then Apple's response is going to be a larger one. That is the thrust of the model.
Q. Epic and Microsoft can barely take any share away from Steam when Steam is charging a 27% commission on PC games?
A. So I mean, I think we have to respectfully disagree about the 27; right?
Q. It is going to be a lot more than 15, is it not?
A. They are commanding a premium, they are commanding a premium, I will grant you that, over the 12 to 15. This is assuming that the court -- the 10.7 in the court's order is a typographical error.
But you are asking me, did they -- were they impotent in stealing share away from Steam?
Q. Yes. Even with Steam charging the commission that it does, and even with Epic and Microsoft coming in and charging 12%, still if you just look at Steam versus Epic versus Microsoft, you saw the numbers yesterday, it is like 85/15 or 75/25.
A. I do not think those were the numbers. I think there was big uncertainty over what Epic's share was, do you remember, it was that very large bound. Then Dr Sweeting ... I think we were going back --
Q. That is --
A. -- 39, 39 to --

THE CHAIRMAN: Let him finish the question, please.
A. Okay, sorry.
THE CHAIRMAN: Why do not you finish the question, Dr Singer. I think Mr Piccinin interrupted you.
A. Okay. I appreciate it, I appreciate it. You feel sorry for someone after Day 5, right?
So I think Dr Sweeting has something on the order of 50%, and that was based on his calculation of Steam's post-entry share.
MR PICCININ: All right.
Penultimate point, we are nearly done with the models -- sorry, with this model. We saw yesterday that the model works by assuming that Apple's actual commission is a monopoly price; yes?
A. That is totally fair, that in stage 1 we are calibrating the parameters under the assumption that the 30% that we are observing is consistent with the monopoly. That is totally fair.
Q. You remember yesterday when you and I were debating your HMT, yes?
A. Yes.
Q. You said that you rely on the models as an input to the HMT, yes?
A. In part; I rely on comparative benchmarks and I rely --
Q. The comparators and the models?

A. Yes, and the models.
Q. We debated your use of the comparators, and I said that was circular and flawed. Now we are debating your use of the models --
A. I enjoy it when you say that things are flawed, but yes, go ahead.
Q. Sure. So you are relying on this model -- in that part of your analysis, you are relying on this model to show that Apple's current commission is a monopoly price?
A. Okay. So the model by itself, simply because it is calibrated around 30% under the assumed monopoly, is not necessarily going to produce an output that is materially lower than 30%. That was not by design, that is a function of the law, right?
But I will grant you, I get the circularity argument -- no, hold on -- and I think that it is an argument, it does not have a lot of force for me, but if it applies anywhere, it is with respect to the HMT when they look to the Rochet and Tirole model. But this argument has no force for the HMT as it applies to the comparables.
Q. Yes, we debated that yesterday.
A. Okay, okay.
Q. Okay. I need to move on to the Landes and Posner model, which you used for the aftermarket; yes?

A. Yes.
Q. You modelled that as a one sided market, and I think you accept that this one does use the dominant firm and competitive fringe model; yes?
A. Yes.
Q. But you have said a few times, we can look at the transcript if we need to, that your understanding is that in the dominant firm and competitive fringe model, we can still have Apple, the dominant firm, charging a premium over what the competitive fringe charges?
A. You could. If the fringe comes in at cost, if the fringe charges the competitive rate, you could have a premium. I should tell you that my model is completely agnostic as to what the fringe is charging. The only thing I am using Landes and Posner for is to model the price of Apple. So if -- I do not think that I am --
Q. Dr Singer, you are going beyond the question.
A. No, but I do not think I am putting stricture on what the fringe is charging. You asked me yesterday, or the other day, where do I think the fringe is going? I am telling you, I think the fringe, I think it is perfectly consistent with the model, would be anywhere between, say, 6.5% and the 9.5% that Apple would charge.
Q. Can we please look at {C5/281/1}. Let us start at

page 1 so you can see what it is. It is an article from a journal. I think it might be one that you have cited.

But if we go to {C5/281/3}. Just looking at the first paragraph, they are introducing the history of the dominant firm and competitive fringe model; yes?

A. Sorry, you want me to look at the ...?

Q. If you just read the first paragraph to yourself, perhaps.

A. Oh, the first paragraph. (Pause).

Okay. It is back. I will let you know if it goes away again.

(Pause)

Yes.

Q. So what they are telling us is that the dominant firm/competitive fringe model has five elements to it, five assumptions we need to make. In the first one, you can see that it has to be a homogeneous product industry; yes?

A. Yes, like payment processing, yes.

Q. That means that consumers have to treat every supplier's product as interchangeable. That is what it means?

A. Yes. Well, this is a modelling assumption, but I feel like we are pretty close in payment processing and the associated support services, but go on.

Q. Dr Singer, you just said before that you expect that in the real world, in the counterfactual, Apple would come in at a premium to --

A. I do. I do think, if you really want to probe the recesses, I do think that what the model is telling us -- it only is telling us Apple's price, that is all the model can tell us. But if you are asking me, do I think that Apple would command a premium? I do think they would in reality, and that Apple will be able to enjoy some incumbency advantage and some brand name recognition that would allow them to price, say, a few percentage points above the fringe.

Q. Dr Singer, a "yes" would have done for that question.

A. Okay.

Q. Number 3:

"The members of the competitive fringe behave as price-takers, taking the industry price as given."

This is the point I was putting to you yesterday; that in the Landes and Posner framework there is only one price, the market price.

A. Well, this one says "taking the industry price as given", right? That just means they are going to key off the industry price, that they have no way of affecting the industry price. There is no strategic interaction. I do not know if this is telling us -- is going as far as you want to go, but I also do not even have a problem going as far as you want to go, because my model is agnostic as to what the price is of the fringe.

Q. Dr Singer, what I am putting to you is that the dominant firm/competitive fringe model has everyone charging the same price. That is true for any homogeneous product market?

A. Well, that could be your opinion. I think that there is no restriction. You do not have to have a restriction if they price the same. Economists make innovations to models all the time and they can -- in any setting they could have an incumbent having an advantage. So that is fine. That is your testimony, that is fine.

Q. All right. Dr Singer, the other points that I put to you about the Rochet and Tirole model, specifically I mean your use of the market share as an assumption, and that driving lower prices if it is a lower market share, all of that applies equally to the Landes and Posner model, does it not?

A. Yes, yes.

Q. In that case, we can move on to incidence.

A. Great.

Q. So I need to start by asking you some questions about the evidence you gave when Ms Demetriou was asking you some questions on Tuesday.

A. Sure.

Q. So if we go to {Day16/86:1}, please. You might remember that Ms Demetriou was asking you a question, it was a hypothetical about what would happen if the Google Play Store lowered its commission to developers on the Google Play Store in a world where there are no other -- we are imagining a world in which there are no other Android stores.

You can see at line 12 we get to the last time she put the question to you, which was:

"Question: If the Google Play Store lowered its commission to developers on the Google Play Store, is it your case that those developers would pass on that reduced commission to consumers; yes or no?"

Do you see?

A. Let me just see. 16 through 20?

Q. Sorry, 12 to 15 is the question.

A. 12 to 15.

Q. Then your answer came after that, and what you said is that the incentives to pass on in that scenario are "blunted severely" by the fact that there is no steering because there is just one platform; yes?

A. Yes. If I am getting the hypothetical right, she wants me to assume that Google is a monopoly platform.

Q. Yes, that is right.

A. Yes. On the Android system, yes. Okay, so you do not have steering within the platform.
Q. So the consequence of that is that the incentives to pass on are blunted severely, is what you said.
A. I do think that if you take away that one, you know, it is hard for me to rank which ones are most important, but to me a fundamental mechanism here that has been deprived is the ability to steer by offering a lower price to your user to go to a lower cost platform, and that has gone from her hypothetical.
Q. The other thing you said there is:
The second thing you have done ..."
This is line 21.
"The second thing you have done is you have gotten the direction of the change to be a negative one, whereas we are contemplating what an increase in the commissions did for our counterfactuals."
A. Yes.
Q. Yes?
A. Yes.
Q. But for the delayed counterfactual, looking back to our case, I think you actually agree that a decrease is the right direction; yes?
A. It is complicated, but I am almost with you -- it is almost with you.

Q. Shall we have a look at what you said --
A. I am going to tell you -- if I can, I can tell you my thoughts. I can do it in 15 seconds.
You still are coming below -- the but-for price is coming below the actual price, so in that sense it would be a decrease.
But what I want to -- maybe we can accommodate you, I am trying to find a middle ground here, is that the app developers would have been -- would have calibrated their price around the 30%; and now you are asking them to do something nice, be good by their customers by sharing a portion of the cost savings, so their customer might not even understand.
So that is the reason why I think that that example is, yes, is not ripe and does not capture what we are trying to do in our primary counterfactual. I grant you, of all the counterfactuals, the delayed counterfactual is the one that would come closest to that directionality.
Q. Yes. I mean, in your report, what you said is that the delayed counterfactual is one in which we should be looking for a decrease in commission, because that is what we are looking at, is it not?
A. Well, we are decreasing relative to where we are coming from, but we are -- let us just be fair. We are

increasing relative to where -- to the but-for. So I will leave it at that. It is complicated.
Q. Shall we just have a look at your report, then. So that is {C2/15/117}. If you look at footnote 550, you say:
"This argument [which is the argument about the direction being wrong] does not apply in the delayed counterfactual, where the directionality is the same as Professor Hitt's examples."
Yes?
A. Yes, I say that. That is true.
Q. Okay. If we could just go back to the transcript, where we were, {Day16/86:1}.
A. Okay.
Q. If we just go -- you can see at the very bottom of the page, you say:
"We already know from the experiments that Dr Hitt investigated ..."
Now we are at the top of the next page, and you refer there specifically to the small business program, and you say that that sounds kind of close to Ms Demetriou's hypothetical; yes?
A. Yes, I said that.
Q. Yes, and you said that you would not expect to see a lot of incidence; yes?
A. Fair, yes, I -- I wouldn't ...

Q. So assume for the moment that the Tribunal rejects the exclusionary abuses, the ones that you are concerned with, but finds in favour of Dr Kent's claim on the excessive pricing claim; yes?
A. Well, that is a new one for me. Unfortunately, I am not sure I am following entirely. You want -- you want --
Q. Well, let me lay it out for you. I will just explain why I am doing it, because, you see --
A. Oh, you --
Q. -- Mr Holt relies on your estimates of incidence for his quantification of the damages in the excessive pricing claim, so that is why I need to ask you about it.
A. Well, that is good. I mean, I think mine are the best estimates you can get. But what are we -- what I am confused about is, you want me to assume that they have -- the Tribunal decides that the exclusionary -- both the distribution requirements and the payments are not anti-competitive?
Q. That is right.
A. Yes, I do not have -- I do not have a role at that point, right. There is no --
Q. Only on incidence.
A. What?
Q. Only on incidence do you have a role at that point.
A. Oh.

Q. So at that point, the counterfactual just consists of Apple charging a lower commission on the App Store; yes?
(Pause)
A. Why, may I ask? Why does Apple charge a lower commission ...?
Q. Assume that Mr Holt has -- and Mr Ward and Mr Armitage have persuaded the Tribunal that although the distribution restrictions and the payment restrictions are lawful, Apple is earning too much money, and 30% or 26%, or whatever, is just too high.
A. Okay. I am not sure I totally understand, but the restrictions stay and just Apple is ordered on a going -- ordered, I guess retroactively, to lower the ...
Q. So the counterfactual consists of Apple charging, say, 15 or 20% or whatever --
A. Yes, okay, okay.
Q. -- in the counterfactual; yes?
So in light of your evidence that we have just been looking at, can we just agree that, for that scenario, for the excessive pricing claim, Professor Hitt's analysis of the experiments would be the best evidence of what incidence there would be?
A. This is the first time I am hearing this. It is an interesting question. But if I am understanding it

right, we still are asking whether the inflated commissions caused developers to raise their prices, and so I still think Hitt's experiments are of the wrong direction, respectfully.

Q. It is the wrong direction point, yes. But in the delayed counterfactual --

A. Hold on -- okay, sorry, so now you want me to assume plaintiffs lose on the antitrust grounds on the restrictions, and they also lose on the primary -- oh, okay, the only thing that is left is the delayed counterfactual.

Q. Yes, so assume that one; yes?

A. Yes.

Q. It follows from your evidence that Professor Hitt's experiments are the best evidence.

A. Well, I would have to think about all of the experiments that I looked at. You know, my significantly higher -- let me just -- just bear with me, you know, because I am getting this for the first time. I want to think about all of the experiments that I exploited, like the VAT tax experiment. Is that no longer informative to incidence in the delayed? I do not know why it would not be. That was at 1.33.

So I would have to think about why you would want to disavow a theory of perfect competition, why you would

want to disavow logit and linear, right?
Q. That is what I was wondering, Dr Singer. We have it up here on the page, what you said about exactly the same scenario.
A. No, no, that is a different point. This point, right, is very -- this is pretty straightforward, is that if you create a hypothetical that looks like the real world here, where Apple drops it from 30 to 15% on the small businesses, and you want to know what incidence was in that case, right, you can go and measure it, as Dr Hitt is trying to do; but my point is that that is not reflective of incidence of the kind that we are interested in.
Q. Dr Singer, when Ms Demetriou asked you what would happen if Google cut its commission, your answer was: not much. I am now asking you what would happen if Apple cut its commission, and you are now saying: oh, what about my VAT experiment, what about logit, what about perfect competition? You did not say any of those things when Ms Demetriou asked you. Are you doing it wrong?
A. No, I just have not -- no one has put this question to me before about the delayed counterfactual --
Q. I just showed you. You addressed it in your report. You said the right way to approach the delayed counterfactual, the directionality, is the same as in

Professor Hitt's experiments.
A. Yes, I said that in the footnote, but I am telling you and I said this in the hot tub as well that I think it is complicated, because you are still coming in below the actual. So directionally, you could say it is a reduction relative to the actual, but historically -- right, okay, so we have been through this a few times.
I have never -- no one has ever put the question to me of: what do I think of incidence with the restrictions still on but the delay, I just --
Q. I see. So you had not thought about that until Ms Demetriou put it to you in the Google example on Tuesday?
A. I do not know if those two match each other, but I was giving the best answer, and I still, having looked at the transcript, I think that if that is all that happened in this Google hypothetical, that Google drops its price and keeps the restrictions in, and there is still a monopoly platform, then it is still my testimony that the incidence would be smaller than the incidence that I think would have happened in our but-for world.
Q. Not just smaller; you said that it sounds kind of close to Dr Hitt's SBP experiment.
A. It would be smaller, I am not ready to give you a point estimate, but it would be smaller.

Q. A lot smaller; right?
A. Yes, a lot smaller, sure. You got me --
Q. You would not expect a lot of incidence; yes?
A. Yes. If you take away steering -- if you take away the steering-based incentive, you know, and you insist that Apple retains its monopoly in the but-for world, and you have taken away an important lever by which developers could drive incidence. I feel like I do not -- that has been my opinion. I am sticking with it.
Q. You see, I am struggling. I have a pile of notes here. We can go through logit, we can about go through linear and we can go through perfect competition. But it sounds like you are saying that none of those really matter, it is just the steering story.
A. No, no, no. I think that would be an overstatement. I think that the reason why we do not see a lot of incidence in the actual world is that steering was not available. In contrast, in the but-for world, steering would be available. So at the margin, the ability to steer is going to contribute to --
Q. Sorry, I am not talking about your but-for world, I am talking about Mr Holt's but-for world. In his but-for world there is no steering.
A. I am not that familiar with his but-for world, but you are asking me to assume that Apple is going to retain

its monopoly in that but-for world. I do not even -- to be honest, I do not even understand how to construct a but-for world where the restrictions stay in place. I have never been there before; right? So you are asking me to assume both but-for -- both restrictions remain in place in the but-for world. Everything that I am modelling is removal of the restrictions, so ...

Q. That is fine, Dr Singer. That is fine. I am not going to tear up my notes, though, I think --

A. Do not tear up your notes. Your notes are fantastic.

Q. Let us have a look at Professor Hitt's experiments. I think we can take this reasonably briefly, because I do not think there is any dispute with you about the way he has measured the numbers or conducted his analysis. Is that fair?

A. I did not think it was worth -- I mean, you have heard my responses to Dr Hitt's thing. There are technical criticisms, but I feel like, you know, why not do DID or something like that. But it is okay, they are what they are; right?

Q. Okay. Let us have a look at one and then let us see how we go. So we will start with the SBP, which is the one that you called out on Tuesday; the small business program. If we could go to {C3/4/234}, and so this is where it starts.

Just so that we have the details straight, the SBP was introduced in December 2020; does that sound right?
A. Sure, sure, I see it. Okay.
Q. What it involved was a reduction in the commission from 30% to 15% for participating app developers; yes?
A. Well, you left out the big caveat: who earned less than a million.
Q. That is right. So it was only open to developers who earned less than a million in worldwide revenue during the previous year; yes?
A. Yes.
Q. The developers actually had to opt in to benefit from the program; yes?
A. I believe so, yes, okay.
Q. Very large numbers did so; yes?
A. Of those who were eligible?
Q. I do not mean as a proportion, I just mean that the numbers were big.
A. When you say "big", we know that it barely touched any traffic, but, yes, for those who were eligible they opted in, because why would you not? 15 is much better than 30.
Q. Sure. Tens of thousands; does that sound right? I do not want to give exact numbers.
A. I do not know. I do not know the number.

Q. Okay. Let us go over the page to see what happened {C3/4/235}. We have exhibit 36, if you could focus on that.
A. Okay.
Q. So all this does, it is a very simple piece of analysis, it just shows you what happened to the prices of these products in the six months after they joined the program, that is all. So the first column -- sorry, this is -- the first column, other than product type, if we can just call it that, shows the change in commission rates that applied to the products; yes?
A. Yes.
Q. Those were a very large reduction in commission, as we have discussed; yes?
A. Yes.
Q. Of course, we know, we know, that all of these developers knew about the reduction in commission.
A. Oh, absolutely. I have never taken a position about developers' knowledge, I was talking about the buy side, on the buy side.
Q. You could just say "yes".
A. Oh yes, absolutely, yes.
Q. Because each of them has made a conscious decision to opt in before the six-month period that is being analysed here; yes?

A. Yes.
Q. So it is fair to say that whatever decision they made about how, if at all, to react, it was taken in full knowledge of the change in commission; yes?
A. Oh, absolutely.
Q. Yes. So in the next columns, Professor Hitt has set out what changes in price these developers made during the following six months, and we can see that most of them made no change at all; yes?
A. When you say "most", you have skipped column 2, which is --
Q. I am coming back to it, do not worry.
A. I know, but that is the one you do not like. Okay.
Q. So if we just taken one at a time. 74% make no change at all; yes?
A. Yes, across the three it looks like the weighted -- the average is 73.7%; yes.
Q. Interestingly, the ones -- the categories that had the biggest reduction in commission were the least likely to change their prices.
A. Let me see if that is true. How do you want to establish that? I should also note, this is 2020; right?
Q. So you have got the change in commission rates in the first column, so that is 15, basically; 15, 15, 12; yes?

A. Yes; okay, 15, 15 -- so the biggest ones came in, in 1 and 2.
Q. Yes, and those ones had 73% no change, 82% no change, whereas the ones with the smaller change in commission had only a 50% no change?
A. I see. I should also point out, given this is happening in 2020, right, this is the onset of inflation, and so there are many other reasons that could be contaminating this experiment, right, because if inflation is raging and everyone's prices are going up, you have to be very generous to your customers to give them a discount, because you have enjoyed some cost savings.
Also, I said DID before and I should not use acronyms. This is just looking at -- there is no control group here -- (overspeaking) --
Q. -- not here.
A. -- how they derive, but you could insist that you want to not only see how they change, but how their change compares to the change by the incumbents, the larger apps around the same time who did not get exposed to the experiment. He did not do that, at least here.
Q. Not here he did not do that, no. We are coming to that, because he did do that --
A. Okay.
Q. So you can see that about a quarter of the products

there was a price change, so that is the second column and the -- the column labelled 2 and the column labelled 4 together.
A. Mm-hm.
Q. About the same number decreased as increased; yes?
A. Yes, but again, the increase I think can be explained by the inflationary environment; right?
Q. It is not a causal analysis. All I am saying is that about the same number decreased as increased; yes?
A. I do think it is an attempt to establish causation. So I think that Dr Hitt would say he is ascribing a causation, a causal relationship between the experiment and the pricing.
Q. We can see what he says about it later, but he does actually have a difference-in-difference analysis that we are coming to.
A. Okay.
Q. So -- and that is the right way to look at causation, is it not?
A. No, I -- respectfully, you can do causation this way in a before and after as well; right? You are just attributing -- if you had done this in a regression model, for example, and the right-hand side variable was a one zero for the experiment or the treatment, you would be attributing a causal relationship between the

reduction in the tariff and prices. So I do not know why you say this is not causal.
Q. But the problem with doing that is that, of course, it may well be that these developers would have decreased and increased their prices anyway.
A. I would put it slightly differently, is that there could have been other things, like inflation, that were causing them to want to increase their prices, that are not being controlled for in this table.
Q. Okay. So if we could go to {C3/4/669}. So now we are in appendix 13 to Professor Hitt's report. So we were just talking about the fact that a difference-in-difference analysis is a way that you could look at causation, because you would be controlling for other factors that might have caused people to change their prices; yes? But that is exactly what Professor Hitt does here, in appendix 13. Have you looked at this before?
A. Yes, yes. It has been a very long time, but yes. But I do not know if there are other control variables in the model, such as inflation; but I will grant you that he is using a control group, those who were not subjected to the treatment, to serve as a proxy for how they would have --
Q. Those -- the benefit of doing that is that those people

still will also be subject to the other pressures, like inflation or whatever else is going on in the market; yes?

A. Yes, so it is a classic parallel trends assumption. It is assuming, and I do not think he tested this, if my memory serves --

Q. He did.

A. -- that the parallel trends were not violated or were -- yes, okay.

Q. Yes, he did test for that, yes; does that ring a bell?

A. No, it does not, but that is okay.

Q. We will get to it. This is a standard way to analyse causal effects of an event, is it not?

A. I would say it is standard, and the prior table that you showed me, the before and after, is also standard. There is nothing --

Q. But this is a standard way of doing it, is it not?

A. Yes, it is a standard way, yes.

Q. The advantage it has is that it controls for other things that are going on, besides that --

A. It assumes that the trajectory of price increases of the control group, which in this case would be the large developers, I think the trajectory of their prices over time would be predictive of the trajectory of prices of the mom and pops. That is what -- that is the

fundamental assumption.
Q. Yes. If we -- yes, what we can see here is that he actually looks at three different control groups. One is -- that is just the first column. One is developers who enrolled in the SBP later than the first year; yes? That is the later enrolled developers?
A. Yes, yes.
Q. So these are developers who are likely to be similar businesses to the ones who enrolled in the first year, in that they also meet the same criteria; yes?
A. Yes.
Q. That is a good control group, is it not?
A. It is -- I do not know if I have formulated an opinion on whether that is a good control group.
Q. The second group, the second column, is eligible developers who did not join at all. Again, those are similar to those who did join, in that they also meet the eligibility criteria; yes?
A. Yes.
Q. The third group, who is developers who are not eligible because they had revenue figures that were just above the threshold, and, again, being just above the threshold, they are fairly similar to the group that we are interested in; yes?
A. When you say "just above" -- oh, I think, is this in the

footnote here? 1 million, but less than 1.5?
Q. Globally 1 million revenue, I am told.
A. But not --
Q. So 1 to 1.5, I think it is. If you just look at note 3 in the notes.
A. Yes. Okay.
Q. Okay, so those are fairly similar too; so those are three good control groups, yes?
A. They are three control groups. I will leave it at that.
Q. Okay. They are three control groups that you would expect to exhibit similar patterns of price change, but for the event; yes?
A. Sure.
Q. Again, it is possible to test for that similarity by checking whether they exhibit parallel trends; yes?
A. Yes.
Q. That is another standard approach to doing it?
A. Yes.
Q. I do not want to go through it, but he did actually do that. Let us not go to it just now, but it is at pages 682 to 691. We will be here all day if --
A. Okay, fine.
Q. So if there is a causal link between the commission and price for these developers, we would expect to see tthat the price trends for them would be different; yes?

Different from the control groups?
A. Yes; after the intervention --
Q. After the intervention --
A. -- there would be a deviation in the trends, yes.
Q. So if, for example, the control groups were increasing prices over time during the period because of inflation, but the developers who joined the small business program kept their prices flat, then this difference-in-difference analysis would show that the SBP caused developers who joined it to reduce their prices relative to the control group? That is how it works; yes?
A. Yes, I have to think about this, because inflation did not come about until around the time of the experiment; right? So you have a new confounding factor that gets introduced right after the experiment. That is what is causing me to pause here. I am not sure that the DID is going to properly account for that.
Q. But it is affecting -- this is the point -- it is affecting both the control groups and the treatment group.
A. It is affecting both, but it is not affecting them in the pre-period, that is what I am concerned about. It is a new confounding factor.
Q. Yes, but of course that does not matter, because the

point is that in the pre-period we have got parallel trends, we have checked for that; yes?

A. Well --

Q. Take it from me that we have checked from that.

A. Okay.

Q. Then in the post-period, both of them, both groups, are subject to the inflationary pressures, and so if there was nothing -- if there was no event, you would expect both control groups to react to the new inflation in the same way, because they are similar?

A. Right, but they are both reacting to the new inflation by raising their price. Everyone is raising their price in the inflationary period; right? So we are looking to see if there is an effect of a decrease in the commission, which you know is the wrong direction, in my view, in an environment in which all of your closest competitors are raising their prices. It is almost like the experiment was rigged from the onset not to allow for a price decrease.

Q. But if the commission was having an effect on the SBP developers' pricing decisions, you would expect them to see -- you would expect them to react to inflation by increasing prices by less than the comparators; that is the difference between the treatment group and the control groups?

A. No, no, the -- I am pushing back gently, because if you are looking at how your rivals are pricing -- I mean, there are three things that are pushing away from you giving a price cut here. Number 1 is that your rivals are going up, your closest rivals are going up, because inflation is going up. All things equal, that is pushing your prices up.

The ones who are not eligible for the program, who are literally the price setters in each genre, right, are raising their prices through a combination of their market power and inflation, and you are asking yourself: is this the right time for me to cut prices? It just seems like it is a -- with no incentive possibly to steer to a lower cost platform. I just feel like it is very difficult to find a price, even a relative price decrease in this environment.

I certainly would not be advising -- if I were advising a firm in this environment and all of its rivals were going up, I wouldn't advise them to be the saint and drop price or hold steady.

Q. All right, Dr Singer. Did you just say before, by the way, that all of the big developers had market power? Is that what you said?

A. No, I would say that the ones who -- you can go back, if I ... The ones who are not eligible are the bigs; and if

anyone has the ability to set a price, it would be the bigs.
Q. Yes, okay. You think they do?
A. I have not studied their pricing power explicitly. I have studied concentration, which is very low. But I can acknowledge that there could be a handful of bigs in a category that have some pricing power, sure.
Q. Okay. Just coming back to this, and looking at columns 4 to 6, we can see that the result is quite a stark one. There is not a single negative number in any of those results, is there, across any of the three control groups?
A. Which? Oh, you want me to look at the coefficients in 4, 5 and 6?
Q. Correct.
A. Oh, on price?
Q. Correct.
A. Yes, and this is consistent with the first table you showed me. This is an average effect across everyone who is subjected to the treatment and it is going to be a combination of people who went up and went down and went sideways, but on average, just as you showed me in the prior table, they raised their prices.
Q. Now, Dr Singer, I know that you have your reasons why -- you have just explained why incidence might be low for

this group, or for this group at this time, but this is quite a stark result, is it not? It is an average of zero.

A. No, it is not stark. I think that it might be difficult to interpret what these coefficients mean, but when we looked at the prior table, I think you have the same story, is that -- I cannot remember the number now, 15% of --

Q. 13, I think, yes.

A. -- something in the teens, went down in response to the commission cut; another slug went up and some went sideways, yes.

Q. 13 went down and 13 went up.

A. Okay, yes. That is the experiment we have, and I am telling you, the experiment was almost designed from the start to not allow much incidence, if any. So I mean, it is what it is.

Q. But this was the one that you reached for on Tuesday, and you called out in the evidence we looked at before, to help you answer the question about what would happen if Google cut prices; yes?

A. If Google did something similar here, which is to impose a ... How about this: in an inflationary environment, if Google were to --

Q. We did not have an inflationary environment in the

hypothetical on Tuesday.
A. I know, but I am telling you, I am going to make a stronger statement, that if you -- if Google did the same thing at the same point in time in the inflationary environment, I imagine you would see similar results on the Google platform.
Q. All right. So that is the small business program. Looking at the next one, the other big one, it is the auto-renewing subscriptions.
A. Yes.
Q. If we could go back in this document to {C3/4/240}. So this is one where what the program does is it reduces the commission to 15% for any auto-renewing subscription from the second year of the subscription; yes?
A. Correct.
Q. I think we can agree that subscriptions account for a very substantial share of the App Store commerce, yes?
A. Substantial, yes.
Q. But you make your point -- the point in your reports that the lower commission only cuts in under the first year -- after the first year, sorry.
A. (Laughs) An important difference.
Q. That is a very important difference, I am sorry, and you suggest that developers either cannot or would not want to cut their prices for existing subscribers after the

first year --

A. I think I actually said something a little beyond that, you can straighten me out if I get it wrong, but I think Apple does not give them the mechanics to drop their secondary price.

Q. That is what I meant by "cannot".

A. Well, you did not say "cannot". There is a limitation, yes.

Q. All right. But would you agree with me that any sensible business that sells subscriptions for new customers will want to take into account how long the customer is likely to be subscribing?

A. I think they would like to take it into account. The problem is it is very difficult to know with a new subscriber, who is going to stick and who is not going to go through.

You know, what I think is fundamentally flawed in this analysis, respectfully, is that now you have got a guy who has stuck with you through year 2 and he has basically revealed he is addicted to your stuff, he likes your stuff, and so why would you be -- he has revealed to you a higher willingness to pay, than the average customer that comes through, for the content, and so why would you be so generous to drop your price to that customer?

Then we also have this problem about the mechanics, that Apple does not even allow --

Q. I am not disagreeing with you about the mechanics.

A. Oh good.

Q. The point I am making is that in the expectation that your customers will, on average, stick around for a certain number of years, if the commission is relevant to your price setting decision, then you would want to set a lower price for all customers to get the new ones in the door, so that they will hang around, and you can enjoy the lower commission later, the higher margins?

A. You know, if you treated an economic agent as if he has perfect foresight and make predictions about who is going to stick forward, you know, for years 2 through end(?), you could certainly write down an equation that would try to accommodate this.

In the real world, I do not think that subscribers are behaving this way. I think that they got accustomed to a price that people were willing to pay, that 30% tariff. They were told that they could drop -- they would get some relief in year 2, and they tended not to give relief in year 2.

Q. Can we go to {D1/1047/92}.

(Pause)

That is the wrong reference. We will go to my other one instead. Actually, is that the whole page? I will try my other one. {D1/1078.1/8}

(Pause)

Both my references are not working here.

Sir, I wonder if we could take a ten-minute break now, it has been an hour --

THE CHAIRMAN: Yes, yes.

MR PICCININ: -- and I will just fix those references.

THE CHAIRMAN: How are you going?

MR PICCININ: Yes. I mean, I think I am going to need to go after lunch.

THE CHAIRMAN: Yes.

MR PICCININ: But I think that is workable if I go until 3. At that point, Ms Demetriou will start shouting at me, so ...

THE CHAIRMAN: Yes, and that is it; there is nothing else to come from your side once you have sat down?

MR PICCININ: No.

THE CHAIRMAN: Good, okay. I think, just so everybody is aware, we are likely to have some questions --

MR PICCININ: Oh, I see.

THE CHAIRMAN: -- for Dr Singer, and I think they are likely to take -- they could take a little bit of time, they could take 20 minutes or something like that. We would like to walk through some things with him, just so you know. I am assuming you would prefer we did that after, and then give you an opportunity if either of you want to comment. But if you have a different preference, if you would rather we did it before you re-examined, then we would be happy to do that. But you do not know what they are, so I know that is quite a difficult question.

MR HOSKINS: Sir, I will put my cards on the table. I do not have any re-examination at the moment, so that hopefully helps both of you in terms of timing.

THE CHAIRMAN: Yes, that is helpful. Hopefully whatever we ask is not going to change that either.

MR HOSKINS: I should say, it is not just in my gift, because there may be re-examination on incidence, but that may help --

THE CHAIRMAN: Yes, there is not going to be an awful lot.

So just so that we are clear, and also just so that Dr Singer knows what is coming, what we wanted to do was ask a little bit about the way in which the economic services are provided in this context and we want to really get a sense of who is providing what to whom, and where, therefore, the value arises that might be charged for, and do that without reference necessarily to the way in which Apple has made its business decision to do that.

So the reason for that is, just so that everybody

understands, we just want to make sure we understand what the real economic transactions are here.
A. Sure.
THE CHAIRMAN: It might be quite helpful, I think, if you were able to walk us --
A. Excellent.
THE CHAIRMAN: -- walk you through and see if you agree with where we have got to, and also ask you how useful that analysis is to what we are doing here. So that is what we are thinking of doing at some stage.
A. Great. That sounds fun.
THE CHAIRMAN: I think that might take 20 minutes or so, but it sounds as if we are okay for time.
MR PICCININ: I think so.
THE CHAIRMAN: Good. We will take ten minutes. Thank you.
(11.38 am)
(A short break)
(11.49 am)
MR PICCININ: Yes, I have found my references. I will do one of them, just to save time. It is the same point anyway.
If we can go to {D1/1078.1/36}.
THE CHAIRMAN: I am sorry, just remind us again, so this is a 10-K from when?
MR PICCININ: From Match Group and --

THE CHAIRMAN: You did give us the front page very quickly before, but I cannot remember what year it was.
MR PICCININ: 2020; the fiscal year ended 2020.
If we could just look at the advertising spend section.
A. Okay.
Q. It is really just a short point. Around the middle, you can see there is a sentence that says:
"We spend advertising dollars against an expected lifetime value of a subscriber that is realized over a multi-year period ..."
Yes?
A. Yes.
Q. So it is common and rational for big businesses that do subscriptions to think about their subscriber base in that way, on a lifetime value basis?
A. I think the decision with respect to advertising dollars is probably an easier one than pricing. I mean, here it is a difficult one, because you want to figure out how many of those people who show up are going to stick through the second year and how to recalibrate, if at all.
My point is very simple, that had Apple given these developers the opportunity to reprice the second year, and that experiment may have been fertile ground, but it

is also in the wrong direction, and it is an inflationary environment. So for all those reasons I am having trouble with it.

Q. Okay, we cannot take the debate any further than that.

The other two programmes, the video program and the news program, there are no -- sorry, I should have said, on the ARS there was a diff-in-diff analysis as well, and that led to the same sorts of results as we saw on the SBP program. So I do not think we need to go through it, it is the same type of analysis.

If you have looked at it before and have any quibbles with it?

A. A long time ago, but I think the quibbles would be the same ones that I have already mentioned.

Q. Fine. The news program and the video program do not have the diff-in-diff analysis, because the sample sizes are too small, but they show broadly similar things in that just looking at the simple analysis of what people did, most did not cut their prices.

A. No surprise; and the same thing, you know, wrong direction, still cannot steer, inflationary environment.

Q. But looking across the board at these four programmes, it is right that we have four different scenarios, I know you have concerns about all of them, but they are all pointing in the same direction, which is no material

incidence.
A. I think they tend to point in the same direction.
I think that first table you showed me showed that some people did in fact decrease their price after the, you know, I think 14 or 15%, I cannot remember. You say it is 13, or whatever. But yes, it is a ...
But the average effect, I will grant you, appears to be no -- slight, yes, or zero.
Q. Okay. Let us go to the one natural experiment that you look at, which is the VAT one.
A. Yes.
Q. So if we go to your report {C2/8/140}. You discuss it in 287 to 288. What happened here was that there was a change to EU VAT law which meant that digital -- for digital goods, the VAT of the place of the customer should apply, rather than the VAT of the place of the supplier as it had been before. Does that sound right?
A. Yes.
Q. One effect of that was to increase the VAT on iOS Apps in the UK by 5 percentage points, from 15% to 20%; yes?
A. Yes; consistent with the direction that we go in the but-for world, yes.
Q. Right. We have had that debate, I am not going to come back on it each time you say it.
A. Okay.

Q. Over the page {C2/8/141}, paragraph 289, you say that in response to the change in VAT law, Apple changed its price tiers for the UK, so that app prices in the UK automatically adjusted to pass on the effect of the VAT increase; yes?
A. Do you want to show me that line? Because it was not automatic. Some people did not ride up --
Q. We will come back to that in a minute. But Apple did change the price tiers, did it not?
A. Apple changed the price tiers to accommodate the pinching or the tightening of margins that developers would face in the absence of a price increase. If someone takes a 5% slug of your revenues, it is going to squeeze you, squeeze your margins.
Q. In paragraphs 289 and 290, have a read of them, all you are talking about there are the changes that Apple made to its price tiers?
A. Yes. I can read them again, but if you want to go -- we are in total agreement that Apple is the one who reset the price tiers to accommodate the VAT tax, but there was no requirement that you ride up with that tier. You could stick, you could stand pat, you could go -- we saw developers going above the suggested tier.
Q. We will come back to that.
So you calculate an average incidence of 1.35, this

is at the bottom of 290.
A. That is right. I come in lower than Apple's internal estimate of what they think the incidence was.
Q. Over the page {C2/8/142}, the way you do that is just by calculating the change in each tier. You are not using data here on what developers actually did?
A. Right. Well, this analysis presumes that all developers went along for the ride. This one does, yes. So --
Q. Then --
A. So, yes, if -- to the extent that some did not, and it is true that some did not, then this would tend to overstate the incidence. That is, it would be below 1.33, I think you said.
Q. Okay, if we go on to page {C2/8/144}, there you say that Apple itself calculated an even higher increase; right?
A. Yes.
Q. That too is about the price tiers, is it not?
A. I think it is fair to say that when Apple did its calculation of incidence, and when I did it, the simple -- it is not that simple, you see, because you have to follow, it is a big Excel spreadsheet. But one simplifying assumption is just to assume that each developer rode up the price tier Apple suggested it needed to, to accommodate the VAT.
So yes, we are both doing -- I think we are both

getting at the same analysis, yes.
Q. Then just looking at 292, you acknowledge there that you cannot rule out the possibility that part of the change was motivated by inflationary pressure; yes?
A. Well, I mean, we have a pretty low inflationary environment here in contrast, right, to -- this is 2014-15, so yes. I mean, I will grant you, there are other things that work, just as in every experiment on earth that could be explaining variation in prices. This is a low -- relatively low inflationary environment. This is not the same as looking at a tax or a tariff, you know, that takes effect in the middle of 2020, but yes.
Q. All right. Now, Dr Singer, just a moment ago you talked about having looked at which developers went further and which developers did less.
A. Yes.
Q. You said that in hot tub as well. If we just -- do you remember saying that in the hot tub?
A. I do.
Q. Yes. Now, can you just remind me where that is in your reports?
A. I do not think it is in the reports. I think we did this, we did this in preparation. I cannot tell you the exact date that we did it, but it came up in the -- we

got together, the experts got together for the joint, and we talked about their criticisms and our criticisms. It was not in the joint, I am just telling you where the area sprung. But there was a criticism in the joint that -- something to the extent, we can go back and find it, that this is Apple choosing, and it is just assuming -- the implicit criticism, as I took it, was that it is assuming that everybody rode up with the price.
Q. Let us bring that up just for context, just to help you locate this in time. So that is {C4/7/38}. Sorry, it is line 76.
Yes, here we go. Thank you, 76.
So this is the part where you are discussing that, and you say in the middle of your answer:
"Yes, App Store price tiers are adjusted by Apple. This ignores the fact that iOS App developers can select their price tier and can change at any time."
Yes?
A. Yes.
Q. But you do not go on there, in the joint statement, to say anything about having gone and checked, done any empirical analysis with the data?
A. Correct, and at that time I had not, to be fair.
Q. Right. So this is a new piece of empirical analysis

that you have done since the joint statement; yes?
A. Correct, correct.
Q. Okay. Did you -- I mean, you could have done it. You could have done it right back when you did your second report; yes?
A. Oh, in the second report? No. Because really what happened -- because if memory serves, there was not a chance for me to write a written surrebuttal to the attacks, the criticisms. I do not think that is how it happened, because of the simultaneous submissions, right? This is very different --
Q. Sorry, my question was unclear, Dr Singer.
You could have done it in your original -- your primary report, Singer 2?
A. Well, had I anticipated the criticism, yes, I could have done it.
Q. The criticism is obvious, that it is a decision that is made by Apple, is it not?
A. I do not know if I had that kind of foresight, but that was the criticism, that you are not looking at the responses of the app developers themselves.
We knew, however, and I think we have stated it here, that it was not an automatic write-off; right? I think that is point 1, that is the most important point, and you have had that and my response on that

point, right, at least since the joint report.
Q. But it is empirical analysis that you did.
A. Yes.
Q. Did you share that with Dr Kent and the legal team? Because I have never seen it.
A. I think we -- I think we have shared it, but it is only since the time that we have done that analysis. I think it was in preparing, it was just in preparing for the hot tub and the ...
Q. So it was shared with the legal team; and then our side have been told nothing about it until you just spouted out the results in the hot tub.
A. I think that is fair. There was not an occasion for me to bring it up, but I am happy to turn over that analysis. It is -- whatever.
Q. You see, the problem, Dr Singer, is that it is just impossible for us to deal with it fairly if I do not have it in writing.
A. Okay, I am happy to give it to you in writing, if that is what you want.
Q. Now, let us talk about your idea that developers did not have to ride up with it.
A. Yes.
Q. You understand that the way these price tiers work is that the developer can select one price tier, as in they

select which tier it is; and then that gets rolled out across the whole world, with Apple choosing the corresponding price in each storefront; yes?
A. No, I am not -- it is not my understanding that you are constrained to price the same across the world.
Q. No, but it is certainly one thing you can do, is it not? Pick one country, just pick a tier, and then it gets rolled out automatically across all of the tiers around the rest of the world; yes?
A. Oh, if what you are saying is that there is a program where Apple can make those variations for you, after you elect a tier? Possibly, possibly, so. But developers did not have to go up, and in fact some did not go up.
Q. So they could certainly change their price tier globally. That is certainly what I think they could have done, is it not?
A. Yes, but I do not think it is required that you change globally. I think that you can merely opt, in the UK, to go for a different tier, which is what we have seen certain apps do.
Q. The dataset you are using -- I mean, I am guessing here, because I have never seen it -- but it was the UK transaction data?
A. Fair, yes.
Q. You cannot distinguish between whether what happened was

the developers who made a different -- who made a change were making a global price change for their app or making a UK-specific one?

A. I mean, it is fair I am only getting to see UK transaction data, but what I am seeing is that about 70%, you know, went up with the price hike. I think an equal amount defected and went higher. By memory, something 15, 15.

Q. It seems pretty likely that anything other than just riding up with it was a developer making an unrelated price change on a global basis, does it not?

A. I have not really attempted to ascribe a motive for why you would defy the price increase. I do not think it is necessary. I think the only point I am trying to make is that you had discretion, that is all I am trying to make, is that you did not have to go up.

You know, Dr Hitt's position is that this is all being driven by Apple, it does not reflect the preferences or the decisions of the developers, and I respectfully disagree. You did not have to go along with the program.

Q. I mean, the likelihood is that developers are not going to make country by country decisions on the whole for every country in the world. They leave dealing with things like VAT to Apple. That is the point.

A. Respectfully, I would think if you have a unique tax that just hits you -- an ad valorem tax, just like the commission, that just hits you and gets raised in the UK, that that would only affect your decision-making in the UK.

Q. We will have to agree to disagree on that, Dr Singer.

We will move on to steering.

A. Yes.

Q. So steering, as we have discussed, is only relevant to the counterfactual to the exclusionary abuses; yes? Perhaps you have not thought about the excessive pricing --

A. No, I do not really understand excessive pricing, but I can tell you what ... Steering is not possible in a world where Apple is the only platform in the iOS space.

Q. So the idea is that developers may want to offer lower prices on competing app marketplaces where those competing app marketplaces offer them lower commissions than Apple does; yes?

A. Right; but not because they are, you know, wonderful people, it is because they want to induce the customer to transact on a -- they want to achieve and lock in the savings that they cannot currently achieve when everyone is going to the high cost.

Q. Okay. So if we just go to {C4/7/19}. Actually, if we go back to the page we were at a moment ago, and just go up one {C4/7/30}.

(Pause)

A. Which number?

Q. 75 at the bottom. You are giving the reason you have already given for why the natural experiments are no good; and your second paragraph, you are saying that:

"Unlike in the counterfactual, in the real-world Apple is still the only sales channel available. Therefore, any incidence driven from steering customers to lower priced platforms cannot be observed in these real-world examples."

Yes?

A. Yes.

Q. Then you give a cross-reference to Singer 3, which is your reply report; yes?

A. Yes, I do.

Q. You do not give a cross-reference to Singer 2 which was your main report?

A. There are -- we are at thousands of footnotes now. If I left off a cross-reference, I apologise.

Q. I do not think you did, Dr Singer. I think you did a thorough job of finding all the places where you talked about steering in the context of incidence.

A. I will let my staff know that, but I -- this was, you know, this was the best that we could do.
Q. I have done a word-search of your main report, Singer 2, for "steer" or "steering", and the last page it appears is, let us go to it, {C2/8/101}. Footnote 421. This is in the models. It is long before you get to incidence.
I want to be super fair to you, so I am going to show you one other thing. So if we go to {C2/8/135} in this document.
A. Of Singer 2?
Q. Yes.
A. Okay.
Q. Paragraph 277. You do refer there to the Spotify decision.
A. Okay.
Q. You do not talk about that as a steering point, all you are saying is that Spotify increased their price to pass on the commission.
A. Well, the EC has done an analysis of Spotify's incidence, yes.
Q. Yes, but you are not making a point about steering here.
A. No.
Q. No. So you did not actually -- you now say it is the pivotal or the lynchpin or most important aspect of your case theory on incidence, but it is not in your first

report.

A. I think that "pivotal" might be strong. If I used that word, and I do not think I did, but I was saying it is an important reason that needs to be around in the but-for world and that -- hold on -- when we look at experiments without -- you know, where Apple stays as the monopoly platform, we are not going to see, we should not expect to see, as much incidence as we otherwise would.

I feel like it is a contributor, it is a very important contributor; right? I do not know if I said "pivotal" before, but it is a very important contributor.

Q. It is not in your principal report.

A. Okay. So the quibble here is that it is in Singer 3 but not Singer 2?

Q. No.

A. Okay, quibble accepted.

Q. The further quibble --

A. Okay. Better than a flaw!

Q. -- is that in neither of them have you embarked on any systematic study of the extent to which steering takes place when you have competing app stores with different commissions.

A. Well, the two most natural places to go looking, and of course the only place that I can look here, right, would be in the Apple system where steering is prohibited. So you are telling me I have failed to study steering in an environment where steering is disallowed. I mean, yes, I --

Q. You have not gone to look at PC apps, for example, where there are multiple platforms, and you could have looked at steered prevalence there?

A. I think that I have looked -- where I have looked, I do not know how deeply I could get into the weeds, but where I have looked, and where Dr Hitt I think has looked too, is we looked at where certain large developers who have got brand recognition could potentially drive transactions to their own website at lower cost.

I mean, this Netflix example that Dr Hitt likes to bring up is a great example. Netflix wanted to evade the tax; right?

Q. Okay. Well, we will get on to that.

The one piece of analysis you have got in your reports is in Singer 4, which was in November, which was after the joint economic statement. If we just go to that {C2/17/6}, and paragraph 9.

A. Okay.

Q. Just to remind everyone: this was your report which was responding to the new analysis in the joint economic expert statement; but this paragraph was not responding to anything, there was nothing about steering that you were responding to, there was no new analysis Professor Hitt had done about steering. So this was just gratuitous new evidence from you.

What you say in the middle is that if Apple charges 30%, and the rival iOS App marketplaces charge 10%, then you say the best way to induce iOS device users to use the lower cost app store is to split the savings from the lower commission; yes?

A. Yes.

Q. The premise here is that Apple is still charging 30% in the counterfactual.

A. I think on day 1 they might be charging 30%; right? This is an equilibrium that we are solving for, which is, you know, how do competitive forces, once unleashed, compel Apple to drop its commission down to something closer to the competitive level?

Q. But the incentive to steer, if there is one, is only going to be there while there is a differential between --

A. That is fair, that is fair. So the story, if you want to know the -- I think this came up also in the hot tub. The story is that it is the -- there is a differential on day 1 and that differential gets whittled away, in part, through steering and the threat of steering, and then we settle down on an equilibrium price; right? That is what the models are trying to get at.

Q. Once we get to that point, steering becomes irrelevant to the pricing decision of developers?

A. I think -- I think I might -- let me just see if I am with you on that one. Once we get to -- hold on. No, I have agreed to a lot of things that you have said.

Once we -- once competition drives Apple to a commission that is competitive or near competitive, small, a small premium, then the incentive to steer is diminished, for sure.

Q. Then we are back in the world of the debate of all of the other pieces of evidence about incidence, you know, your logit models, perfect competition, versus Professor Hitt's natural experiments.

A. Yes.

Q. So steering is only relevant while there is a differential?

A. I think the reason why I am bringing up steering is twofold. One is I want to explain why these experiments that Dr Hitt likes to look at are problematic; right? There is no chance for -- no incentive or chance for an app to steer in that environment, or monopoly -- where

Apple maintains the monopoly. But I am also bringing it up because it is an important insight as to how the competitive forces work to discipline -- (overspeaking) --

Q. I think we are quite a long way past my question now, Dr Singer.

A. Oh, sorry.

Q. If we could come back to this now. We have had our little detour and now we are coming back to what you are saying here.

In the last two lines, what you say is:

"Experimental studies show that the typical splits of proceeds from bargain are 50-50."

A. Yes.

Q. We can see from footnote 21 that what you are looking at is the ultimatum game, yes?

A. Yes.

Q. I am hoping we can whip through what the ultimatum game is and just agree with each other about it, yes? It is a classic, is it not? It is the game in which there are two players; yes?

A. Yes, and in which --

Q. I will put the questions to you and then let us see if you can agree with them, and then you can give me an A-plus at the end.

It is a game in which there are two players and they are told they have to bargain over a sum of money, let us call it $10; yes?
A. Yes.
Q. The structure of the game is that the first player, who is traditionally called the proposer, makes a "take it or leave it" offer to the second player, who is traditionally called the responder; yes?
A. Yes.
Q. For example, the proposer could propose that the proposer keeps $9 and the responder gets just $1. That is --
A. He could be even meaner. He could say 9.99, which is what the answer is on the blackboard when you write it up.
Q. Exactly. Exactly right. So the game -- the way the game continues after that. So the proposer does not just get to write 9.99 and that is it, the proposer writes 9.99 and then the responder gets to choose whether to accept or reject.
A. Yes.
Q. If they reject, then no one gets anything?
A. Yes.
Q. That is right.
A. Yes.

Q. If they accept, then the split is 9.99 to 1 cent.
A. Yes, which is -- which is what economists, when they model perfectly rational parties, they reason that the receiver will take the offer, even though it is patently unfair, because a penny is better than zero.
Q. Exactly.
A. But it turns out when you conduct these experiments in the real world, the split is much closer to 50-50, because --
Q. That is right --
A. -- we are human and we care about things like fairness, you know, that the economic models cannot take into consideration.
Q. Yes. So that is exactly what John Harsanyi said in the paper you cited: the dominant strategy, the profit maximising approach, if you like, would be to set 9.99.
Then when you refer to the experimental results doing something different, just to be clear what we mean by experiments, what we mean is that economists have run around mostly, but not exclusively, university campuses, and they play these games with mostly undergrads with real money; yes?
A. Yes.
Q. What the experimental results -- I mean, sometimes they do it with different types of field subjects and in

other countries and it has been done a lot. But what the studies show is that proposers actually often offer something that is much less than 9.99; as in offer -- they do not want to offer a lot more than --
A. They are a lot more generous than the economic actor that is written up on the blackboard. They are more generous, yes.
Q. Then what we also see is that for the people who behave like Harsanyi said people would behave, what often happens is that the responder rejects it, takes nothing.
A. Out of spite, yes. Out of spite, yes.
Q. Exactly. We see a range of different results but with some kind of split; yes?
A. Correct. There tends to be a split, and the split is on the order of 50-50, because humans, unlike economic actors on the blackboard, have these notions of fairness, and that tends to bring us to more even splits.
Q. But that has just got nothing to do with -- it is very different from a scenario where a developer is choosing prices for apps on two competing app stores.
A. I think it has a lot to do with it. Look, I will grant you that the developer/consumer relationship is much more complicated, as in any relationship in the real world; right? But the insight of the splitting of the

benefits is fundamental; right? Because what the developer can say is that -- and I go back to my simple example of a £2 saving, right, on a £10 sword. Look, £2 is huge, it is going to hugely affect my margins if you are going to allow me to escape this taxation. Let us think about a lower priced sword on a lower cost platform.

I am not -- I think it is very reasonable to suggest that it is not out of the goodness of the heart. They are trying to induce something that is painful for the customer, which is: oh my God, I have to change the way that I have been behaving for the past five years. I am going to follow you; but I am only going to follow you and transact on this other platform if I can get a break.

So the question is: will they provide a split to the savings or will they provide zero? I think they will provide a split. I am not taking a position on what the exact split would be, but if there is any split -- I think Professor Hitt comes back and says: no, it is not 50, it is 60/40. I think he misses the point. If there is any split, right, then we will have pass-through under steering-based incidence.

Q. Dr Singer, the choice that a consumer faces when deciding whether to download, I do not know, Minecraft from the App Store or from a competing marketplace on iOS, that is a very different choice, a very different situation, from -- let us say they are the same price or only very slightly different, but it is a very different situation from the ultimatum game where you are facing someone who has just said: you can have a cent and I am going to keep 9.99.

A. Oh, is it very different? I mean, they are both splitting a benefit that can only be achievable if they both go along; right? That is the kernel. That is the core aspect. But is there a dynamic aspect in the real world? I will grant you. Is it repeat? I will grant you. Economists can write down really complicated models to capture all the nuances in the real world.

But at its core, I am just trying to get you to accept or at least contemplate the notion that if you allow me to escape this £2 tax differential, I will be good by you. I am not going to keep it all myself, I will give you a portion of the savings. That is it. That is --

Q. There is no spite option, "spite" is the word you used before, for the respondent. There is no spite option for the consumer if what they do is they buy it on the higher priced platform.

A. That is spite. That is exactly spite; right? If

I could have saved you £2 but I continue -- you know, if I have two credit cards in my wallet and I know which one charges a lot more, I do not have to give their name out, how do you feel about, when you go to a merchant, and you know you are going to take 4% away from them as opposed to 3? You will be inflicting some pain.

Q. When we move away from those university campus experiments and we look at the real world of app developers actually making decisions, what we actually see, where they have competing platforms with different commissions, is a very messy picture, is it not, even --

A. I would say we do not have a lot of good experiments. The two major platforms here are monopolised, right? So what some apps do, if their brand is big enough, is they offer lower prices to consummate the transaction on their website, and we found examples of those. But we are not going to find examples of steering-based incidence in iOS, given the anti-steering restriction and the monopoly, and we are not going to find examples on the Play Store, given Google's monopoly and its anti-steering provisions. So I do not know where you want me to go looking.

Q. Okay. Can we go looking in {D1/1804.1/144}.

This is from the expert report of Valve in the litigation that you were discussing with Ms Demetriou

yesterday.
A. Yes, okay.
Q. I do not know if we settled on a pronunciation of Dr Chiou?
A. That is fine.
Q. You can see the heading at the bottom:
"Publishers do not necessarily charge lower prices on platforms with lower revenue shares."
The reason I am going to this evidence is that this is evidence from a case where the issue was raised in a more orderly fashion, not just coming up in reply and then post-joint statement reports; but if you could just read from over the page --
A. Okay.
Q. If you just read 299 to 300 to yourself {D1/1804.1/145}.
A. Let us just hold steady, if that is okay. Okay, I am on 300 now. The "PMFN" is "most favourite nation" clause?
Q. Yes.
A. Good.
Q. I should provide you with some context.
A. No, that is all right. Hold on.
Q. You understand.
A. I know what an MFN is.
Q. The context was that in the Valve litigation, it was said that there was some kind of MFN that Steam was

operating.

A. An MFN, yes.

Q. A most favoured nation clause.

A. Yes.

Q. So what Dr Chiou was trying to do was to try and find examples of developers who publish their games on different platforms, where they are not on Steam, so they are not going to be caught by Steam's MFN, so we can see what happens when you have got different commissions.

So if you just read those and then I will ask you some questions.

A. Okay.

Q. Let me know when you get to the bottom, because then we can go over the page.

Sorry, 299 and 300, just to be clear.

A. Oh, you want me to go up to 299, okay.

Q. I hope it is on the page.

A. Yes.

Q. Are you ready?

A. I'm almost, so I'm just getting the stats now.

TRIBUNAL: We haven't had the end of 300.

MR PICCININ: That's why I was asking if Dr Singer had got to ...

DR SINGER: Okay.

(Pause)

Okay.

Q. Go over the page and read the last little bit of it {D1/1804.1/146}.

Then if we could just have a look at that chart, so we can see the whole of Exhibit 20.

What we can see, we are talking about one developer here, Ubisoft, they are a developer who has lots of games; yes?

A. Yes.

Q. What we are looking at is games that Ubisoft has not put on Steam but has put on both the Epic Games Store and Ubisoft's own platform, own website, effectively; yes?

A. Yes.

Q. What we can see is that some games are cheaper on Epic, and some games are cheaper on Ubisoft's website; yes?

A. Yes.

Q. So even for a single developer, it is not the case that they will always charge a lower price on the lower cost platform; yes?

A. Yes.

Q. Sometimes they will charge a higher price on the lower priced platform?

A. Well, I mean, for this anecdote, yes. But we -- you know, we found anecdotes that move in another direction.

That is why I did not want to base my answer --

Q. The picture is messy. Let us go over the page and look at 303, shall we? {D1/1804.1/147}. Have a read of that.

A. Okay. 303?

Q. Yes.

A. Okay.

(Pause)

Ah. Okay.

Q. Have you read it now?

A. I am almost there, but I think -- I just wanted to focus on one thing. Okay.

(Pause)

Yes. I think that here -- I mean, can I tell you what I think is going on? This experiment, you know, is looking at EGS -- sorry, you ask the question.

Q. Okay. So what she is referring to is an analysis of 41 games that are on both the Epic Games Store and on consoles; yes?

A. Well, there is a really critical attribute here, which is the EGS exclusive games, and I am curious if in the prior page --

Q. Yes --

A. -- on the prior page, those Uni -- I forget the name of the outfit.

Q. Ubisoft.
A. Ubisoft. Were these EGS exclusive? This is important.
Q. The important point is that they --
A. I will give you the important point, which is that to be an EGS exclusive, you probably had to do a wonderful deal, in terms of pricing, to get on the Epic system. So now you are looking for even lower prices outside? So that would make -- that would seem to undermine the example as well.
So right from the bat, I would say that this experiment is not as compelling as an economist would set up a proper experiment.
Q. Okay. Let us take it more slowly. It may be that I am befuddled, but I think you are actually; we will see.
So she is looking at the 41 games that are on both the Epic Games Store and also on the console stores; yes?
A. Yes, but they are EGS exclusive games. That is, EGS is not competing with any other --
Q. PC.
A. -- PC; right? The question is: how did they get an exclusive? If the answer is that the reason why they got the exclusive was, as part of the agreement, was that they were going to go with a low price, charge a low price or earn a low margin --

Q. Dr Singer, just to clarify. Who do you think is giving exclusivity to whom? It is the developer giving exclusivity to Epic Games Store.
A. Correct.
Q. So the developer does not need to offer Epic Games Store anything. What it is offering is exclusivity?
A. No, but as part of the exclusivity, that means that you cannot get it on any other -- on any other PC console, and that could --
Q. Sorry, on any other PC ...?
A. PC console and that --
Q. Sorry, PC ...?
A. PC game distribution platform.
Q. So you cannot get it on Steam?
A. Or on Microsoft.
Q. Or on Microsoft. But you can get it on consoles?
A. Yes, but then what we are trying to do is -- and then she is doing a comparison with the price on the console; right? The problem there is that we are asking the user to move outside of the platform to enjoy the price reduction, to enjoy the price reduction -- take advantage of these cost savings to ignite the savings and the split to the proceeds. I have always been of the position that steering -- if it is going to happen, if steering-based incidence is going to happen, it is

more likely to happen on the same platform.

If you are asking a customer to follow you to an entirely different platform, which is now I think what you are telling me, to go to the console, then the steering is harder, because now that the split, the split of the proceeds are harder, you are inflicting a new cost on your customer.

Q. The thing is, everyone who has got a console has a desktop, has a PC as well, do they not?

A. No.

Q. Just about?

A. A game console?

Q. Everyone who has a game console is going to have a PC as well?

A. I do not think so.

Q. Okay.

A. Respectfully.

Q. Let us put that point to one side. It is still the case that she finds that five were cheaper on Epic Games Store, but eight were cheaper on the console.

A. Yes, and the console is charging -- oh --

Q. 30%.

A. -- they are charging higher, yes.

Q. Not just higher; they are charging 30%.

A. So I do not understand where she is even looking for steering here. I mean, the experiment would be two -- let me say the proper experiment -- two games that are on the same platform, say Epic and Steam. You have got to ignore the Steam MFN which conflates and confuses things, but I am going to take the Steam MFN away; all right? Then we'd look to see if the ones -- the same games that are on Epic are priced lower by the developer to induce steering towards Epic. That is what we would be looking for. But it seems like the Steam MFN prevents that.

So again, we go back to this problem, again you are saying: Dr Singer, why do not you find me episodes of this? Every place we turn, the experiment is thwarted by some incumbents.

Q. Let us take it in stages. On the previous page, we were looking at an example of -- on the same platform, those were the Ubisoft games --

A. No, but it is not the same. It is not the same; right? Because this is asking the user to go to the Ubisoft website.

Q. Yes.

A. Yes.

Q. Instead of the Epic Games Store, both on their PC?

A. Both on their PC, that is true.

Q. So it is the same platform. You talk about PC as

a platform.
A. Okay. That is fair.
Q. So that is an example of what you could have done.
A. That is fair. That is fair, yes.
Q. What it showed was a -- it did not show any systematic steering.
A. Right. It was not systematic, you are right. It was four out of seven and seven out of 11.
Q. Some down, some up.
A. Yes, correct.
Q. So very similar to the pattern in Professor Hitt's experiments where some, after the commission gets reduced, go up, and some go down?
A. But that is looking at a different thing, okay.
Q. All right. I understand why you do not like the idea that you could steer from PCs to consoles or vice versa.
A. It is hard.
Q. I understand that. I disagree with it, but I do not want to have that debate with you any further.
What I do want to ask you about, though, is, putting steering to one side, why is -- why are eight developers making their game cheaper on a store that charges 30% than on a store that charges 12%? If everything else you say about incidence is true, about perfect competition, about logit, about linear, we are coming to

those. But if all of that is true, why on earth is the price lower on a console?

A. The price could be lower for a myriad of reasons. You could be targeting a different customer base, playing the games on a console as opposed to a PC. You could be competing against different rivals who are charging different prices. The prices could generally be higher on consoles. Who knows why it is.

That is why it is difficult -- it is difficult to take an anecdote based on seven -- sorry, 11 or 40 observations and say: here is what the lesson is from steering. There is no -- you know, you want to conclude there is no steering-based incentive to ...

Q. Dr Singer, this is much -- this is much better and closer evidence to the facts that we are talking about than the ultimatum game being played in the --

A. Unfortunately, it is not, because for every anecdote that you can find like this, we can find anecdotes where the price on the website is lower, we can find ten for every one -- and we did not want to have that debate, we did not think the argument through the: who can compile the most anecdotes, would be very effective.

Q. You did not have to do it anecdotally; you could have done it systematically.

A. We could not, for the reasons I just told you. In the

Steam thing, where the experiment is thwarted because of the MFN, and your expert ignored that, and then in, I have told you, the Playstation -- the Play Store is contaminated because of the monopoly and the anti-steering rules. The Apple Store is contaminated for the same reason. So I do not know where you want me to go looking for evidence of steering-based incidence.

Q. You could have done the same kind of work that Dr Chiou did by looking at games that are not available on Steam and are available on Epic or Microsoft.

A. Yes, and she had a sample size of 11. Had I come into this court and said: I am going to say something about steering based on a sample size of 11, we would have been here for half an hour. You would have called that a flaw.

Q. Dr Singer, this was a pre-certification report. You are turning up to a trial and your client is asking this Tribunal to award billions of pounds in damages. You are not restricted to just her sample size of 11. You could have done the work. You could have -- Ubisoft is one publisher, why not look at the other publishers?

A. Yes, because we chose to prove incidence in other ways.

Q. You chose to prove it -- on this steering point, you chose to prove it with the experimental studies of kids on university campuses, and you chose to do that in your fourth report which came after the joint statement.

A. I think the -- that citation comes in the fourth report, but the notion of steering-based incidence has been around at least since Singer 3 and was also in the joint report, so there is no -- you cannot suggest -- whatever --

Q. In your reply report, which Professor Hitt had no opportunity to respond to, other than in the joint statement.

A. Well, he did, he did. That is not true. We got together. Dr Hitt came over to my office, we sat down in a chair, we went through each of these things, and we debated the points together. Well after Singer 3.

Q. Dr Singer, I hope we can agree that even if you are right that some developers, and I do not think you can really put it any higher than "some" now, can you; some developers would in principle be inclined to choose to offer lower prices on a substantially lower priced marketplace. From a damages perspective, that would only be relevant to the proportion of the commerce that would actually go through that lower priced marketplace; yes?

A. Are we speaking only about steering-based now?

Q. Yes.

A. You know, steering is one pillar, it is not --

Q. -- I am talking about steering, Dr Singer.
A. But I am not offering an incidence that is based entirely on steering.
Q. I am going to attack your other pillars. We are coming to them.
A. Okay.
Q. Looking at the steering one now, because I do not want you to come back and knock the other ones and say: what about steering, Mr Piccinin, you know?
A. I am not going to do that. Listen, steering would create a powerful incentive in the but-for world. We did not get to see it in this world, because this world is constrained not to allow steering-based.
Q. Dr Singer, you are not answering my question. My question is that from a damages perspective, steering, to the extent that it would happen, is only relevant to the proportion of commerce that would go through the alternative app marketplace in the counterfactual.
A. I have not thought about how to do damages under steering-based incidence alone, but it sounds like what you are asking me is to model on the fly a brand new counterfactual on which everything stays the same but we are moving anti-steering restriction.
Q. No.
A. Right? How would I have done incidence and damages in

that world?

Q. No --

A. Hold on, let me finish. But we did not do that. I was asked to remove the payment restrictions, right, and the payment restrictions removes both the tie and the anti-steering.

So I feel like it is a bit unfair to say: how would you have done just the anti-steering? I have never been asked to decompose damages that way.

Q. It has nothing to do with the anti-steering rules, Dr Singer. What I am putting to you is suppose that the Tribunal is with me, is with Professor Hitt, that in general developers do not pass on the commission cost; and then the Tribunal is with you that there is an important footnote to that, which is: what about steering? Okay? So that is one possibility. The Tribunal might find in our favour on your logit and your linear and your perfect competition and your VAT, that is all junk, and that Professor Hitt is right to be looking at the natural experiments, at the general picture. But it might be with you that for steering, well, maybe some developers would steer sometimes; right? So that is where I am now.

In that world, then in the counterfactual to the exclusionary abuses, yes, the steering-based incidence

would only be relevant to the proportion of commerce that goes through alternative marketplaces that have substantially lower commissions than Apple's?
A. Oh, on the iOS?
Q. Yes.
A. So under this -- respectfully, it is a fairly tortured scenario, but under this scenario, I would advise the Tribunal that the incentives, the incentives to do it would be strong. As to what proportion do it, I would say all -- the default would be that almost all would at least try. That would be my economic surmise.
Q. All developers --
A. If we could move from 30 to 10 on the same platform, not encumbered by any exclusives and not encumbered by any other frictions, MFNs or otherwise --
Q. That is not the question I am asking you.
A. -- my economic answer would be almost all.
Q. That is not the question I am asking you. I am not asking you what proportion of developers would choose to steer. That is a question -- we have had that debate. That is why I am showing you all of this. We have had that debate. The question I am asking you now is assume that some proportion of them do; let us assume, for the sake of argument, it is a high proportion.
A. Yes.

Q. From a damages perspective, it is only relevant to the portion of commerce where the users actually chose to transact on the alternative marketplace; yes?
A. No, I would disagree. Can I explain why?
Q. Yes.
A. Because if I am right, then what would happen is that Apple would respond to the lower commissions by attackers, in the but-for world, by reducing its own commission, and that should feed through to lower prices for apps and in-app purchases.
So it does not depend, if I understood your question correctly, that consumers vote with their feet by leaving Apple. It does not in any way.
Q. But the ones who do not vote with their feet, the ones who stay on Apple, they pay the app price that is on the App Store; yes?
A. But what you are not allowing for is that it only takes the marginal customers to move away and to trigger this wonderful competitive interaction, such that the customer -- the inframarginal who sticks around gets to enjoy the fruits of the competition.
Q. What -- we have to take it slightly more slowly, then. Let us say you are right about those dynamics, so the threat or the actuality of some consumers voting with their feet and going to the alternative app store causes

Apple to drop its commission; yes?
A. Yes.
Q. Now, that is a benefit to the developers. Why are the developers reducing their price on the app store?
A. No, because the way to start that cycle is that we start off with the disparity in the commission. The developers say: hey, come with me, I have got a savings that I want to share with you. That kicks off the cycle that we talked about, Apple responds, and in the equilibrium we get to lower commissions and lower prices across the board.
Q. But why is anyone cutting their prices on the App Store?
A. I would agree with you that once we get to the new equilibrium --
Q. At all? Why does anyone ever -- even at the beginning of the story. Let us start at the beginning. So you have got the disparity; yes?
A. Yes.
Q. Someone -- all of the developers are steering; yes?
A. Yes.
Q. They are splitting the difference; yes? So some consumers might want to vote with their feet; yes?
A. Yes.
Q. If they do that, then they enjoy the lower price on the alternative app store; yes? The people who remain on

the app store are still paying the app store price.
A. Yes, they are still paying the app store price, but I'm suggesting to you it would be lower. That is the point of these models. We figured out the extent to which competition drives Apple's commission down, and how that, in turn, would cause app prices to the lower on the App Store.
Q. No, because it only causes app prices to be lower on the App Store if there is incidence, and that is the debate we are having.
A. Yes, and there will be incidence. I feel like maybe we have --
Q. Only because of your logit and linear and perfect competition. There will not be steering-based incidence on the App Store?
A. No, but App Store customers would benefit from the competitive forces that are unleashed through steering. Apple would have to drop its commission and then a developer would have no reason to try to steer, once we get to a new equilibrium, we get lower commissions and lower prices across the board.
Q. They would have no incentive to cut their -- if I am right about the logit and the linear and all of that stuff, the non-steering part of the incidence debate, then they would have no incentive to cut their price on

the App Store in response to a reduction in commission on the App Store?
A. I disagree. If Apple has come down and met the competitive commission rate, and they are both at 10 or they are both at -- why would you punish Apple any longer? You might as well let Apple customers enjoy the competitive price.
Q. It is not punishing Apple, it is --
A. No, it is. That is what steering is and that is what you do not understand. If Apple wants to come in at 20 percentage points above the competitive rate, we will try to punish them by offering a lower price. This is why all these companies, Steam, Apple, Google, Amex, American Express, Amazon is being sued for its MFN. They do not want the merchants on their platform to offer a lower price outside the platform, because they are terrified that there would be a giant sucking sound. So they get all the merchants, in this case developers, to sign up and say: we promise we will never offer a lower price outside the platform.
Q. Dr Singer, I am going to try this one more time, because I feel like you ought to be able to get it.
A. Respectfully, I get it. I do not think you get it.
Q. Okay. Let us --
THE CHAIRMAN: Mr Piccinin, by all means try it again.

I think we understand what you are saying. I think we understand what Dr Singer is saying. I do not -- by all means try it again, but I think we are getting the message from both of you, the point, and I think we can make up our minds about what is right and what is wrong.

MR PICCININ: Fair enough. Let us move on to economic theory, then.

A. Okay, good.

Q. So in the hot tub the other day, I do not want to go back to it, but I think you had three economic theory points. One was that if market -- if app markets are approximately perfectly competitive, I know you are saying approximately, then pass-on would be 100% or thereabouts; yes?

A. As a matter -- as a matter of basic theory, yes.

Q. The second one was your logit demand model which predicts -- which you say predicts that pass-on would be roughly 90%; yes?

A. I think it is 92, but yes, okay.

Q. Can we call it 90%, just for argument's sake?

A. Well, but I am actually --

Q. Every little counts, okay. 92.

A. I just want to be accurate.

Q. All right. Let us be accurate. 92.

The third one was linear demand, which you say

predicted a 50% pass-on rate.
A. Actually, you are conflating. Just to be clear, I have four pillars, I think, for near 100 and two pillars for near 50; right? So now you have gone down to the other thing, but that is fine.
Q. I am grouping these ones together.
A. Oh, you are regrouping, okay.
Q. So these ones do not have anything to do with steering which we have already debated; yes?
A. Which ones do not have anything to do with steering?
Q. The perfect competition and the logit and the linear.
A. Well, they do not require steering but they are perfectly consistent with steering.
Q. They are not models of anyone's incentive to steer?
A. They are not looking at steering in particular. They are thinking about the incidence generally.
Q. Okay. All three of those theoretical ideas predict the same outcomes, whether costs are -- the same pass-on rates, whether costs are increasing or decreasing; yes?
A. Correct.
Q. So your reliance on them is inconsistent with what you said on Tuesday about the Google Play Store example?
A. No.
Q. No?
A. No.

Q. Well, I do not want to go over that again.
A. Okay, all right.
Q. I have put it to you.
Let us deal with perfect competition first.
A. Okay.
Q. If you go to {D2/811/99}. So this is from -- sorry, I should have told you what it was from; it is Principles of Economics, it is Professor Mankiw's book.
A. Okay.
Q. Right at the bottom, I think we have a definition of "perfectly competitive"; yes? Do you see that the bottom paragraph?
A. Yes.
Q. So there are two criteria. I just want to give you a health warning before I ask my question. I am not about to put to you that everything needs to be literally perfectly competitive, but I am just identifying what the concept is.
A. Okay.
Q. The two criteria; one of them is that the goods are all exactly the same; yes?
A. Yes.
Q. I mean, that is what Professor Mankiw says, and that is true?
A. Yes.

Q. That is sometimes what we refer to as homogeneous product competition, yes?
A. Yes.
Q. The other criterion is that the buyers and sellers are so numerous that no single buyer or seller has any influence over the market price; yes?
A. Yes.
Q. Over the page, at the top {D2/811/100}. So because buyers and sellers in perfectly competitive markets must accept the price that the market determines, the price that the market determines, they are said to be price takers; yes?
A. Yes.
Q. At the market price, the single market price, buyers can buy all they want and sellers can sell all they want; yes?
A. Yes. Yes.
Q. That is what a perfectly competitive market is?
A. Yes.
Q. Now, leaving Professor Mankiw's world and coming to the world of apps on the App Store. Even within genres, like the genre of games, apps are obviously highly differentiated products, are they not?
A. I will grant they are not homogeneous. They are differentiated. I will grant you that.

Q. They are nowhere near homogeneous, are they?
A. I have never -- I will give you, they are not homogeneous. Nowhere near? It depends upon which pairing of apps or games we are talking about.
Q. Yes, so -- thank you, Dr Singer. That was really quite imprecise of me. What I am saying is that the proposition that all games in the game genre are the same is nowhere near to being correct, because there are large differences between large pairings of -- large numbers of pairings of games, yes?
A. Yes. In the game category, I think you are picking one that might be unique in one regard, but in games I will grant you that you have differentiated, differentiated products. In some other categories, I think the products can be closer.
(Pause)
Q. Lifestyle, to take another category; thanks to those behind me, would have dating and real estate, for example?
A. Yes. I think that, you know, there are probably some dating apps that are fairly close. I missed that; I got ...
Q. But not close to real estate?
A. Not close to real estate, yes.
Q. Thank you. So we are not in anything like the world of

perfect competition, are we?
A. Well, on concentration, we are. So I would submit to you, and I said in the hot tub, that most, if not nearly all, developers within a category, within a genre, are price takers. When we look at the shares of the developers within a category, we see that they tend to have less than 1% there; what an economist would refer to as atomistic, which means they would not have price-setting power. They would be taking the market price as the model of perfect competition contemplates.
Q. All right. Dr Singer, there are two criteria. I will take them in stages. I am coming on to concentration.
THE CHAIRMAN: Mr Piccinin, you did not make that clear. You asked a much more general question. If you want Dr Singer to --
MR PICCININ: That is fair.
THE CHAIRMAN: -- the point, you need to make it plain.
MR PICCININ: That is fair, sorry. I had not thought that through properly. That is a very fair point.
Because of the point that I just put to you about product differentiation, because of that point specifically, the first criterion for perfect competition is nowhere near satisfied?
A. I do not think we could go out today and find any market that is going to perfectly satisfy the conditions as you

draw them up on a blackboard of perfect competition; right? It is hard for me to think of one.

Q. That is because it is not a very useful model for predicting incidence in markets like this one?

A. It is the most -- it is the most common model. If you look at any authority on incidence, incidence literature, there is a big literature on tax incidence, tariff incidence. The assumptions of perfect competition are broadly employed and this is where all of the economic textbooks begin with the model of perfect competitions. It actually -- it may not be true on Earth, but it provides insights that economists make use of. If you are going to teach an econ 101 class, you start here, with the supply and demand and the market price.

Q. Okay. You remember, though, Ms Demetriou showed you, and perhaps we can look at it again, if you like, but the -- that the commerce on the App Store is extremely concentrated on the developer side? Shall we look at it?

A. No, no, no. She showed me that 0.3% of buyers, buyers -- that is very different from a concentration in the seller concentration that I am looking at.

Q. Maybe that is right. Shall we then go to {C3/8/95}?

Maybe she did not show you this. No, Ms Demetriou,

I think she did. I tend to believe her.
A. Okay.
Q. This is on the developer side. Of course she did. I remember this. The commerce is extremely concentrated on the developer side, is it not? Very small numbers of developers account for very large shares of the commerce?
A. Yes, but that does not make the market concentrated. We have looked at the concentration in the market and --
Q. Now --
A. No, let me just finish, and when you -- my 8% comes out of a weighted average just of the market shares; right? So that is telling you that, even when you weight with the biggest, the weighted average is an 8% market share. When you unweight, right, the weighted -- the average falls below 1%. So I just, I reject the notion that these markets are concentrated the way that an antitrust economist would think about them, in terms of HHI and concentration.
Q. I am going to come on to that.
A. Okay, but this does not refute that.
Q. I am not going to read out anything that is on the page. I am just going to ask you about some developers, whether they are on the page or not.
A. Okay.

Q. Just thinking about whether some big developers who are out there in the world are price takers in perfectly competitive markets, ish, or not.
Do you think Tinder is anything like a price -- a price taker in a perfectly competitive market?
A. Well, you are going to go with the bigs, and so I allow for the possibility that the biggest ones in the category -- and Tinder, of course, went around and bought up a bunch of its competitors. But, yes -- or the Match, I guess the Match Group is the mothership; yes?
Q. That is right.
A. So that would be one of these developers. If you list them all, at the very top, I will grant you some of them will have pricing power.
Q. So the big ones are nowhere near being perfectly competitive?
A. The big ones have a modicum -- I will grant you that the biggest ones in the category have a modicum of pricing power, yes.
Q. Those ones, not the one we are talking about specifically, but the big ones are where all the commerce in this case is. That is what we are seeing on the page in front of us?
A. We have revenue weighted our shares and so what happens,

right, is that the bigs, for the logit model, are going to have the smallest incidence; right? They are going to absorb the shock. So if a big, say, has 50%, I do not know if that exists in any category, but just to make the math easy, then he is going to absorb 50% of the cost increase. I will leave it there.
Q. But the problem with that, Dr Singer, is that those concentrations, as you have said a few times, are being done on a genre basis?
A. Yes.
Q. You are lumping together all games in a single category.
A. Okay. I am going with Apple's categorisations. When I compute my shares, I am doing it within an Apple designated categorisation.
Q. But those are not -- I mean, Apple does not say that those are anything like the relevant antitrust market?
A. No, and I am not neither. I have not listed them as relevant antitrust markets.
Q. No. So in that case, those concentration figures are just meaningless?
A. They are not meaningless. I mean, if I may, Apple has come up with 28-odd categories for how you can market yourself to their customers. Then developers select, once they have given that array, how they want to appear. So if you are searching a given genre, you

know, you can -- you can elect, as a developer, which genre you will appear in.

What we have done is we have calculated the shares on a revenue basis within each genre by developer; and we have found that the concentration ratios are very, very low. The average developer within a genre has something less than 1%. I admit there are some big ones. But when we take the weighted average, revenue weighted average, we get to an 8% market share, which leads to a 92% incidence under the logit model.

Q. Dr Singer, if we apply your hypothetical monopolist test that we discussed yesterday to all of the apps within these categories, like the different games, we would probably find that each and every one of them was a monopolist in its own market, would we not? The prices are way more than 5 to 10% above?

A. Above what?

Q. From each other. So the way -- we talked about this yesterday. The way you do your HMT is you take someone who is alleged to be a monopolist and you compare their price with the price of someone else who is said to be competitive.

A. It is actually not how you do it. So following the CMA's guidance, we begin with a focal product that flows from the challenged conduct. None of these guys have been challenged to do anything, to my knowledge. We say: if someone possessed only those assets that are implicated by the challenged conduct, could they exercise market power? So I do not think that my HMT has any predictions of what would happen in any other market.

Q. It is just funny, Dr Singer, because you put a flight simulator game in the same market as a puzzle game or a shooter game; yes?

A. I mean, I do not; Apple does. Apple is the one who designs the categories. I have taken revenue shares within the categories.

Q. Within the categories?

A. Yes.

Q. You are treating them as though they were antitrust product markets?

A. I am not. I am not, really. I am just trying to figure out how big a given developer is within its genre; as defined by Apple.

Q. You are presenting them as market shares. You are arguing that --

A. Hold on, hold on. We -- can I respond? We see estimates of market shares in the newspaper, daily. Those reporters do not have an antitrust market share in their mind. They are just reporting the shares in a given industry, yes. So you can calculate a share within an industry, without having an antitrust market in your head.

Q. I agree with that, Dr Singer. But if you then want to make the additional point, that because those market shares are low, it implies that they are close to perfectly competitive; well, that does rely on the market being properly defined.

A. I disagree. I disagree.

Q. But will you accept that the -- I think you maybe already have, but that the big game developers will earn significant gross margins?

A. I can accept that they will earn big gross margins, yes.

Q. Okay. So most of the commerce, looking at this page again, is going through developers who must be earning very significant gross margins?

A. You know, I have not studied the margins from the developers' perspective. I know that they incur marginal cost, so not all of the revenues are falling to the bottom line. But this Exhibit 4, without disclosing what it says, is obviously mixing across genres to get the bars as high as they are.

But I will grant you that some of the biggest developers have -- could have a modicum of pricing power. I will leave it at that.

Q. A modicum of pricing power, did you say?
A. Yes, yes.
Q. Shall we go to {D1/304/1}?
THE CHAIRMAN: How are you doing for time?
MR PICCININ: Perhaps I can just finish this point; and then we will be done. Sorry, not done, but done for lunch.
THE CHAIRMAN: Yes.
MR PICCININ: Sorry, {D1/304.1/1}.
It is the King Digital Entertainment form 10-K. We will see the relevant year in a moment.
If we go to {D1/304.1/122}.
So you can see -- sorry, King makes Candy Crush; right?
A. Okay.
Q. This is back in 2014. A revenue of $2.3 billion; yes?
A. Okay.
Q. The cost of revenue is 700 million or so; yes?
A. Sorry. Oh yes, I see it, yes.
Q. So the gross margin then is about 70%?
A. I am sorry. Is that on this sheet, or are you just calculating that?
Q. No, I am just doing the division. The gross margin is the revenue minus the cost of revenue, divided by the revenue.
A. Okay.

Q. Then that cost of revenue, if we just go to {D1/304.1/142}, down at the bottom; the cost of revenue seems to be mostly the payments made to the distribution partners, like Apple and Google and all of the other platforms that you have been --
A. Yes. At that 30% tax, that is the biggest cost of revenue for these guys. They have other marginal costs but yes, that is the biggest for sure.
Q. So their gross margin, over their costs that are actually marginal costs per unit, must be astronomical, then.
A. I think that there -- for the bigs, they are enjoying a healthy margin, yes.
Q. Yes. So those guys, the big ones, that account for most of the commerce on the App Store, are not well described at all by a perfect competition model?
A. I do not think you can look at particular actors within an industry and say: that actor is perfect competition. That is not how you describe it. We are trying to characterise what competition is like across the thousands of developers who could be in a given category. So there, we want to look at industry concentration and we have done that as a share of revenues. We thought that was the best way to capture the representative for the average developer. You like

to take me always to the biggest, and there is some informational content in the biggest; but that does not describe the competitive circumstances fairly in the market, in my view.

MR PICCININ: Okay. Sir, that probably is a convenient moment.

THE CHAIRMAN: Okay. We will resume at 2 o'clock.

(1.04 pm)

(The short adjournment)

(2.00 pm)

(Proceedings delayed)

(2.04 pm)

MR PICCININ: Good afternoon. We are on the home stretch, moving on to the linear and logit models in particular, so this should be fun.

If we could start with {C4/7/34}, please.

We have proposition 84. Just looking at your answer, you accept in the first sentence of your answer there that the linear and logit models that you use predict different incidence rates depending on whether the commission is being modelled as a per unit charge or an ad valorem charge; yes?

A. Yes, I -- let me see. I think everything is fine. Yes, there is a difference, I agree with him. For a monopoly, in a monopoly case, as you toggle between

per unit and an ad valorem tax, you can get different levels of pass-through.
Q. In the logit case it is not monopoly we are talking about, it is a differentiated product, is it not?
A. In the logit case, I am thinking about his appendix where he toggles --
Q. Shall we look at it? That makes it easier.
A. Where he toggles between unit, he is always assuming a monopolist.
Q. If we go to {C3/8/232}.
This one is linear, and the relevant equation for the ad valorem case is equation 12 at the bottom.
A. Right. Yes, for a firm -- just to be clear what the assumptions are -- for a firm that is facing a downward-sloping --
Q. Correct. This is the linear one.
A. Yes.
Q. It is the same model you used in order to get the 50% pass-through rate. What he is saying is that in the same world as you are, if you toggle it to ad valorem then equation 12 is the formula instead.
A. Fair, fair, fair, yes.
MR FRAZER: What are we looking at?
MR PICCININ: This is Professor Hitt's Appendix 3 that Dr Singer was referring to. Sorry, I should have said

that. It is Hitt 3.
You can see that the pass-through rate is proportional to marginal cost; yes?
A. Yes. You have an extra term under -- if we can call it a monopoly assumption. I mean, it could be any firm facing a downward-sloping demand curve, but for the monopoly assumption the incidence formula becomes much more complicated and, indeed, intractable, because it includes a marginal cost component, and we are very rarely going to be able to observe the marginal cost of all actors in the economy, particularly the developers here.
Q. Okay. So I think we can agree, though, that as marginal cost approaches zero, the pass-through rate also approaches zero?
A. Under this formulation?
Q. Yes.
A. Let us see. Yes, the numerator goes to zero, yes.
Q. Too easy.
If we go on to {C3/8/237}. You can see equation 32 at the bottom. So this one is for the logit case. Likewise, this is the ad valorem pass-on formula for your logit model with, yes, ad valorem costs, yes.
A. Let me see, one second.
Q. There as well, it is proportional to marginal cost; yes?

A. That is right, that is right.
Q. That is true even as SJ -- so that is the market share for firm J in the app -- even as that goes to zero, still the pass-on rate is proportional to marginal cost?
A. For this formula, yes, yes.
Q. For your logit model; yes?
A. Well, it is for his logit model. This is not the formula that I am using, but yes, it is his variant, yes.
Q. It is your demand function, and what it is showing is what the pass-through formula would be in your model if we model the commission as an ad valorem fee?
A. Correct.
Q. It is an ad valorem fee?
A. Yes.
Q. So this is the right formula to use?
A. We can quibble about that, yes.
Q. Sorry; was that a yes?
A. No, I said we can quibble about that.
Q. If the commission is an ad valorem charge, and if it is right to use logit to model the pass-through rate, then we should model it as it is, which is an ad valorem charge?
A. No, and so here is the -- this is my side of that debate, that there is recognition in the economics

literature that when industries are competitive, perfectly competitive being the ideal that is never achieved on earth, that there is no difference in pass-through between ad valorem and per unit.

My second -- let me just get this out, I will be very quick. My second is just from a practical perspective, tractability is important; right? If we quite literally were to use a pass-through formula that depended on the marginal cost of every developer, we would go nowhere. We would never get to observe what the marginal cost is of each and every developer.

So even starting with that, I mean, it is -- by design, it is almost rigged for us to go nowhere.

Q. Okay. Just on your first point, Dr Singer; your first point was that under perfect competition, ad valorem and per unit costs that pass through in the same way and fully, that is ...?

A. Yes.

Q. Yes. So we are only into this if you are wrong about that. So I should have been clearer --

A. Let me strike that. Not "and fully", sorry.

Let me tell you. There is a literature in the incidence from sales taxes or tariffs that suggest that in the -- under perfect competition, that one could take the ratios, you might be familiar with those, of the

elasticity of supply and demand --
Q. (Overspeaking - inaudible)
A. We are not always going to get 100%.
Q. You are right.
A. Sometimes I am right. We can still be friends.
Q. You are right. But if we are not in a perfect competition world -- sorry, I should have made clear the premise of my question, which was, we have already discussed perfect competition, suppose I have won and we are not in the perfect competition world, then this is, subject to your practicability point, logically the right formula to use for logit?
A. I think that it is -- one could argue this is the right one, but I worry that we are not going to get anywhere if our formula requires marginal cost as an input to the estimation. I think that mine is a reasonable approximation.
Q. Okay. But if marginal cost is close to zero, then yours is not a reasonable approximation?
A. No, I disagree.
Q. Because as marginal cost goes close to zero, this pass-through rate goes close to zero?
A. Under this formulation, yes. Under this formulation, I grant you, marginal cost goes to zero. Under my formulation, marginal cost does not enter into the

formula, you know, minus one, minus the share.

Q. I know, but yours depends on the commission being a per unit charge which it is not?

A. It is not a per unit charge, correct.

Q. Your formula does depend on it being a per unit charge?

A. It depends on me being allowed to use an approximation which the literature says is appropriate when the markets are reasonably competitively supplied.

Q. Okay. If we can go to {C4/7/33}. We see proposition 82 there. I am now on the question of are marginal costs high or are they low? That is the question I am on, and that is the question that you are addressing here.

You identify, in the first paragraph, four categories of marginal costs; not limited to, but these are the four you identify for the developers; yes?

A. Yes. I cite two different sources for marginal costs, so I am not sure there is perfect overlap on the two. I do not know if this is the Ghose and Han or the Howell four. I looked at them and they have some overlap but they did not perfectly overlap.

Q. They seemed pretty similar to me. But taking these four, just read them to yourself and just remind yourself what they are.

(Pause)

A. Yes.

Q. Now, those costs are not marginal by transaction, are they? They do not increase every time someone buys another bag of gems or another sword or another 800 Robux --
A. I think if you are taking the derivative with respect to a transaction, I think I am with you that you might not incur those with a transaction. You could incur those at the margin with a new user, however. The literature, the economics literature, Ghose and Han, recognised that developers incur marginal costs, that is their phrasing, "marginal costs", and these are the four categories that Ghose and Han list.
Q. They are not big, are they, these marginal costs?
A. I do not think it matters if they are big or not. Your proposition is that there is zero. I do not know if that is fair. We can let Dr Hitt say what he thinks.
Q. Just to be clear, my proposition is zero or close to zero, because either is good enough for --
A. No, no. Even with positive marginal costs, Dr Hitt's overly complicated logit formulas will produce a pass-through.
Q. Yes, but it will be small, because it will be proportional to what those marginal costs are?
A. We do not know how small it is. It depends on a whole bunch of -- you know, he has multiple parameters in that

formula.

Q. Okay. So now I am going to move on to the question of why linear or logit in particular.

A. Okay.

Q. In both cases, your evidence for selecting them as reasonably good approximations is that you have run a regression using the App Store transaction data, and you say they do a good job of explaining the relationship between price and quantity for different apps; yes?

A. Close, and I will be quick. For the linear model, the linear model would predict that there is a negative relationship between an app developer's price and its sales and units, and the linear model fits the data well. There does appear to be a negative relationship across all genres, 28 for 28 I think.

Then for the logit, you are slightly off, it is shared, but we are just being technical; right?

Q. No --

A. So the logit model says, and it is not completely different, it is in the ballpark, it says there should be a negative relationship between an app's price and its market share; right? So we try that specification out. That seems to fit the data well. We get almost every category, 28 of 28. You get the correct sign, it is statistically significant, saying that, all things equal, when an app developer raises its price it loses share.

So that is what gives me confidence that either one of those two demand structures, which by the way are probably the most common demand structures in all of economics, we can write it up on a blackboard, that economists start from, as predictive of what pass-through might be.

Q. Okay. Shall we get going with the linear one? Let us get it up. It is {C2/8/147}. So here you have set out for us the results of your linear demand regression in a table, and you have two columns for your two different regression approaches; yes?

A. Yes.

Q. One of them uses app prices directly; yes?

A. Yes.

Q. The other one uses an instrument which is basically a proxy for price; yes?

A. Yes.

Q. Just before we look at that, if we can just look at the regression equation. So what you are saying here is that the quantity of app transactions is equal to a constant for that type of app, so for that specific -- that product, minus data, which is just a parameter,

times the price for that particular product. Is that fair?
A. Right, and just the reason why there is a subscript on that alpha is because we allow the constant to vary by genre -- by app, by app. We have app fixed effects.
Q. I think, I do not want to have an argument about this, but I think it is actually at the product level that individual --
A. Oh, product fixed effects? Oh --
Q. It is like individual --
A. -- I think we might be saying the same thing. I did not say developer, I said app fixed effects. I think we are saying the same thing.
Q. No, no, it is more specific than apps. A bag of gems is one, and 80 Robux would be another, and 800 Robux would be another. That is why -- they have all obviously got a different price associated with them and a different quantity and that is how your regressions work. But let --
A. Okay.
Q. If you are not sure about that --
A. Anyway, but the coefficient -- we agree that the constant term varies by product, the --
Q. Exactly, yes. Whereas the beta term is fixed by genre?
A. The beta is constrained to be the same, yes, across all

apps in the category. What we are testing is, all things equal, if you raise your price do your sales go down? This is what this is showing.
Q. By how much.
A. By how much. Well, at the end of the day, you know that we are not going to ever make use of a particular coefficient here; yes.
Q. Exactly. It is hard to know what the right answer should be because you are fixing the same beta for a Robux transaction and for a download of an app like Minecraft and for any other transactions, are you --
A. No, this is fairly standard, to search for a coefficient that is the same, a price coefficient that --
Q. I am not --
A. There are other specifications. You could interact, if you wanted to, the price coefficient with the product fixed effects if you would like to allow the price coefficient to vary.
Q. Okay. So now we have established what the regressions are, I just want to ask you some questions about the use of the proxy in the instrumental variables regression. Just to flag, sir, this is a new point that has not been put to you before. I am going to put it very gently and see where you get to with it, and if you cannot answer it, you cannot answer it, okay?

A. Okay.

Q. I will do it as fairly as I possibly can.

If you go back to {C2/8/146}. This is where you explain why you are doing an instrumental variables regression; yes? Just have a read of paragraph 298.

A. Okay.

(Pause).

Okay, I have read it.

Q. So the problem you are addressing, it is a standard problem, as you say, is that if you just run a straightforward regression of quantity on price, it may suffer from endogeneity problems; yes?

A. Yes, which could bias the coefficient. Again, we are not going -- we are not counting, we are not too terribly interested on what the process coefficient is. We just want to know: are they negative; right?

Q. Okay.

A. To the extent there is endogeneity going on in that first column, it could bias the coefficient, yes.

Q. That is fair. The standard solution, as you explain, is to use a proxy for the price in the regression instead; yes?

A. A proxy. Economists like things like cost, things that shift the cost around, yes.

Q. So it needs to be something that is not correlated with

demand?
A. Correct.
Q. So you chose VAT, because that goes -- as you say, it goes up or down for political reasons, rather than because of demand going up or down; yes?
A. Yes, it is a nice experiment. It comes from outside the system. It is not endogenous.
Q. If we go to {C2/8/148}, please. I suspect when you realise what has happened here, you will agree with me that it is the wrong thing, but as I say, let us see.
Just at the bottom of the page, the notes. You can see that the IV -- those are the proxy regressions for everyone else, instrumental variables, regression estimates -- use the tax amount to predict the post-tax price.
I did not realise this when I first read it, and I am not the one who spotted it either, but what we have now realised is that you have not used the VAT rate as the proxy, you have used the VAT rate multiplied by the price as the proxy of the price.
A. I am not sure of that. I am not sure of that.
Q. Okay. I can show you if you like. But would you agree with me that that is -- I do not mean to have a go at you, but that is a howler, if that is what you have done?

A. It is not a howler. It is an exogenous shock. It is an exogenous shock set by the government that raises the firm's costs.
Q. Shall we have a look at the output of your regression analysis?
A. If you think it is helpful. I mean, I do not know where ...
Q. We will do it briefly. Let us go to {C5/289/1}. So this is the Stata output file from your regressions. If we go to {C5/289/7}. The bottom of the page, this is where you have got your first stage regression, so this is where you are creating your proxy for the price. You can see that the regression you have run is the post-tax price, so that is going to be your -- that is the post-tax price that is charged by the developer, and you are running that on the tax per unit; yes?
A. Yes. Where can you tell that? I am sorry.
Q. If you see at the bottom of the page all of the dependent variables: tax per unit 1, tax per unit 2, tax per unit 3.
A. This would be a measure of the incremental cost that is being determined exogenously. It is not moving the demand curve around for the company; right? It is a supply shock. That is what economists use as instruments.

Q. Dr Singer, the tax per unit is the tax percentage multiplied by the price.
A. Yes.
Q. You are doing a regression here of price on price.
A. No, we are looking at whether the cost going up, by virtue of the VAT, caused the price to go up. That is what we are asking.
Q. Do you see the R-squared?
A. Excuse me?
Q. Do you see the R-squared? 0.99? This is not an instrument, this is just the price variable.
A. No, it is the cost. In this case, the cost is related to the price. But you know, again, your economist did not raise this issue. It is probably because it is not an issue.
Q. I am not going to take it any further than that, Dr Singer.
A. Great, great.
Q. That is fine. I just felt like I could not let it slide.
A. Yes.
Q. If we could go back to {C2/8/148}; back to the points that you have had before.
A. Okay.
Q. So at the bottom you can see the R-squared figures and

the adjusted R-squared figures. Just so we are all understanding what these are, these are essentially measures of what percentage of the variation in quantities that we observe that you are able to explain with your explanatory variables, yes?

A. So not quite, but I will give you a B-plus, a B-plus.

Q. Thank you.

A. So that is how most non-economists think about R-squared. But R-squared is actually a harder test; right? Because the R-squared is telling you how much better the model predicts over and above the prediction that could be made with knowledge of the average alone; right?

Q. Okay.

A. So you guys should get together. I know you know that. You have got to help him out, okay? Go ahead.

But it is wrong to say that it is a measure of how much of the variance can be explained.

The naive predictor is just the average. What the R-squared is telling you is, relative to a world where all you knew was the average of the population, how much better is your prediction model at explaining variation in the dependent variable; right? So it is a harder test than the one that you have --

Q. Right.

A. I am just keeping you on the --
Q. No, it is good. I like it. But on that, how much better it is explaining it. The "it" that is doing the explaining is all of the variables in your model?
A. Correct. All of the variables, yes.
Q. So that is the 3.6 million dummy variables plus the 28 genre price variables?
A. Correct.
Q. Just thinking about this logically, those 3.6 million, they are just all different products. The overwhelming majority of the difference in qualities is going to be driven by factors like whether that particular product is much more popular than average or --
A. Sure. The fixed effects are making big contributions to the predictive power, but economists have designed a test to let us know if the price variable is carrying its weight. This was a surprise to me from Dr Hitt. We have a test for this, which is once you are controlling for all the other things in the model, does the price, does the inclusion of the price carry its weight? Is it improving the explanatory power of the model?
We have a test for that. It is the P value associated with the price. These price coefficients are economically and statistically significant, and the adjusted R-squared goes up. That tells us that they are

carrying their weight, that they are offsetting the loss of degrees of freedom.

So I am surprised -- this is a surprising notion from Dr Hitt.

Q. Okay. Can we just look at what Dr Hitt -- Professor Hitt did. It is {C3/8/136}.

In Exhibit 5, what he is showing you is the adjusted R-squared for your regressions, and then your regressions with all of the price variables taken out?

A. Yes.

Q. Yes? Now, you just said before that the adjusted R-squared goes up.

A. It does. I have tested it.

Q. Well, Professor Hitt says that it is either 0.34 or 0.34.

A. That is because he is only taking it up two decimal places.

Q. Okay.

A. No, but the test here is the P value. There is no doubt that the price coefficients -- I mean, if you took a class in econometrics, you would know that the P value tells you all you need to know. It is a summary statistic. Is this variable statistically significantly different from zero or not.

Q. I do know that that is -- what the P value means.

A. This test is so unorthodox, the one that Dr Hitt put --
Q. It is because we are doing something different --
A. I know, you are trying to do like the relative weight. But what we want to know is, controlling for everything we know about this app, does the price relate negatively to sales in an economically and statistically significant way? The answer to that is yes.
Q. Dr Singer, if that was the bar you had to get over, if what you are telling this Tribunal is that: if we run a regression of quantity on price, and we get a price coefficient that is negative and statistically significant, then we can conclude that that is the right demand function?
A. No.
Q. If that is the bar you are trying to get over, then that is a ridiculously low bar.
A. Okay. That is not just the bar. Because here what we are doing is we are asking: what is the incremental explanatory power of price over and beyond that which can be explained by the fixed effects, which you guys keep harping on, are doing such a good job in explaining.
So we are actually making the bar really high. We are saying: after you control for the fixed effects, right, is there any more incremental explanatory power

that can be attributable to price? The answer is yes.

So I do not know if I would be prepared to say that the linear model, as I ran it here, is going to work in every application. We have to go -- we have to go and do this test and see if the coefficients come back negative. What if half of them are positive and half of them are negative? We would reject the fifth of a linear in that case. What if they were not statistically significant? We would have to reject.

Q. Dr Singer, what Exhibit 5 shows is that in neither of your models, neither linear nor logit, is the shape of the price term in the demand function adding any material explanatory --

A. That is false, it is false, and it is upsetting to hear those words coming out of your mouth, because you are violating the fundamental building blocks of econometrics, which is the P value -- like in a typical case where the economic fight is over the conduct coefficient, right, controlling for all of the things that explain prices in the industry, did the conspiracy -- was the conspiracy associated with a positive shock to prices? That is where we are, in all price-fixing cases.

The fight there is: does the coefficient on the conduct term, right, this conspiracy, is that positively

and economically statistically related to prices? If it is, that is indicative of a conspiracy, actually, raised prices. That is the fight. The fight is always over the P value. But no one has ever said: oh, but that price, Dr Singer, is not contributing as much as fixed effects. I mean, that is not the fight. The fight is, what is the coefficient on the variable of interest? That is what we are interested in.
Q. What we are interested in is whether you have got the shape of the demand curve right at all. We are not interested in whether demand is upward-sloping or downward-sloping. That is what the P value is telling us. It is downward sloping.
A. It is downward sloping in prices, yes.
Q. Yes, that is all. Not that it is linear or logit or anything else.
A. So a standard demand curve, as you draw it up on a blackboard for an economics class, is the linear demand curve. This is the seminal case. So it should not be -- it should not be shocking to you that the linear fits this data.
Q. Okay. Dr Singer, we will move on.
A. Okay.
Q. We could do this all day.
With the IIA -- sorry, with the logit demand model,

I think you would agree that the logit demand system has built into it the assumption that the IIA property is satisfied; yes?
A. Yes.
Q. That is something that has been considerable debate between you and Professor Hitt about, as to whether it is made out on the facts of your dataset; yes?
A. "Considerable"; it seems to have come -- it seems to have come late, but yes, it is fine. It is a debate. We have had many.
Q. You say it comes late; it cannot have come as a surprise to you, Dr Singer, because the same thing came up when you gave evidence or tried to give evidence in the Google Play Store litigation in the US, did it not?
A. Yes, there was a fight over the IIA being satisfied, yes.
Q. Exactly. Let us have a look at what District Judge Donato said there.
A. Are you looking at his first opinion or ...?
Q. We can look at the second one.
A. I can imagine why you do not want to look at his first one.
Q. We will look at the last word, which is --
A. I think the Tribunal should know both and understand why he reversed himself.

Q. You can be taken to the other in re-examination.
A. Okay, fine. But for the record, he certified the class around my logit in his original class cert order, after hosting -- after hosting a hot tub between me and Google's expert.
Q. Let us look at what he said after that.
A. After Google appealed the case to the Ninth Circuit, the Ninth Circuit accepted Google's appeal, and about two weeks before the oral arguments of the Ninth Circuit the judge reversed his class certification decision and nullified the need for a hearing.
Q. Let us have a look at it then. So it is {AB5/8.1/1}:
"Order Re Merits Opinions of Dr Hal J Singer."
That is you.
If we can go to {AB5/8.1/15}. You can see here, towards the bottom, dealing with the arguments about whether the IIA properly is reliably established in the same type of logit regression that you have deployed in the present case?
A. Yes.
Q. We can see that what you said there is that -- or what Judge Donato said, sorry, he says that your main defence was to say that IIA is reliably established here, because you have:
"... confirmed using standard regression models from

the economic literature that the logit demand curve is well-specified here."

Yes?

A. Yes.

Q. That is something that you have said in these proceedings as well? It is what you said in the hot tub?

A. Yes, and it is something that Professor Train in this textbook says as well.

Q. That is right. So you cited Professor Train here and you also cited Professor Train in the US; yes?

A. Yes.

Q. That is what the judge goes on to deal with.

What the judge says is that:

"The problem is that nothing validates the use of regressions in this manner. Professor Train certainly did not identify this kind of regression analysis as a way of validating a use of logit."

Professor Train did say, and this is the quote you like, that:

" ... the 'independence assumption ... in fact can be interpreted as a natural outcome [a natural outcome] of a well-specified model', and that 'in a deep sense, the ultimate goal of the researcher is to represent utility so well that the only remaining aspects constitute simply white noise; that is, the goal is to specify utility well enough that a logit ..."

If we can go over the page {AB5/8.1/16}.

" ... model is appropriate. Seen in this way ..."

We continue in the quotation from Professor Train:

"'Seen in this way, the logit model is the ideal rather than a restriction'."

Then the judge says:

"But this observation does not appear to fit [your] model. [You have] not specified his observed variables so well that 'the remaining, unobserved portion of utility is essentially white noise'."

The judge says:

"Rather as one of the experts, [I imagine for Google] notes, [your] model 'includes only the app price and a set of SKU-time-state indicator variables."

That is similar here, where all you have is the app price and the 3.6 million fixed effects.

"[That] leaves plenty of room for substantial correlation among the remaining unobserved portions of a consumer's utilities for apps. For example, consumers who like a given single-shooter game likely also like other single-shooter games ... That is, such consumers will exhibit positive correlation among unobserved parts of their utilities for single-shooter games."

That must be true a fortiori if you are looking at the whole of the game genre.

It goes on:

"The unobserved portions of their utilities are not just 'white noise'. The price and indicator variables included in [your] model would not capture this correlation in consumers' preferences over single-shooter games and therefore the 'ideal' would not be met and the logit model would not apply."

That is all correct, is it not?

A. No, of course it is not correct, I respectfully disagree. He got to the right conclusion in his first order, his class certification order. But here what he is basically saying is that the model is not well specified because it does not include every other variable that could explain the variation in market shares, and he gives an example about single-shooter games.

Well, the question that I would put back to him is: what dataset does he have in mind as to where we would go get additional control variables to account for that variation? Should I have had a dummy variable called single-shooter game 1.0 for those that did and did not?

It just seems like he is interpreting Train -- well, I guess what we are bickering over is the meaning of the word "well-specified". So I believe that I have a well-specified model. He says it is not well-specified because there are omitted variables in it; right?

Now, Google's experts never identified which omitted variables they were. No one identified a set of data that would allow me to bring in and control. You know, by controlling for the detail fixed effects of what the app is, what the in-app purchase is, I would submit, respectfully, that I am capturing whether it is a single-shooter game or not. So I will leave it at that.

Q. Thank you. I mean, what the judge is actually saying is that you can only pray in aid Professor Train's observation, which you have taken out of context --

A. I did not take it -- I give the entire quote. I could not have taken it out of context.

Q. You could only have prayed that in aid for your choice of the logit model if what you have done is put so much into the logit demand function that everything that is left over is white noise. That is what --

A. I would gently submit that I have put everything that I possibly could put into the model, in the data, through the fixed effects and the price effects.

I cannot conceive of other variables that I could have brought into the model; right --
Q. Are you saying that what is left is white noise? Really?
A. No, I am saying that I am making use of the data that is available to me and I am estimating the best model. He approved and certified the class around that model in the first instance. I can point to -- in addition to the Train quote, I can point to myriad articles that have been published and peer reviewed where applications of a logit have been used without any direct test of the IIA, and what that tells me is that while it is nice to have, it is not an essential ingredient. So I will leave it at that.
Q. Dr Singer, transactions for the download of an app are very likely to be correlated with transactions for the download of IAP products for the same app, are they not?
A. I do not know what you mean by that, sorry. Why do you not -- the transactions are correlated? What do you mean by that, sorry?
Q. The --
A. The Q? The P? What are we talking about?
Q. Just as the judge is saying, or maybe the judge was quoting Dr Leonard at that point, maybe just as Dr Leonard was saying, the consumer preferences over

single-shooter games, different single-shooter games, are likely to be correlated but likely -- just -- as that is the case, the same is true for downloads and in-app transactions for the same app.

A. My interpretation here is that -- I will wait for you to listen, okay, is that the judge is saying that there could be special relationships between single-shooter games that I am not accounting for in my application of the logit model; right?

Now, we could have created a dummy variable for -- that is equal to 1 for a single-shooter game. But if we go down that hole, we would be creating dummy variables for just a whole arbitrary host of potential controls. I thought it was sufficient for what I did to use a fixed effect that captures innate characteristics, time and varying characteristics of the app, that can explain how popular and how many sales and what market share that app would have. I cannot envision -- it is hard to fathom that I should have had a dummy variable called single-shooter game, and I do not know -- I think my fixed effect captures it, and I do not know how better else you would do it.

Q. Dr Singer, at the end of the day it is possible, is it not, to test empirically whether the IIA properly is satisfied?

A. I think we quibble here too, respectfully. I do not think there is a great test for the IIA, because what the IIA is really asking, as you know, is how would consumers' purchase patterns vary if you were to remove a choice from the choice set. I hope you agree with me on that. There is some great literature out here, saying that it is very difficult to go back and unscramble the eggs after they have already been scrambled. The seminal election is the election in the United States where we had a third party, Ross Perot. You could go back and do a test of the IIA and see if Ross Perot drew equally from Bush or Clinton, but the point is that Ross Perot was on every ballot. He was on every ballot of every voter in the country, at least I think he was, in every state.

So what the IIA is trying to ask is: if Ross Perot were removed from the slate of presidential candidates, what would the shares have been? That is what the IIA is trying to get at. The problem in the recognised economics literature is that Ross Perot was not removed. He is there.

So what economists have tried to do to test this as best they can is they go back in the data and they blow out the observations, the votes on Ross Perot, then they reestimate the model. There is something unsatisfying

to that to an economist, because we know that Ross Perot was there. So in all the choices the voters made between Clinton and Bush, those preferences are still being reflected conditional on Ross Perot being there. We do not ever get to see how the voters would have voted in the absence of Ross Perot.
Q. All right, Dr Singer. Can we please go to your preliminary report. So that is {C2/3/26}.
A. Okay.
Q. I am trying to speed things up. In the footnote at the bottom of the page, footnote 87, so the first of them, you can see from the top that you are referring to the decision that we have just been referring to, that I have just been showing you, excluding your testimony.
A. Yes.
Q. If you just read the last sentence of that footnote.
A. Okay.
Q. "I also plan to test directly for the IIA assumption."
At that point you had not done a test?
A. Correct.
Q. But at that point, you said that you would do a test?
A. That was my intention, was to do one, yes.
Q. It is what you told the court, you would do it?
A. Yes. Well, it was my intention that I would do one, yes.

Q. Did you?
A. I tried to do one and I could not. You know, I could not -- well, there was an error. We tried to come up with one in the joint session, as you know. There was an error in it and I decided to retract it.
Q. An error in your one, do you mean?
A. Yes, an error in mine.
Q. But you did not do it before that?
A. Not before that, no.
Q. You did not explain in your main report, I struggle to know what to call it Singer 2, your main report, you did not explain your decision not to do one?
A. No, because I had not tried one yet. We tried to do it at the joint session.
Q. Okay. Professor Hitt did his own one in the joint session; yes?
A. I cannot recall when Professor Hitt's came out, but I think we both were exploring tests of the IIA, in collaboration actually. I think I turned over my code to Professor Hitt's team. So yes, we were both exploring different tests of the IIA.
Q. Thank you. Then you responded to that in Singer 4; do you remember? That is the November 2024 report; yes?
A. In part. I feel like I have responded to it in a few different ways now; but, yes. I cannot remember if we

had done the 20 of 28 at that time.
Q. No. I have never seen the 20 of 28. I heard you say it in the hot tub. I have never seen it in writing.
A. Yes, it is probably something we did post, post.
Q. Post, post, post, post, post?
A. No, just two posts. I only used two posts there.
Q. You mean --
A. But Dr Hitt, this is all in Dr Hitt's code. He can look to see -- Dr Hitt has one test for parameter stability across all 28 categories. If he wants to see which parameters were stable and which were not, he can verify this, but 20 of 28 do not move them in a statistically significant way.
Q. We will come back to that. Do you accept that his test was properly implemented and carried out or do we need to go and look at the Stata manual?
A. Well, it depends on which test you are referring to. He tried one and he got the error code that said you cannot take stock on these results, do you remember that?
Q. You are saying that did not produce a result, or ...?
A. It produced a result with a negative covariance matrix and Stata put out the blinking warning sign. We just wanted the Tribunal to know what the warning sign said; right. He went back and he did it again, yes.
Q. That is actually not quite right, so --

A. Okay. Like the order, the order of things?
Q. No, no; the way it works is that when Stata tells you -- perhaps I will just show you. If we go to {D1/1746.1/1}.
A. Yes.
Q. So this is the Stata manual section on the Hausman test. Does that look familiar?
A. Yes, yes.
Q. Yes. If we go to {D1/1746.1/10}. So you can see at the top, it explains how the Hausman test works. The way it works, like most statistically tests, is that you calculate a particular statistic, a particular number, and this number, we are told, is distributed, (inaudible) squared, that is a probability distribution, and you calculate it by multiplying the vector, that is the one with the betas, by the inverse of a matrix, that is the covariance matrix you just mentioned, by another vector of the betas; we do not need to worry too much about all of that.
A. Yes.
Q. The issue is that you cannot actually invert a matrix unless it is positive, definite?
A. Yes.
Q. But you can do something else, which is a generalised inverse, instead, and that is what is referred to in the

paragraph underneath.
A. I think this is what Dr Hitt did in his final attempt.
Q. It is not what he did. What he said, and this is what is backed up by what we are looking at now, is that when the difference in the variance matrices is not positive, definite, Stata, not Professor Hitt, Stata goes and uses the generalised inverse instead. We know it did that, because it spat out a result.
A. It spat out a result, but it also spat out an error message that we seized on and we just wanted to call attention to that. He went back and said he could redo it without generating the error message, and now we are in this world where he shows stability on 20 of 28 categories and he has some instability on eight.
Q. Okay. Well, on that last point, Dr Singer, that is not a point that has been raised before, even in correspondence in relation to Hitt 4. It is the thing you said for the first time in the hot tub.
A. I am not sure, I feel like there was a correspondence. There could have been a letter that came through from plaintiff's counsel that mentioned this. I just -- I cannot remember when.
Q. Not one that said that.
A. Okay, okay.
Q. As far as I am aware. In any event, I have checked with

those behind me, and obviously there is not much we can do about it, but I have checked with those behind me and I am told that it is wrong, but we cannot take it any further than that, because we do not have the material.

THE CHAIRMAN: If you are going to ask him a question, then fine, but otherwise, we understand the point.

MR PICCININ: That is where we are.

Okay, so that is it for incidence.

I now just want to really put to you some very short propositions about how to approach quantum.

A. Okay.

Q. So just pulling together the threads; and I think we have covered these along the way, really, but I just want to make sure it is all in one place, so that you have had an opportunity to say what you have got to say.

So for quantum, for the exclusionary abuse, for transactions that would have taken place through the app store and Apple IAP and the counterfactual as well, loss is measured by the extent to which Apple would have reduced its effective commission on those transactions in the counterfactual, multiplied by the incidence rate applicable to transactions on the App Store and Apple IAP?

A. I have never defined incidence as being specific to a platform, so I just would say: multiplied by the

incidence rate.
Q. I know you have not; but in the course of the argument or the discussion, in the more friendly way that you and I have been having, I have put to you some scenarios and --
A. I have never -- sorry, but I have never heard of incidence by Defendants. I mean, there is incidence, there is just incidence. Dr Hitt and I, despite our disagreements, we are trying to estimate one incidence, we are not trying to estimate an incidence by platform. I have never seen platform-specific incidences from Dr Hitt.
Q. No, absolutely not.
A. Okay, because there is one incidence --
Q. As we discussed before, your steering point, I was putting to you, only relates to transactions that are not on the --
A. No, I disagree with that. Okay, fine. Let us move on.
Q. So for transactions that would have taken place through an alternative app store in the counterfactual, loss is measured by the difference between the commission charged by Apple on those transactions in the real world, and I think you said, when Ms Demetriou was asking you about this, the counterfactual commission charged by Apple in the counterfactual --

A. Absolutely. That is how we do damages in every case.
Q. That is fine; multiplied by the incidence rate --
A. Right.
Q. -- applicable to those transactions, insofar as it is different, would you say?
A. But it is not different. But I just -- in case there -- this should be fairly common to the Tribunal, that it is conceivable that a consumer could have done even better in the but-for world had it gone off of Apple and gotten an even lower price or a lower rate on some rival platform, but we are going to assume that the but-for transactions, whether they occurred on the Apple platform or occurred off, would all be captured at the competitive equilibrium price.
Q. Okay. Then in addition to that, if we are right that in the counterfactual Apple would have introduced additional charges, then we would need to account for those in the damages calculation as well?
A. Not necessarily. Remember, if the new charge takes the form of a fixed price, so, for example, if it is a higher developer cost, the SDK cost, 99 or, say, 109, I would submit that we do not need to trace it through, because that would not enter into the pricing calculus.
If it is a new commission that recreates the tie, well, then you already know what I think about that.

So -- well, that would affect pricing and would squeeze back the surplus that was about to be handed over to consumers.
Q. You would say, as well, if it were -- if it were expressed in, say, pence per transaction, rather than a commission -- rather than a percentage --
A. Yes, it appears that Apple, and I will be more sensitive than I -- I had forgotten that was an off-limit thing. But yes, but it appears that you can -- how about this: you can recreate a commission-based penalty with a per unit penalty as well.
Q. Your view is that that would be passed through as well?
A. Well, yes. Then I would think Dr Hitt would agree with me that that would be passed through.
Q. Insofar as we like to distinguish between pass-through rates for decreases and increases, that would be an increase, would it not?
A. If it is a ...
Q. It would be a new charge that is being incurred on transactions?
A. I would not think of it that way. I think of it in a better way, it is a reconstitution of the tie. So you would just go back to the 30%. So basically there would be no change in the commission.
Q. Okay. Then if we are right that the exclusionary --

what you call the restrictions are necessary in order for producing certain benefits to do with privacy and security and that sort of thing, then would you accept that -- if still somehow it ends up being abusive, would you accept that we also need to make a subtraction for any losses that consumers suffer from the reduction in those security benefits?

A. I think that it is fair to -- for the Tribunal to try to evaluate whether the restrictions are necessary to preserve the same level of security and privacy and whether the removal of the restrictions would result in a diminution in security. But I am concerned, as I said -- I can't remember which day now, I have been here a while -- you know, Dr Sweeting's approach does not give us any evidence as to the reduction in the value of security owing to the restrictions.

Q. I know you disagree about that; but it is not --

A. Okay.

Q. Then in all of that exercise that we have been talking about, if the delayed counterfactual is the right counterfactual, we also have to take into account the time it would have taken for entry to occur and for competition to drive prices down?

A. I feel like my delayed counterfactual analyses do take into account the time adjustments. So I think hopefully

I am in agreement with you.
Q. Okay. I mean, I think we disagree on whether they do that to a sufficient extent, but you have already had that debate with Ms Demetriou --
A. Oh, okay.
Q. -- and me. Finally, in all of this, we are looking at a UK-only set of decisions by developers, are we not?
A. For what purpose? I am sorry.
Q. Sorry, we are looking at the incidence decisions that developers would be making for their apps in the UK?
A. I think that is fair, yes.
Q. Okay.
A. The restrictions -- in other words, the restrictions are only going to be taken away in the UK, yes. I think that is fair.
MR PICCININ: Those are my questions.
THE CHAIRMAN: Thank you, Mr Piccinin.
Any re-examination?
MR WARD: No, I do not think so.
THE CHAIRMAN: Anyone at all?

Questions by THE TRIBUNAL

THE CHAIRMAN: Well, Dr Singer, one last bit. The Tribunal are going to ask you some questions. You have helped a bit, because you have covered some of it just now with Mr Piccinin, but I wonder, could we just perhaps pass around a diagram for you to look at.

A. Okay.

THE CHAIRMAN: We will give some copies to counsel as well. I hope this -- none of this is going to be too complicated or controversial, but I think probably as we go along there will be some questions that might require a bit more ... I will try to flag up the interesting bits.

(Handed)

I will just explain. Firstly, before you look at it, let me just tell you what I am trying to do here. So what I am trying to do, we want to have a look at the economic activity that is taking place. So what we are trying to do is to put aside the way that Apple has been seeking to monetise the different services, and we just want to simply look at the services, who is providing what and to whom, and what sort of value is arising from that.

I think it is probably fair to say this is a sort of counterfactual analysis, because you will see that it does assume there is an alternative distribution system and it assumes the possibility of alternative payment, and we will pick that up as we go. But the key point is that we are disregarding Apple's choices as to monetisation. We are not being encumbered by the way

Apple has historically chosen to monetise, and we are just looking at the services and where the value, if you like, might arise that they could charge for.

Could we start at the bottom left. If you see anything that you think is wrong, do say, but hopefully it is uncontroversial. You have got, forgive my scrawly writing, but down here you have the App Store.

A. On the bottom.

THE CHAIRMAN: On the bottom left.

A. I see "App Store". I just want to make sure I am on the right one. This one right here? (Indicates)

THE CHAIRMAN: Exactly. What I am trying to show here is that we have got, just above that, the App Store is providing distribution services to the developer.

A. Yes, and the primary -- the primary market, yes, yes.

THE CHAIRMAN: Exactly. That may or may not -- well, in the counterfactual, that may or may not include payment services, because as we will see in a minute, the payment service may have been segregated, but it could of course be aggregated.

A. Okay.

THE CHAIRMAN: Then the developer is, as you see, paying commission for that service, coming back down.

A. Yes.

THE CHAIRMAN: Then just to recognise that below the App

Store to the left, we have recognised the possibility that a payment service could be provided through the IAP, so Apple does everything.

A. Which one is that? Maybe I am just --

THE CHAIRMAN: Just go to the right of that.

A. That one? (Indicates)

THE CHAIRMAN: Keep going right. Down below that. It says "IAP" there?

A. Yes.

THE CHAIRMAN: Yes. So that is Apple doing payment in-house, payment processing in-house, doing everything.

Then over to the left, you have got -- I have put "Paddle", but of course, as we know, there are other payment service providers. Clearly if Apple is doing it through IAP, they are going to bundle up the charge and it will be part of the services provided by them and the commission will cover it.

A. The commission for the in-app transaction would cover the payment processing, yes.

THE CHAIRMAN: Exactly. I am not trying to make a point about the distinction between -- let us not get into this question of whether it is primary or aftermarket. I do not want you to be bothered by that. Nothing that comes out of that goes to that point.

A. Okay.

THE CHAIRMAN: On the left-hand side you have got Paddle or whoever it is, and obviously if they were providing this, then they have a direct relationship with the developer and provide the payment service and get feedback.

A. Yes. I like that, because in the aftermarket it is a one sided --

THE CHAIRMAN: I am not trying to make an aftermarket point. I know you do that. I am not suggesting an answer to that point, I am just trying to work out where the services are.

Just pausing on -- just trying to perhaps be clear about the different types of services here, the commission that is charged to the developer by, say, Apple here, will depend on whether it is providing full merchant of record services, you know, it is doing the whole lot, or it is possible that somebody could be providing some of that, which Paddle could be doing the full merchant services or it could be doing some of it or it could be just providing payment services. Does that make sense?

A. Yes, yes, yes. I acknowledge that in the counterfactual there could be some skinny, if you will, providers in the aftermarket that are just doing payment processing, in which case somebody else would have to handle the residual suite of in-app support services. Then there could be somebody like Paddle who has the thicker suite of offering, where they are displacing or replacing all of the aftermarket services of Apple in the aftermarket, yes, yes.

THE CHAIRMAN: So the service that Apple is providing, forgetting about the distinction between the markets, but the service that Apple is providing contractually to the developer could vary, depending upon how much the payment processor was doing (inaudible).

A. Correct. In the -- certainly in the case of a skinny, if the person who steps in does not fully replace the suite of what I have defined as the in-app support services, someone has to do it.

THE CHAIRMAN: Yes.

A. Yes. It could be Apple, it could be a third --

THE CHAIRMAN: It could be someone else, yes. But what I think we do know is that, no matter what the alternative payment provider is doing, there will always be some elements of distribution which the App Store is carrying out. You mentioned some of them yesterday, we can look at them if it is helpful, where you talked about App Review, search, information provision, user reviews. So there is always going to be a service regardless of who is doing --

A. Matchmaking. You left out my favourite, matchmaking.
THE CHAIRMAN: I suppose they are matchmaking services, are they not?
A. Yes.
THE CHAIRMAN: I wondered whether it would be fair, this document that Mr Piccinin has been torturing you with. Can we look at that. That is {C2/8/101}.
No, I have the wrong reference. {C2/8/110}.
So you see here, in rows 6 and 7 you have calculated the Apple marginal cost and the marginal costs per download paid. Is that -- would it be fair to say that that is a sort of rough proxy, if you like, or a calculation of those distribution services, including, I think, the payment services here; is that right?
A. I think that is fair. We are looking at the -- in this market we are looking at the primary market, or app distribution, and, yes, they are payment services for paid apps, right. So I think that comes from Dudney. Dudney says that you could take your rate -- I mean, I am interpreting this as an economist, that if the rate were to fall to as low as 6.5%, then on the margin, right, Apple's margin would basically be taken to zero, if the commission were taken out.
THE CHAIRMAN: That is helpful. Of course, as you say, it is paid downloads, and so obviously, and again, just

(inaudible) that this is just about downloads. If you were to calculate it per all apps, then it would be a marginal cost across the whole app population, it would be much smaller.

A. I think his 6.5%, I think he is doing it for the entire App Store, and I think that would be inclusive of free apps, but that is probably a --

THE CHAIRMAN: It probably does not matter, but I just want to -- in a way, I just want to -- I suppose the point I am getting to is that there is always going to be some service, regardless of how much of the payment service someone else is doing in this world, there is always going to be some service that Apple is providing and some commission that it is going to get for the, one would assume, for the distribution of the matchmaking service?

A. I agree with you, to the extent that Apple is the sole app store. I agree with you 100%. But if there are two or more app stores, then matchmaking and distribution and all these other services that you are mentioning could be provided by a third party.

THE CHAIRMAN: I appreciate they could. Assuming that they are being provided by Apple, then you would expect, just in the ordinary course, that there would be some value and therefore a charge that could be applied to that.

A. There are --

THE CHAIRMAN: A developer would pay for the services they are getting if they --

A. Yes, and in my -- in this world, when we are measuring -- this is when you remove the distribution restriction -- oh, well.

THE CHAIRMAN: Yes, we are in that world, I think, yes.

A. Yes; that Apple would continue to be compensated for each of those payable downloads that originate from the app store as opposed to the rival -- as opposed to the rival app store.

THE CHAIRMAN: Okay, that is really helpful. Then I think when you go across to the right-hand side, what you see here is that alternative app store.

A. Yes.

THE CHAIRMAN: Actually, I think the picture is just the same, is it not? It is a distribution service being provided, whatever that is; it may or may not be different, depending upon what they are doing, but there would be a service, there would be presumably a commission paid for that.

A. Yes.

THE CHAIRMAN: If a third party provider could do it, then the alternative app store may or may not be providing some or all of the mentioned (inaudible) services and

the commission would vary depending on that.
A. Yes.
THE CHAIRMAN: Okay. Thank you. That is really helpful.
Can we go up to the top, then. This is where it potentially gets a bit more difficult, although I think I am clear about where you are on this. Again, I am just thinking about this sort of as a contractual thing, rather than anything that Apple has done in the past or has (inaudible). But essentially Apple is supplying tools and technology and IP rights, and so on. It is licensing those to the developer.
At the moment it is -- at least, you say, it is recovering $99 or £79, or whatever it is, as the developer program fee?
A. Yes.
THE CHAIRMAN: I have put a plus question mark over there, because I think it has come out in the discussion with Ms Demetriou that you recognised that Apple may choose whether it charges more or less or indeed differently to developers or some subset of them, in order to get a return on the provision of the tools and tech. In other words, they have got a choice as to whether to --
A. Right, but can I just -- and I will be quick. There are many developers who only contribute the $99; right? So those developers who just do free stuff, or those

developers who monetise exclusively through in-app advertisement, or those developers who sell a physical product, like Uber, right, or Amazon selling books. There are a lot of developers that are getting access to Apple's technology and are not paying anything above the $99 and Apple does not appear to be upset with them.

THE CHAIRMAN: I understand all of that. In a way, that is Apple's choice. I am trying to think not so much about --

A. Yes, my point is, is the 99 covering the access to the tech, to the IP? Because it seems like Apple is content to have thousands of developers on its site that are not paying anything more than that.

THE CHAIRMAN: No, I understand that point. In a way, I think that is probably -- I suppose that is sort of where I am going on this, at least not quite, but in that direction. But it seems to me -- a number of times I think you have said, you have just made the point just now, I think, that Apple is not entitled to recreate the tie by effectively transferring what you say is now an overcharge to some other fee for tools and tech.

A. What I call a finite penalty for breaking the bundle.

THE CHAIRMAN: Yes, so there that issue, and we understand what you say about that. But I think you do accept that there could be a fee for tools and tech in the

counterfactual that is not anti-competitive; at least $99 could be more --
A. It could be more -- what is critical in my mind about that is that, as I said, to the extent that the developer sees that as a fixed cost of just doing business, it is not going to enter into their pricing calculus.
THE CHAIRMAN: Okay, that is helpful. Can I just, before we come onto that, can I just check with you; I put it to you, just to make sure we are clear. No one else in this exercise has attempted to -- neither you nor anyone else has actually attempted to work out at what level some sort of charge by Apple might or might not properly reflect the value of the tools. That just has not been done, has it?
A. Correct. Not to my knowledge.
THE CHAIRMAN: Not specifically. Obviously Mr Holt has dealt with it in a broad sense in terms of how you look at the unfair pricing issue, but I appreciate that is not your --
A. Right, and I think that Dr Sweeting, let us say that the new charge is going to come about in the form of a commission, but I do not think that anyone has solved for what the new fee would be.
THE CHAIRMAN: Quite. Just coming on to that, and picking

up your marginal cost point. So I think you had the dialogue with Ms Demetriou that Apple could continue to recover its investment and tools through the commission, and we could look at that if you wanted to, but you probably may -- you will remember the discussion, and I think --

A. To be clear, when I said commission, sorry to interrupt, but when I said commission, I meant for those transactions that Apple consummates in the counterfactual world.

THE CHAIRMAN: On the App Store, yes.

A. Yes. I mean, they are going to be getting a boatload, that is not a technical term, of transactions coming through the App Store, and in the in-app aftermarket, through their own payment processor as well. So that would be a commission and they would continue to be compensated for those transactions.

THE CHAIRMAN: Yes, and --

A. Sorry, I am sorry to interrupt.

THE CHAIRMAN: No, that is helpful.

A. But that is the only commission that I have in mind. I have the same structure that they charge a commission that apps -- for transactions that are consummated on their properties, it is just that albeit a lower commission.

THE CHAIRMAN: Yes. I think you have just had the discussion with Mr Piccinin about the fixed cost point or the marginal cost point, and obviously it may depend a bit on how -- whatever the charge is that is passed -- if there were a charge to be made for the tools and tech, then how that structure may have an effect on the development of --

A. But this is an important point, as an economist, that we do not need to be too concerned about the magnitude of the new fees, if those went from 99 to 199; right? We are just interested in: does that work its way into the prices, the developer prices? I would submit it does not.

THE CHAIRMAN: Yes, okay. Just so I understand that.

A. Did you want to ...

THE CHAIRMAN: I think when we had a discussion about the Rochet and Tirole model, and again we can look at that if it is helpful, but there was -- actually, I think it comes out, I think it was point 2 from Mr Piccinin, where you had this debate about whether you should be putting in here any reflection of the price, Apple changing the price, the profit maximising price. In other words, basically making some changes to that.

A. On the consumer side? On the consumer side? Right. I have restricted it to be zero in the counterfactual world, and Dr Sweeting, in one of our propositions, also agrees that there is no new consumer price or subsidy that comes about, yes, okay.

THE CHAIRMAN: Now, I -- and maybe I am mixing up things, but certainly when you had the discussion with Mr Piccinin just now, I think you were saying that as a matter of principle, it was not just a matter of pragmatism; in that case, as much as anything, it was a matter of pragmatism. I think you say as a matter of principle, what Apple does with the price for tools and tech is not relevant unless it does have that direct connection with the developer price. That is the point you are making, is it not?

A. That is right. For them to upset the damages calculations, at least as I have done them, you need a -- you need a new cost that is not anti-competitive; and that affects prices, yes; yes.

THE CHAIRMAN: Yes. Just so I understand the exchange you had at the end there. Were you accepting that if it was structured in the way that was effectively a per unit cost, then it might find its way into developer prices?

A. Yes, yes. So we -- Dr Hitt and I agree that if the cost comes in the form of per unit, that is going to be passed through. We are quibbling over whether an ad valorem tax can be treated equivalently to a per unit cost. That is the economic debate that we are having.

But yes, anything -- my position is that anything that increases the marginal cost of a firm is going to affect its prices.

THE CHAIRMAN: Yes. So just, I suppose -- and one other question on that: if you -- just going back to the diagram. I think this was a point Ms Demetriou was putting to you yesterday, and I was not sure we quite got to the bottom of it. The day before, possibly.

If Apple could legitimately include in its commission, in this counterfactual world, some element of the value of the tools and the tech, okay, so they did, as I think you were hypothesising they might, increase their commission so that they are recovering, or at least treat their commission as being a recovery of some of the value that they are providing, there would be an asymmetry, would there not, with their competitor in the alternative store; is that not right? Because the competitor in the alternative store has a lot of cost base --

A. Yes. So I think -- I think this came up and so I will put a pin on it, yes. So what I said was that if there is an alternative app store, and Apple -- and Apple loses its dominance or market power in the primary market, and if Apple were to also try to inject a new commission as a penalty for going outside of its payment processing service, then it would be disciplined, in the sense that developers would say: why are we transacting over here? We could escape that penalty by going over to the rival app store.

THE CHAIRMAN: Yes, I see. So you say actually it is -- I think you are then saying it is actually not something that is likely to happen because of the competitive --

A. It cannot happen. Yes, it cannot happen. I could try it, but there would be a giant sucking sound. People would object to that strenuously if they had a rival app store that did not behave in that way.

THE CHAIRMAN: Yes, I understand the point you are making.

A. So that is why -- I think the tie, the reconstituted tie with a finite penalty price is both anti-competitive and kind of moots the entire purpose of this proceeding; but also would go away in a but-for world, where there was competition, because you cannot coerce someone into doing something or making a payment, unless you have got -- unless you are leveraging your power, right, from the primary. So if the power goes away in that counterfactual you cannot get away with that.

THE CHAIRMAN: Yes, I see. So that is effectively why you are saying, I think -- am I right in saying that is why you say that we do not need to worry too much about the

Apple tools and tech price, because if it finds its way into anything like that, it will be competed(?) away?
A. If it tries to do that, and it has lost its power, its dominance in the primary, it will be penalised, yes. No pun intended, yes.
THE CHAIRMAN: I see, yes.
DR BISHOP: I am wondering about a fee structure that is mentioned, it's a small 3% or something of your revenues derived from. Apple says to the developer: if you use our IP you must agree, here is the contract, that you will remit to us as a technology fee 3% of your revenues from -- for downloading the app, for in-app purchases. So well below the current one.
A. Mm-hm.
DR BISHOP: That is something the developer has to pay. Then Apple then turns around and says to the developer: now, if you use our services, of course you will be paying a 30% fee.
A. Okay.
DR BISHOP: 30% for all these services. But you will not have to pay that extra 3%. The only people who would in practice pay the 3% would be those who are not already paying this, and these are the ones who are using the alternative app store. Are you saying there is something improper about that, if Apple tried to do

that? I am not saying they would succeed, but if they tried.

A. So, it is hard for me to accept, only because -- are you asking me in the counterfactual world?

DR BISHOP: In the counterfactual.

A. If Apple stuck with the 30. If it stuck with the 30, they would be toast, and I can't think of --

DR BISHOP: Sure, sure. It might come down. But the key point is this: that it would not -- it would say: okay, those who distribute through our App Store do not have to pay this because it is already bundled into our pricing for distribution. But those who do not go through our App Store, fine, but some other -- various other app stores, but you must pay us 3% of your revenues as compensation for using our tools and technology. You are not saying there is something improper about that, are you?

A. So this is a new one put to me. It is not improper. The mere existence of a finite penalty does not make it anti-competitive. What Greenlee, Reitman and Sibley are looking for is a penalty price that serves to coerce.

DR BISHOP: Penalty in the sense of so outrageously large that it bears no relation to what a normal fee might be and that, in practice, is calculated in order to take away all the (inaudible) who are using it competitively.

A. Exactly.
DR BISHOP: I understand that.
A. But I cannot say that any penalty for breaking the bundle is necessarily anti-competitive. I cannot say that.
DR BISHOP: I am not trying to make about any claims about whether Apple could in practice do that, that is a complicated matter, but -- okay, fine. That is all. That is all I wanted to ask.
THE CHAIRMAN: I am conscious that that was quite a discourse. I do not want anybody to feel they have not had a chance to think about it. Do you want some time to think about whether you want to ask any questions? We are going to rise. Otherwise we will release Dr Singer. If you want to think about it, then ...
MR HOSKINS: I am keen to release Dr Singer. I do not have anything ...
THE CHAIRMAN: No.
MS DEMETRIOU: I do not have any questions either.
MR PICCININ: Neither do I.
THE CHAIRMAN: Thank you very much, Dr Singer. You could probably get some kind of award for --
A. I was going to ask what the longest run was in front of the Tribunal yet.
THE CHAIRMAN: I am not sure. I do not know the answer to

that.
A. If it is five, I would like a little plaque on my wall.
THE CHAIRMAN: I think it probably was four or five. You might be falling a bit short. Thank you very much for your evidence, it has been very helpful. You are released from the witness box.
A. Thank you.
(The witness withdrew)
THE CHAIRMAN: We will take a break, and I see Mr Holt is here. We will get straight into Mr Holt.
We will be back in ten minutes.
(3.18 pm)
(A short break)
(3.28 pm)
MR DEREK HOLT (called)
THE CHAIRMAN: Welcome, Mr Holt. I am afraid we need to swear you in again.
THE WITNESS: Yes, that is fine.
MR DEREK HOLT (affirmed)
Examination-in-chief by MR ARMITAGE
MR ARMITAGE: Good afternoon, Mr Holt.
A. Good afternoon.
Q. I think you should have a hard copy of your reports and the joint expert statement. Obviously everything will come up on the screen.

Could we start with {C2/10/1}, which is your main trial report. Can you see that on the screen, dated 14 May 2024?
A. I do.
Q. Can we go to {C2/10/170} within the report, please?
A. Yes.
Q. Is that your signature?
A. It is.
Q. Could we go to {C2/10/71} of this document, please. Can you see at figure 5.1, you present a comparison between the App Store's ROCE and its WACC?
A. Yes.
Q. Then at paragraph 170, on the same page, the figures I am about to mention are confidential, so please do not mention them out loud, but can you see there you present some figures, percentage figures for excess profitability; yes?
A. Yes.
Q. Then just over the page {C2/10/72}, at table 5.3, that presents again some figures for excess profit and other matters; yes?
A. I see that, yes.
Q. In the joint expert process, it is right, is it not, that you agreed that an adjustment should be made to the WACC figures -- sorry, that is the weighted average cost

of capital figures -- in order that the comparison with ROCE would be on the same tax basis?
A. I did, yes.
Q. In relation to that, could we look, please, at {CB2/18/1}, which is a letter from Hausfeld & Co. LLP to the Tribunal. Does that letter look familiar?
A. It is, yes.
Q. If we could just scroll through briefly to {CB2/18/2}.
A. Yes.
Q. Then {CB2/18/3}.
A. Yes.
Q. Does that letter reflect the agreed adjustments to the parts of your third report that we looked at a moment ago?
A. It does.
Q. Then could we look, please, at {C2/11/1}. Is that your reply report, dated 13 September 2024?
A. It is, yes.
Q. Can we go to {C2/11/33}. Is that your signature at the bottom of the page?
A. Yes.
Q. I am afraid there are three joint expert statements as well.
If we could go, please, to {C4/3/1}. Is that the joint expert statement you prepared along with Dr Singer

and Professor Hitt?
A. Yes, it is.
Q. If we could look at {C4/3/3}. Is that your signature, on the bottom left?
A. Yes, it is.
Q. Then could we go to the next document on Opus, which is {C4/4/1}. Is that a joint statement you produced, this time just with Professor Hitt?
A. Yes, it is.
Q. Then could we look at {C4/4/4}. Is that your signature on the bottom left?
A. Yes, that is correct.
Q. Then one more of these, {C4/5/1}. Is that the joint statement you have prepared with Dr Barnes?
A. It is.
Q. Then on {C4/5/4}, is that your signature?
A. It is indeed.
Q. Do those materials contain your expert opinion on the matters you have been instructed to address?
A. They do.
Q. Insofar as they make reference to facts, are those facts true to the best of your knowledge?
A. They are, yes.
Q. If you will excuse me while I address the Tribunal.
Mr Holt, of course, has also given two reports at

the certification stage in these proceedings. They obviously contain his preliminary views. I was proposing to swear him on those reports too, if you felt that was appropriate?

THE CHAIRMAN: I do not think we did that with Dr Singer, so it is probably not necessary.

MR ARMITAGE: I think Mr Holt was the only --

THE CHAIRMAN: Dr Singer had done one, I think. I do not think we did that, unless I missed something.

You did do it, did you?

MR HOSKINS: So he did not have a certification report, but he then, when he was instructed, submitted a report before his main report. So that is why his main report is number 2.

THE CHAIRMAN: Oh, I see.

MR HOSKINS: Because there was a number 1, and I did swear him on his number 1, but it was post-certification.

THE CHAIRMAN: I am not sure it matters terribly. If he is going to be asked questions, he is going to be asked questions. But by all means ... I think --

MR ARMITAGE: It was only for completeness, really.

THE CHAIRMAN: Okay, you could do it quickly then.

MR ARMITAGE: I will do it very quickly.

{C2/1/1}, is that the preliminary report you gave at the certification stage in May 2021?

A. Yes.
Q. If we could have {C2/1/141}, please. Is that your signature?
A. Yes, it is.
Q. Then if we could have {C2/2/1}. Is that the reply report you prepared at the certification stage in March 2022?
A. Yes, it is.
Q. Then at {C2/2/23}. Is that your signature?
A. Yes, it is.
Q. Did those reports reflect your preliminary views at the time they were given?
A. Yes, at the time they did, yes.
Q. Insofar as they refer to facts, are those facts true, to the best of your knowledge?
A. To the best of my knowledge, yes.
MR ARMITAGE: Thank you.
A. Thank you.

Cross-examination by MS DEMETRIOU

MS DEMETRIOU: Hello, Mr Holt.
A. Hello, Ms Demetriou.
Q. So I think we have between now and about 3 pm on Monday with you, and just to orientate ourselves, so I am going to be asking you questions mostly about economic value, and then Mr Piccinin on Monday at some stage, I will

hand over to him, and he will ask you about profitability; just so you know the order we are addressing things in.

Now, you would accept, I think, that even if a price is excessive by reference to costs, the price would not be unfair if it reflected demand side value; correct?

A. Correct.

Q. One reason why it is important to consider demand side value is, for some products, the costs of producing them are uninformative as to their value; would you agree?

A. That may be the case. There may be a number of reasons why you would want to look at a distinction relative to cost. That may be one.

Q. So, for example, in our opening submissions, I gave the example of a Magritte painting that sold at auction last year for $120 million, and when considering the value of that painting, it is not meaningful, is it, to ask about the cost of oil or the cost of Magritte's labour?

A. I think that is certainly a fair statement. Obviously -- I am not sure if the question also relates to how the framework would apply in that context. But obviously this framework applies in a context of dominance, and obviously the production of art is a different type of market than the one I am dealing with here.

Q. But the question of whether a painting is -- whether the price is too high, that question, when you are assessing the price of a painting, whether or not the undertaking is dominant should not matter; right? So it is only unlawful if the undertaking is dominant. When you are looking at the price, then whether or not the undertaking is dominant, the value of the painting bears no relationship to the cost of producing it; in the example I gave?
A. I think that is correct. I think all I am trying to say is that the market context forms part of the assessment as well when looking at value.
Q. Sure. The same is true of apps, is it not? So King, the maker of Candy Crush, was bought by Activision for $6 billion in 2016, and obviously it is far more valuable than its costs of making that game, which was very successful; correct?
A. I do not know about the costs associated with making the Candy Crush game, but it certainly seems plausible that it is -- the sale price was high by reference to cost, but I have not looked at that.
Q. The same is generally true, is it not, of intangible innovative products like Apple's, because you may have a flash of inspiration that leads to an innovation that is tremendously valuable; do you agree with me?

A. I have agreed, indeed, and I think there has been some discussion between Professor Hitt and myself as to the nature of innovation and how that can be a relevant criterion. So I would agree to that extent.
Q. It is also true, is it not, that for intangible products like apps or the distribution of apps, the product can be replicated an infinite number of times without any material increase in costs; correct?
A. I think obviously that is a factual question as to the precise cost structure of individual apps and/or the distribution function. Obviously some types of content, I think, can be reproduced. There is then a general question about: over what timeframe are you looking at incremental costs? But I agree with the replication point for digital content that does not have a cost of -- of duplication.
Q. If you are thinking about an intangible product that can be replicated many, many times without any increase in costs, and if you conclude that the supplier's revenue should be limited to a reasonable return on their costs, then you would end up in a position where the supplier cannot earn any more for a successful product than they can for an unsuccessful one; correct?
A. I think that may stand to reason, subject to the nature of the costs, and obviously I would expect that there

may in some circumstances be costs associated with expansion, and so on. But generally I think the proposition that if costs are -- marginal costs are low, or replication can be done at low cost, and you have a successful app, then that could lead to a high gross margin.

Were you to say that, no, economic value can only be linked to costs, then I agree with you that that would constrain the value, constrain the pricing for that type of a framework.

Q. In those circumstances, it may be the case -- so if the product is very successful, then it might enable its buyers themselves to realise enormous value; yes?

A. Well, I think obviously, in markets, if there are free transactions in a market where there are choices that willing buyers and sellers can make, then that obviously can lead to prices that are above cost; that stands to reason.

Q. That is another reason, is it not, why it is important to look at -- to assess demand side value for intangible products like Apple's?

A. Yes. I think that seems to be related to the prior question, that there may be a sense in which value can exceed costs, and I -- just to be clear -- have not suggested that cost or indeed cost plus a WACC or

anything similar to that should be the limit of economic value.
Q. Your ultimate conclusion in this case is that a competitive price for the services provided by the App Store would be in the region of -- the range of 10 to 20%; correct?
A. That was the low-high range that I provided, and then I also provided a view on my best estimate as to the -- to be precise, the not unfair price that would apply, yes.
Q. Mr Dudney has calculated ROCEs for these commission rates, has he not?
A. He has.
Q. If we go to {C2/9/8}, please.
Just focusing on 2023, if you look at 2023, so the figures --
A. Yes.
Q. The figures are confidential.
A. Okay.
Q. Or some of the figures are confidential. But he finds that they range from 150% to 322%; correct?
A. I think you just need to be a little more precise as to which of the counterfactuals we are talking about. There are several presented in this series of tables.
Q. The 10 to 20% range.

A. Oh, for the whole range.
Q. -- all the ranges. I think we need to scroll down as well.
A. Yes. Are you speaking specifically of the ROCE?
Q. Yes, exactly.
A. For 2023. So, yes. I will not read out the numbers in case they are confidential, but I --
Q. I think the percentages are --
A. The percentages --
Q. -- not confidential. The percentages are --
A. Okay. So the top table says 150%. The bottom table says 257%, yes.
Q. I think if we go over the page {C2/9/9}, we have 20%, and you can see there that the percentage is 322%; yes? Do you see that; these are for the different points in your range?
A. Yes, correct.
Q. Actually, if we look at 2022, for the 20% commission, he has found that it is as high as 381%; yes?
A. Yes.
Q. Which is about 38 times what he says Apple's WACC is; correct?
A. Correct.
Q. Now, the App Store's actual ROCE, as calculated by Mr Dudney, overlaps with that range, does it not? Let

us look at {C2/7/42}. So some of the figures, some of the percentages here are confidential.
A. Okay.
Q. But if we look, for example, at 2019 -- so 2019 is not confidential; so that is 351%; and that is less than --
A. Yes.
Q. -- the 2022 figure that you say is in the competitive range that we saw in the last document; yes?
A. Yes. I think just directly comparing the two numbers, yes.
Q. It is right, is it not, that if ROCE is going to be calculated in the way Mr Dudney has done, then whether the market is, on Dr Kent's analysis, competitive or not, ROCE is going to be a very large multiple of the WACC; yes?
A. I think the -- I think that is fair. The way I have interpreted this is to say, given the actual analysis, the analysis of the actual financials that Mr Dudney has carried out, which obviously is based on the actual commission rate and the cost analysis, what in the counterfactual would be some of the profitability indicators under an alternative, potentially, range for a not unfair commission, and I agree with you, there is some overlap.
Now, there are some factors as to exactly, you know,

what changes were made in the sensitivity and what aspects were held constant. But I think the way I have thought about this is, obviously this is really going to the assessment of the question as to whether prices have been above costs or whether profitability has been high by a persistent interval margin, and would that potentially have been the case, even at a lower level of commission, at least for this company, in these circumstances? Then I think the answer to that may well be yes.

That, I think, is not a basis on which I am making normative statements about whether, in that counterfactual, those values would be excessive, because there would be other factors to take into account; but more to the point, you would also need to move to the unfair assessment as well.

Q. Okay; and that is really -- I think you have really cut to the chase there. So I think you are acknowledging that, both in the real world and in the counterfactual world on your range of competitive commissions, the rates of return are going to be large multiples of WACC, I think, of the WACC for a sustained period of time; and there is nothing, is there, in the accounting evidence to help you decide whether 200% or 300% or 400% ROCE is a good benchmark for a fair price; yes?

A. Erm ...
Q. In the account --
A. Yes, that is accurate, and indeed I have not looked -- just to be precise, I have not looked to the accounting evidence in order to reach that view. All I have done is to essentially see whether you get to the question of the fairness debate, having carried out the price, cost or profitability analysis in the first instance.
So, yes, I think I am agreeing with you that --
Q. Right, so --
A. -- determined the -- the accounting analysis does not determine, by and of itself, the level of value.
Q. So I think we can agree that in this case, you definitely, definitely need to get to the fairness analysis; yes?
A. Definitely need to get to it? Well, I think -- do you mean if one is dispassionately looking at the analysis, is there a case for looking at the fairness analysis? I would agree with you; and that arguably may even have been the case in the counterfactual, had Apple set a lower commission rate, and then you went back in time and looked at its financial performance under that set of circumstances.
There are some specific issues about, well, could Mr Dudney have taken different assumptions in the

creation of some of these sensitivities? Also, generally he was adopting an approach which was, you know, conservative, ie taking the higher of costs where they were available, and you can sort of have a debate about all of that. But I think even in the counterfactual, you might well proceed to consider fairness.
Q. Mr --
A. Because of the -- because of the ROCE being high, yes.
Q. Sorry to cut across you. I think a moment ago you said that the accounting evidence does not help, by itself, to determine economic value; and I think the position in your reports, at least, as I understood them, is that this stage of the analysis does not really get to grips with economic value at all, does it?
A. Well, I -- that is largely correct. When I look at economic value, I take into account a wide variety of evidence, including the comparator analysis, which no doubt we will come on to, including the analysis of some cases of Apple's own fees.
But amongst the series of issues I investigate, particularly in the context of the unfairness itself points, they do include some aspects of the degree of profitability and the degree of pricing and excessive competitive benchmark.

So while it is certainly not determinative, I think it is the case that it is one amongst the factors that I take into account, to some extent.

Q. Well, can we agree that the extent to which ROCE exceeds WACC is just not a good guide to a competitive price for this market, given what we have just looked at?

A. Yes. I think, again, there are a number of aspects that I think are relevant here. Obviously another aspect here is that one might ask myself whether the levels of ROCE are indeed so high as to indicate some issues, even in these counterfactual scenarios.

Now, I have not made that determination, and I have looked at a range of evidence, but it does at least raise some questions about whether there is a conservative treatment of what the counterfactual price would be, given these high rates of profit. I say that because, with this degree of profit, there might be a high incentive for entry and rivalry.

Q. Well, Mr Holt, looking at these different ROCEs, comparing the counterfactual with the actual, they are all very high, and so the point I am putting to you is that if you cannot tell a competitive ROCE from a monopoly one, it is just not a useful diagnostic tool for this case, is it?

A. I completely disagree with that. I think it is a very

important part of the overall assessment in order to understand whether the first limb is being met at the very at least, and then it might also be relevant, but admittedly amongst a number of other factors.
Q. But do you say that the first limb -- so would you say that the first limb would be met, even on your 10 or 15%, which you say is a competitive range, and those are very high ROCEs in themselves. So where do you say -- at what ROCE do you say: right, the first limb is met?
A. When I carried out my first limb assessment, I looked at the profitability analysis. I then interpreted that in light of a number of factors, including the context within which that profitability was earned; so in section 4 of my first report, I set out some of the competitive market aspects that related to the iOS App distribution and the aftermarket analysis. I also identified the relevance of the degree and the persistence of the profitability analysis, leading to excess. I ensured that it was important to look at various sensitivity tests and a range of different indicators.
So those, in the round, were the sets of factors that I looked at for excessive.
Would it have been possible, again, as I mentioned, looking back, to come up with these sorts of figures in

the counterfactual with a lower commission rate?
I think it very well might suggest that you would want to look further to the economic value limb; in other words, on the pure set of excessive pricing limb factors, that you might say: yes, even in the counterfactual there is at least something to explore here.

Q. Okay, thank you. Let us go to {C4/4/6}, which is the joint -- can we turn it round, please?

So proposition 6:

"Comparing ROCE to WACC can provide relevant insights into whether a price is excessive and/or unfair."

A. Yes.

Q. The final sentence of your opinion there, so you say:

"While a finding that ROCE is higher than WACC does not imply a competition problem on its own, in a market characterised by effective competition any excess returns above the WACC can be expected to be eroded over time by market entry and/or a reduction in prices."

Now, that may be true in many markets, but I think we have just seen that it is not true in this one; do you accept that?

A. Well --

Q. Because even -- sorry, let me just follow up.

A. Yes.
Q. Even with what you accept is effective competition, returns would still be many times larger than the WACC?
A. Well, what -- sorry, I think it is important to distinguish between had there been effective competition in the iOS App distribution market, compared to the approach I am taking to the excessive pricing case, which is to identify, as best I can from the evidence, benchmarks to import back to -- to Apple.
Now, I think what that is indicating, if anything, is that the benchmarks are showing that Apple could still have earned very high returns; I -- I accept that.
I think there are still then a number of possible interpretations of that evidence. One is that that is demonstrating that Apple would have been earning economic value or demonstrating economic value in earning high returns that were not being eroded over time, so that is possible. It is also possible that, as I mentioned before, there is an element of conservatism, ie that had there been workable competition or the removal of restrictions in the Apple market, that the very high returns on offer would have attracted even more entry, and then competition would have led to a somewhat lower rate.
Q. Even on your most aggressive part of the range, which is

10%, it is not true, is it, looking at Mr Dudney's calculations of ROCE for 10%, that they would be eroded down to just above the WACC; can we agree that?

A. That I agree. So the financial performance of Apple's App Store is, in a sense, so high in the actual that even a material reduction in the commission would still lead to high returns.

Q. So this is another reason, is it not, why it is very important to look at value in this case?

A. Well, I certainly do not disagree with that, because that is indeed what I have done. I think in each of -- in each of the -- sorry, let me just ...

In the actual scenario, ie looking at the actual profitability, I think my findings have been reached that there is a case for moving to a limb 2, and that is where indeed, as you say, it is important to take into account economic value.

Q. You seek to capture the demand side value primarily through your comparators analysis; correct?

A. I think primarily -- I think it is certainly an important part of my analysis. It is not the only aspect. So I think primarily it is going somewhat too far in terms of the characterisation. I have looked indeed at comparators, but I have also looked at examples from within the iOS framework, in terms of thinking about, under conditions of greater developer choice, what has Apple done?

Q. So you do make some points, if we go to your report, so {C2/10/90}. This is your third report. Thank you.

If we look at paragraph 243. Could we put this and the next page side by side, possibly, on the screen?

{C2/10/90-91}

So you make some points in paragraphs 243, and then we can move on to look at 244, about evidence from developers; yes?

A. That is right, yes.

Q. I think you have said elsewhere in your report that this is of more limited relevance as compared to your comparators analysis; is that fair?

A. I have -- I think it is relevant to the context. I have not used it in a direct sense of saying: here is what developer surveys have indicated -- developers in the iOS community indicate is their reflection of the fair commission that would apply for the services provided through the App Store. So I have not said: let us take a weighted average of those and there is the not unfair price.

But I think it is a relevant factor that sort of underpins my broader, in the round, assessment, ie it lends more confidence, I think, to the range that I have

come up with, and -- yes.
Q. All right. Let us take it then, I was hoping to short-circuit it, but let us take it. If we look at 243 first, you say that you have seen some evidence showing that some iOS App developers do not consider the level of the commission reflects the value of the services the App Store provides.
If we go back to -- can we go back to paragraph 4(a) of this report. I am afraid I do not have the reference. Mr Leith will tell me.
(Pause).
So it is {C2/10/11}. Exactly, thank you. The operator is there at the same time.
A. Yes, I see it.
Q. So we see at (iii), so you were asked to consider: to what extent, if at all, are any of the following matters relevant to an analysis of that question?
A. Yes.
Q. (iii) is:
"Views expressed by iOS app developers regarding the level of the commission."
If we go, please, to {C2/10/189} of this document. At the bottom of the page, we see documents from the disclosure that you were provided with, and we can go over the page and see the documents {C2/10/190}, and

I think over again {C2/10/191}. So it is a very small number of the documents in the disclosure; correct?

A. On the basis that it is likely that there is a large number of documents in the disclosure, I think whatever this is, 20, 30, I have not counted them offhand, it is obviously a small percentage, I am not sure that is the way in which I would sort of attach weight to it.

I think it is really understanding: what does it signify about prospective app developers?

Q. The point I am going to put to you is, when we go back to paragraph 243 on page {C2/10/90} ...

A. Yes.

Q. So the evidence that you talk about in paragraph 243 and over the page, so you give some references, and they are all references to the small number of documents that your solicitors have provided you with; correct?

A. I think that is -- that is correct, yes.

Q. So you did not review -- you did not do a more systematic review of the disclosure to see -- to have a sort of better overview of what developers might be saying; you just looked at the documents that your solicitors had selected?

A. I think that is probably not entirely accurate. I think obviously some members of my team have also looked more generally. But I am prepared to accept that these cases, which represent a number of large developers, but also references to numerous small businesses, for example, as shown at paragraph 243, have given some indications.

I have also looked at documents which relate to developer surveys; obviously -- so there might be one document, but there might be quite a lot of relevant information in one document. So I do not think the number of documents, compared to the total disclosed, is necessarily the relevant criteria.

Q. Well, Mr Holt, on any view, these represent -- these documents represent a tiny fraction of iOS developers; correct?

A. Understanding that there are many millions of developers, I think mathematically that must be correct.

Q. So you are unable to say that they are representative?

A. No, I am not saying that they are sort of representative in a statistical sense. I think they are indications, they are more in terms of the qualitative of evidence that -- obviously some of them are large and important, so that, you know, one might attach some weight to that, because they would be expected to give particular high levels of consideration to these sorts of matters. But this evidence also refers to small businesses, and wider developer surveys that, without having -- I cannot recall the precise basis on which those developer surveys will have been carried out, but again, developer surveys will be a sample and would be generally intended to try and reflect views across the community as a whole.

Q. We will look at the survey which you talk about in the next paragraph in a moment; but would you accept that developers have an obvious commercial incentive to pay less commission?

A. Yes, I think that -- I know myself that one reason why I do not put particular mathematical weight on the precise commission that the developers themselves say they think would reflect fair value is that they might be indicating to the survey organisers, or, more generally, the public domain, views that would be in their interests. So I think I am agreeing with that.

Having said that, there is quite a range given, as you can see in table 6.1, and it is not all -- if you took that incentive argument to its limit, then everyone is going to say: zero, because I would like to pay nothing. They are clearly not saying that; only 2% said that.

Q. I am coming to that in a moment. I am coming to that in a moment.

A. Okay.

Q. So you are agreeing with the incentives point; so there is an incentive to try and get commissions reduced, and that reduces the weight that you can actually place on letters to Apple saying that the commission is too high --
A. I --
Q. -- commercial negotiations?
A. I agree, and that is why I have downweighted it, in the sense that I have not taken it as a direct indication. I think it is, nonetheless, a relevant supporting source of evidence that I take into account in the round.
Now, obviously these values would be materially lower than the range I have identified if you needed to adopt that route and, as I say, I have not given direct weight to it in that sense --
Q. Then if we go to paragraph 244, so {C2/10/92}, please. So here, you are referring, are you not, to -- you are referring to the response to one question in a 2020 survey in which developers responded to a question asking them what was a reasonable commission for the service that the App Store provides; yes?
A. Yes.
Q. Did you look at the rest of the survey when you prepared your report?
A. I -- I think I may have done. It has been quite a long

time since I have looked at it; so I cannot recall, you know, what else there might be ...

Q. Do you remember, there are other questions that show that the majority of respondents reported high levels of satisfaction with the tools provided by Apple? Do you remember that?

A. Yes, I think that -- yes, that might be ...

Q. Do you want to have a look at one? So if we go to {D1/800/7}. Sorry, we cannot see what this is, I think. Oh yes, here we go. So it is Swift as a programming language.

A. Yes.

Q. There are other responses in this vein. They are of some relevance to the question of economic value, are they not?

A. Well, I am not sure I would agree with that. There is a very particular element of one -- you know, of one aspect of the overall set of services. I acknowledge here that on that particular one, and there might be others, the satisfaction level is high. But in terms of how I have accounted for this issue overall, I think it is quite difficult to sort of make any sort of particular adjustments or mathematical calculations based on these sorts of things, because, of course, in a differentiated part of the market there might be a range of potential outcomes. But there are also many dimensions of quality and different providers might be particularly good at different aspects.

In this context, obviously Apple is the one and only game in town, so you do not have that differentiation to make comparisons, as a relative sense, as to, you know, had somebody else been doing this, would the relative consideration have been higher, for example?

Q. Professor Hitt points out in his third report, I do not think we need to turn it up, but do you remember he points out that there are other surveys indicating that developers have similar complaints about the commissions of other platforms; so for example, he points to the fact that there is survey evidence that shows that only 27% of developers view Steam's 20% commission as being a reasonable rate.

So if you are going to be looking at survey evidence, you do need to contextualise it, do you not, and look at what -- look at other surveys to put this into context?

A. I think it potentially would have been helpful to refer to developer perspectives on the other benchmarks, because that might perhaps have also given you some indication as to what the thinking was in those other cases. But obviously, in terms of the direct perspective from developers within iOS, I think this is the most direct indication as to what their perspective was.

Again, I have downweighted it because of the incentive point that Ms Demetriou has highlighted; but again, that incentive point would only go so far. They are clearly not indicating, you know, the very lowest possible level of commission. They clearly are spread out across a range of values. That does suggest to me that they have given some actual consideration to what the value is that they are getting and given a considered answer to that; and it is actually lower than what my range is.

Q. You are downrating it for the commercial incentives point, because what this survey evidence tells us is that developers would like to pay less commission, and that is unsurprising, is it not?

A. Well, I am not with you in the sense that I have given it zero weight, because the mere fact that they would obviously like to pay lower incentive -- sorry, they may have an incentive to pay a lower commission, would invalidate all of these results.

I am saying that that might be a factor that may have affected what their responses were. Obviously it would depend on how strong a link they thought their answer was to the eventual outcome. If they thought there was a very strong link, then the incentive would be particularly strong. If their answer was one amongst many, and they did not know in what sense was this going to be used in any event, and it certainly is not the case that Apple is doing this survey and then implementing these results, then that actually takes a -- you know, there is quite a remoteness between what they are saying and what the actual outcome would be. Again, they are not going for the lowest. They are giving a considered view across a range.

So I think I have recognised that there may be an incentive in that direction, but it is -- but the way -- sorry, the concern with that incentive, in my view, is substantially less than is being postulated.

Q. I mean, in general terms, you do not really approach pricing, do you, by asking how much customers want to pay? Because the answer is always going to be less. Is that how you would go about establishing a fair price, asking the customers what price they would like to pay?

A. Well, I think this question is not: what would they like to pay? This is: what do they think is a reasonable amount of revenue share, given the services? It is a very -- it is not so much: would you like to pay zero? It is: you take into account your perspective on how you

are using the App Store and what services you are getting, and what do you think that is worth? It is not quite -- it is certainly not: would you like all the services and to pay nothing for it? No one is answering it in that way.
Q. I think it is fair to say you rely much more heavily on your comparators analysis to capture demand side value than these paragraphs of your report; correct?
A. In terms of the more specific numbers in my range, I think that is fair; but the range is not -- it is sort of an in the round assessment based both on comparative evidence, and a range of other evidence, of which this is sort of one part of that. But it does not mechanistically translate from a weighted average of these developer perspectives on value to my range, that is fair.
Q. Okay. Let us go to {C4/4/3}. This is the joint expert statement again between you and Professor Hitt.
Paragraph 13, do you see there is a heading:
"Key areas of disagreement ..."
A. Yes.
Q. On issues 5 and 6. So I just want to look at b, so 13b:
"What the App Store commission rates compensate Apple for ..."
It says:

"In Mr Holt's view, the focus of the proceedings is on the App Store and Apple's conduct relating to the App Store. Therefore, an assessment of whether Apple's commission rates are unfair must focus only on the value of App Store services."

By that, by "App Store services", you mean the services to developers of the matchmaking, having their apps marketed on, and downloaded from, the App Store and the payment transactions process; yes?

A. Yes. I think that is -- essentially the way I have approached this is to say: first start from the market definition and the focus of the proceedings; that is on the iOS App distribution market and the aftermarket.

Let us look at what is a -- well, firstly, obviously you have to look at the first limb analysis, but I think we have moved beyond that now. Let us look at the -- what would be in excess of -- sorry, not excess of, or at least not unfair price.

I have then looked at the evidence in that regard. I have also examined some of the documents that --

Q. Mr Holt, I am really sorry. I do not want to cut you off, but I have limited time, and there will be an opportunity to explain in more detail, which you have done fully in your reports anyway. But I was just trying to establish what you mean by "the App Store services" and my question was: by that, do you mean the matchmaking, the downloading, the payment processing, and so on?

A. Yes, yes, I --

Q. The --

A. Yes, that is correct. I will not expand. What I was going to say is: how do I take into account the IP, but I think that --

Q. We are going to come to the IP, I promise. Then we see:

"In Professor Hitt's view, the commission Apple charges should compensate Apple for providing all the products and services -- including iOS tools and technologies -- that contribute to the value consumers and developers derive from the iOS ecosystem."

So he says that his position, on Apple's case, is that Apple's commission -- the question of whether they are unfair must account for the economic value that is conferred on developers through Apple's proprietary technology. You understand that is the debate between us; yes?

A. Yes. I do, yes.

Q. Now, your reason, at least stated here, but we are going to come on to this in more detail, you have not investigated, have you, the additional value that Apple confers on developers and users, through its tools and

tech; correct?
A. I have -- I think it is fair to say: I have not added an increment to my assessment of workably effective competition to account for that, and I have the -- I have a number of reasons for that.
Q. All right. We will come to the reasons in due course. I am just setting the parameters at the moment.
A. Okay, yes.
Q. Now, let us look at what Dr Singer said when he gave evidence. If we go to {Day14/100:1}. I want to show you two things he said, and then I will ask you whether you agree.
The same thing he said, so {Day14/100:1}.
(Pause)
Ah. There is a slight delay. Is the whole of Opus down?
THE CHAIRMAN: My transcript seems to have stopped as well. I do not know if anyone else's has.
A. I am happy to just hear what he said, and then --
MS DEMETRIOU: Shall I say -- unless it is a problem with not having the transcript.
THE CHAIRMAN: Well, if Mr Holt thinks he has a problem, he will say so. Why do not you --
MS DEMETRIOU: No. I mean, Mr Holt's evidence is not going to be on the transcript. Oh, it will be.

They are very short points anyway.

A. Yes, sure.

Q. So the first point, he said that:

"The first point is that there is tremendous value to the Apple ecosystem, even at the 30% tax. How else can you access if you are a developer? How else can you access this subscriber base if not through the App Store? So tremendous value."

Then he said separately:

"I do not dispute there is still value. Even at 30% there is a lot of value to developers. The only question in my mind was: what would the commission be, in the absence of the restraint?"

So do you agree with Dr Singer that, at the 30% commission, there is still a lot of value to developers from being provided by Apple?

A. Well, partly, but not entirely. It depends on what is your precise definition of "value" and, specifically, what is the relevance of that value for the unfair test?

I do agree with him, and no doubt Apple, in the sense that developers are keen to participate in the iOS ecosystem; and the iOS ecosystem is very successful and has a lot of device users and that the amount of billings has grown extensively.

I do not agree -- and sorry, before I say anything further on that. The 30% tax obviously has, nonetheless, attracted a lot of developers. There is no doubt. In other words, there is high -- there is clearly, in a sense, high willingness to pay to be a developer on the App Store.

Now, you could say: well, that high willingness to pay also already reflects how strong the value is, and therefore 30% is fine.

My framework says: that is incorrect, in terms of how you engage on this. You need to distinguish between willingness to pay, particularly in the context of a non-contestable market, and what can reasonably constitute economic value. It is not willingness to pay or the desire to access the iOS user base; it is, in my framework at least, linked to: what would you reasonably expect to pay in a workably competitive market?

Q. Just on willingness to pay; so your point on the willingness to pay fallacy is that you cannot necessarily equate what developers are willing to pay with the price being fair; correct?

A. Correct.

Q. But it would be overstating it to put the proposition the other way around. It does not follow, does it, that the fact that developers are willing to pay this amount, it does not follow that that cannot represent the value of the product?

A. Yes, I --

Q. So you would accept that?

A. I accept that, because if that were the case, then every price would always be not -- be unfair, and I am not saying that.

Q. Exactly. Now, you have also seen, I think, that Dr Singer accepts that Apple monetises its tools and tech, in part through its commission. Do you want to see the joint expert statement where he accepts that, or do you remember?

A. I do remember that.

Q. That is not a question that you have investigated yourself; correct?

A. No. I know that Mr Howell has, sort of, tried to opine on this by saying, in his view, and I am not the industry or factual witness, or industry expert here, but in his view it is actually quite difficult to link the particular elements of the monetisation strategy to the individual services and tech that each of them provides; but that once you sign up to the app developer program, you are able to access all the IP and tech. Moreover, I think -- is it section 8, something like that, of the DPLA, he indicates that the $99 fee is identified as consideration for access to some of these licences.

Now, I do not have -- I am not making those statements because I am supporting them. I am just noting that that seems to be Mr Howell's view. I am aware that Apple has alternative views and Professor Hitt has also said: no, it is for everything else.

But in my excessive and unfair pricing framework, it is actually not relevant.

Q. So you have proceeded on the basis, have you not -- actually, let me take this in stages.

So we have seen that Dr Singer accepts that Apple monetises its tools and tech, in part, through its commission; so not just the $99 fee. You have noted Mr Howell's view, but this is not a debate that you have entered into in your reports; correct?

A. I do not think that is accurate, to the extent that I have engaged on essentially this debate in the context of: if you did set a 15% commission, as the basis of revenue -- of an unworkably effective competition -- sorry, commission rate, would there be a case for additional fees reflecting the tools and tech?

Q. That is fair, you have, and I am going to come on to that, I promise. In fact, let us come on to it very quickly. I put this to Dr Singer. Did you see any of

the transcripts of Dr Singer's evidence?
A. I have heard some of it, and seen aspects, but if you could -- if you provide the high level summary, it will help me decide --
Q. Can you tell me yes or no. It is just helpful to know in general, because there are lots of points I can take more shortly. If you say: well, I have seen those, just as we go through.
But let me take this in stages. So the point, the question I put to Dr Singer is this. So if a developer were to distribute its iOS App through an alternative app store, so one of your comparators.
A. Yes.
Q. Then that developer would need permission from Apple to use Apple's intellectual property to create and publish its app; yes?
A. Yes.
Q. Also, the same point can be made in respect of a competitor app store. So if you have a competitor app store that wants to present as an iOS App and compete with the App Store, that competitor app store would also need permission, a licence from Apple to use its proprietary technology; correct?
A. Correct.
Q. In return for granting the developer a licence, Apple

would be entitled to charge the developer a fee on the revenues that the developer earns, using Apple's proprietary technology; yes?
A. Yes. I think -- I think there obviously then needs to be an investigation as to: on what basis is that being said and how does it affect the overall assessment of fair value?
Q. We will come to that, but I am just now taking it in stages; but you accept that. In fact, if we go to your fourth report, so {C2/11/23}.
A. Sorry, perhaps I can just sort of correct. What I agree is that Apple may be conferring some IP, and that Apple obviously needs to be able to monetise its IP --
Q. Yes, and so --
A. -- and whether that then means that a higher commission or a higher new fee could be levied is something that I do not agree; that point.
Q. We will come to that stage, but what I am trying to work out at the moment is at what stage you are disagreeing with me, so I am trying to see: where do we part company in the analysis. So I think we have agreed so far that the developer, or the developer per(?) app store, would need a licence from Apple. We have agreed that, in principle, Apple is entitled to charge a fee to the developer, on the revenues it earns, using Apple's IP;

yes?

A. Well, I think -- I think I have only a limited ability to accept that, because it depends on what the implications of that would be, relative to my fairness assessment.

Q. All right. Well, let us look at what you have said here on this page in your report. So at subparagraph (e), you talk about:

"Epic's 5% royalties on the Unreal Engine."

Now, Unreal Engine are some tools for game makers that Epic provides; yes?

A. Yes.

Q. I think we can all agree that, in terms of scope, they are vastly less, they are vastly smaller in terms of scope than the tools and tech that Apple provides?

A. Yes.

Q. You see that Epic charges a 5% royalty, although it waives it for distributors that use its platform.

A. Yes.

Q. You say there, at the end of -- the last sentence:

"If Apple wished to charge a separate fee for use of individual technologies such as its 'Metal' graphics APIs -- as Professor Hitt suggests -- it would be free to do so, as long as it did not extract an unfair price for them."

Yes? So that is what you have said in your report?
A. Yes, yes.
Q. So you are accepting that Apple is not required to license its IP for free; yes?
A. I am not making that statement, no.
Q. No. I think you would accept that it is not limited in law to charging its $99 per developer fee in the developer program; yes?
A. I am not making that statement either, no.
Q. No. The question as to what is a fair or unfair price for Apple to charge for its intellectual property is not one that you have investigated, is it?
A. Sorry, I think I may need to hear that question again. The question as to what would be a fair or unfair charge for ...?
Q. For Apple's IP. So Apple is entitled to grant a licence. Apple would have to grant a licence. Apple can choose whether to grant licences to its IP. Developers would need a licence.
The question, you say here that Apple is entitled to grant -- to charge for use of its technology, such as its "Metal" graphics APIs, just as the Epic Games Store does with Unreal Engine. Then you say: free to do so, as long as it does not extract an unfair price for them.
My question to you is: you have not examined, have

you, in these proceedings, in your reports, what is a fair or unfair price for a licence to Apple's IP?

A. No, I have not done that; with the exception of having indicated that when you look at the benchmark that I am using, the unfair test to indicate, you need to take into account a number of factors. One is the monetisation approach that is consistent with competitive -- workably competitive evidence, and other similar ecosystems.

So my approach to dealing with this, and forgive me if I am jumping ahead to the -- how I am actually dealing with the IP, but I think it is helpful perhaps for the Tribunal to understand it, is that I am saying: look, there are a number of advantages that granting IP from Apple to developer, third party developers, creates. Without that, there are no apps; there is no commission; and there is no contribution to the ecosystem, in terms of third party apps, which, without that, Apple would obviously be in a very difficult position vis a vis Android.

So that is one proposition: that it is common, when granting IP to developers participating in an ecosystem to create content, for that IP to be granted in a charging structure which focuses on commission and a program fee. That is the case for Apple at the moment. It is the case for Microsoft, which does not provide -- sorry, it does provide IP in the form of APIs to allow developers to create games and other types of programmes for the PC environment, accessing PC functionality, accessing Windows functionality. Google itself in the Android system confers, or grants, IP again to developers for the very same set of reasons: that it is advantageous to the ecosystem and it monetises that through a commission.

So what I am saying is that when I use the effectively workable competition standard, I look at not only the level of the commission, but also the structure of the charges which underpins it.

Q. Right. So I think you say that you accept that Apple is entitled to grant -- to monetise its IP through a commission; yes?

A. Yes.

Q. But you have not looked at what would be a fair commission for it to charge; correct?

A. Well, I have; because I have looked at, firstly, what a fair rate would be in the iOS and aftermarket -- sorry, the app distribution and aftermarket level.

Q. Do you mean your comparators?

A. Comparators, but I have then --

Q. Just pausing there, sorry. You go ahead, and then

I will come back to that.

A. Sure. I have then recognised that, yes, IP is granted and is there a basis to say that there is a need to reflect something further? My answer to that is: no; first, because even at the 15%, and whether it is because it is very -- conservative or because it is already reflective of economic value, that is conferring billions of dollars per year to Apple to recoup some of these IP and tech costs. So there is already a very large contribution that is separate to the app developer fee, the $99, and it is also separate to the general contribution that is made by the developer community to the success of the iOS program.

Q. Mr Holt, thank you. I am going to ask two follow-up questions and then I see the time and we can come back to it.

But you understand, do you not -- your first point was your comparators point.

A. Yes.

Q. You understand, do not you, and we will come back to comparators on Monday, but you understand that Apple's case is that none of the comparators you rely on for establishing the competitive price are in a comparable position, in fact, because none of them provide a licence to use Apple's proprietary technology and that

is why they are not good comparators. So you understand that is our case, and we will come back to explore that?
A. Yes.
Q. But on your second point, which is taking in the round that Apple earns a lot of money on its devices; but you are not saying, are you, that it is therefore not entitled to charge developers to use its proprietary technology, are you; but you have accepted that they are entitled to charge developers. So then I am not seeing the relevance of the fact that it may earn a lot of money in the devices market, which is a competitive market.
A. What I am saying is that the balance of fairness, which is identified in workably competitive markets and a range of other operating systems and other ecosystems, indicates that once you have a structure which identifies a workably competitive level of commission and, if necessary, and some of the cases have it and some of the cases do not, an app developer fee, then you do not see a supplementary IP licence fee being imposed.
I think the reason for that is that without that IP being granted, there is obviously a serious detriment to the overall ecosystem; and also the contribution that I was referring to in the billions was not limited to the device contribution; it is also the ability to

recoup the commission-based operating margins, which add up to something like 15 billion, plus or minus, by 2023; and obviously there is a lot in the -- and in the prior years as well.

So it is the context of the amount of contribution that the developers are already making in the counterfactual, through both the app developer fee, the commission and the contribution to the ecosystem, plus the fact that when you look at workably competitive alternatives, the general structure in these things does not suggest additional IP-related licensing fees on top of all those other sources of revenue.

Q. Yes. I have a follow-up question, but I can save it until Monday if you like.

THE CHAIRMAN: I do not think we mind if it is only a couple of minutes, so if you want to ask it now, please do.

MS DEMETRIOU: Thank you.

I think, Mr Holt, the last point that you made, which is that this is not a thing that really happens, is inconsistent with what you say in this part of your report about Epic's Unreal Engine; correct?

A. No, that is incorrect. Epic, when it is conferring the IP of the Unreal Engine off-platform, out of the ecosystem that it operates, that is when it charges a royalty. That makes entire sense. If it is conferring the IP within the ecosystem, which it does when it does so to developers using the Epic Games Store, then there is no incremental fee for that.

Q. So are you saying that in the counterfactual, Apple would be entitled to charge a fee for its IP to listed app developers that use competitor app stores? You are accepting that on the basis of Unreal Engine?

A. Well, that is a slightly more complicated question, because in Epic the case is very clearcut. You are either in the ecosystem or you are not; ie if you are on Epic Games Store, you are in the ecosystem and you get it for free; similar to Microsoft, similar to Android, and so on. If you are not, then why would Epic want to give you the IP, if then the game is going to be put on a games console, for example? Epic has got absolutely nothing to do with that, so it makes entire sense that in such cases, there needs to be an alternative source of monetisation.

Q. Well --

A. In the App Store case -- I am sorry -- it is less obvious. The IP is still within the iOS ecosystem, so there is still at least some advantage to having competitive apps within the ecosystem; so that is a distinction that I think that is potentially relevant.

Q. I am just looking as well at this page, at

subparagraph (f), because you talk about Sony's cross-platform royalties. Sony reportedly charges developers royalties on revenues that the developers earn on platforms outside the Playstation store.
A. Yes.
Q. Professor Hitt gives some more information about the way in which Sony charges for its IP.
A. Yes.
Q. So just going back to my question. Do you accept that in a counterfactual, where there are competing app stores, if a developer places its game, for example, on a competitor app store, Apple would be entitled to charge a fee for that developer to use its tools and tech?
A. I think I -- I can see the case for that, subject to the overall outcome of that process, not leading to a fee that is above an unfair price. Just to correct the Sony reference: again, that is a distinction between within and outside of the platform, so that does not contradict my point.
MS DEMETRIOU: All right. I think, sir, we can leave it there and I will have to return to this topic briefly on Monday.
THE CHAIRMAN: Very good, thank you. It has been a long week, so I think we are all ready for the weekend.

Good. Mr Holt, you know the rules about not --

A. I do.

THE CHAIRMAN: Sorry it is over a weekend, but hopefully you will find some other things to do than to worry about this case.

We will see everybody on Monday morning at 10.30. Thank you.

(4.37 pm)

(The hearing adjourned until 10.30 am on Monday, 10 February 2025)

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