IN THE COMPETITION APPEAL TRIBUNAL Case No. : 1382/7/7/21

Salisbury Square House
8 Salisbury Square
London EC4Y 8AP

Monday 6th October 2025 – Tuesday 4th November 2025

Before:

Mrs Justice Bacon

Derek Ridyard

Justin Turner KC

(Sitting as a Tribunal in England and Wales)

BETWEEN:

Consumers' Association

Class Representative

v

Qualcomm Incorporated

Defendant

A P P E A R AN C E S

PHILIP MOSER KC, ROB WILLIAMS KC, MICHAEL ARMITAGE, CIAR MCANDREW, CHARLOTTE MCLEAN, DANIEL ALEXANDER KC and DAVID IVISON (Instructed by Hausfeld & Co. LLP) on behalf of Consumers' Association

DANIEL JOWELL KC, NICHOLAS SAUNDERS KC, DAVID BAILEY, SOPHIE BIRD, CHARLES WALL, ALEXANDRA BRECKENRIDGE (Instructed by Norton Rose Fulbright LLP and Quinn Emanuel Urquhart & Sullivan LLP) on behalf of Qualcomm Incorporated

Monday, 20 October 2025
(10.30 am)
MR WILLIAMS: Madam, members of the Tribunal, Mr Noble is here to give his evidence.
Could we please bring up {EAOE/17/1}.
THE CHAIR: Is he being re-sworn?
MR WILLIAMS: Well, that is perhaps a good point. I am sorry, perhaps I will --
THE CHAIR: I think he should start off by being sworn. He should then go through -- I know that they were sworn for the purpose of the hot-tub, but they should do it now.

MR ROBIN NOBLE (sworn)

Examination-in-chief by MR WILLIAMS

MR WILLIAMS: Mr Noble, can you see the screen?
A. Yes.
Q. This is your seventh report in the proceedings, is it not?
A. Correct, yes.
Q. Can we please turn to page 40 {EAOE/17/40}. Is that your signature?
A. Yes, it is.
Q. Can we please bring up {POE/21/1}. This is your eighth report?
A. Yes, correct.

Q. Can we please turn to page 106 {POE/21/106}. Is that your signature again?
A. Yes, it is.
Q. {POE/23/1}. (Pause)
THE CHAIR: Are we having problems bringing up a document?
EPE OPERATOR: (Inaudible).
MR WILLIAMS: Here it is. This is your ninth report. If we turn through to page 54 {POE/23/54}. Is that your signature again?
A. Yes, it is.
Q. Then, last of all, {IRE/28}. This is your tenth report and if we could turn through to page 7 {IRE/28/7}, your signature again?
A. Yes, correct.
Q. Then, finally, {POE/24}. This is the joint statement prepared by yourself and Dr Padilla and on to page 2 {POE/24/2}. Your signature is there?
A. Yes, correct.
Q. Does the content of these reports and the joint statement, as contributed by you, represent your true and complete professional opinion?
A. Yes, subject to the corrections that were highlighted, I think, when we started the hot-tub.
MR WILLIAMS: Thank you. There will be some questions for you.

Cross-examination by MR BAILEY

MR BAILEY: Good morning, Mr Noble. Good morning, members of the Tribunal.
Can I just start by explaining the running order. So I will start and ask you some questions about dominance and then my learned friend Mr Jowell will ask you some questions relating to abuse and the effects of the conduct and then, lastly, Mr Saunders will address you on leveraging.
THE CHAIR: Can I just clarify there is not going to be any overlap between those issues? I do not want the same questions or more or less the same questions being put several times to Mr Noble.
MR BAILEY: No, Madam, we have absolutely sought to ensure there will be no repetition.
THE CHAIR: So dominance, abuse and the leveraging analysis, or the empirical analysis of Dr Padilla.
MR BAILEY: Yes, Madam, that is correct.
In terms of confidentiality, I will be starting in open court for the first half and then I will need to move into private session where I then group all of my questions relating to confidential matters at that point.
THE CHAIR: All right. You will finish by a little bit before 1.00 so that there can be time for

re-examination, if necessary.
MR BAILEY: We will do our level best to do so.
THE CHAIR: Yes. We have half a day with each of the witnesses.
MR BAILEY: Mr Noble, I am going to focus on the end of market power in your LTE markets and the point at which you think market power began in 5G. I am going to start with Samsung and look at the market position between 2016 and January 2018, when the 2018 amendment to Samsung's licence was negotiated.
I would like to start, if may, with the data and what it tells us. Can we go to {ORI/261.8/1}. While it is being brought up, this is a spreadsheet of the figures that underlie figure 7 in Dr Padilla's fourth report. In your hard bundle, it is at tab 3. It sets out the share of Samsung's purchases. I want to focus on the period Q1-2016 to Q1-2018. It is {ORI/261.8/1}. It is figure 7, so the other tab, please. Go down to Q1-2016. Can you see, Mr Noble, that the figures there in the second column show Samsung's purchases for Qualcomm at 58% in Q1-2016? Do you see that?
A. Yes.
Q. Row 51. Thank you.
A. Yes.
Q. If we go down to see how it changes, to Q1-2018, do you

see that it has decreased to 26% in row 60?
I apologise, row 59?
A. Yes.
Q. If we look then at the third column and see what happened in the same period to Samsung Exynos, if we go back to Q1—2016, please, so that is row 51, do you see it was 36% back in 2016?
A. Yes.
Q. Then the data we see that the share increases, does it not, in Q1—2018, to a share of 61%. Do you see that?
A. Yes.
Q. Given those shifts and share of supply to Samsung, you would accept presumably that Exynos and Qualcomm were effectively competing in supply of chipsets to Samsung between 2016 and 2018?
A. Well, there certainly seems to have been a degree of switching by Samsung from one to the other.
Q. Yes. The switching obviously would therefore imply that there was competition between Exynos and Qualcomm for the Samsung socket during that period?
A. It certainly appears that for some sockets that Samsung felt comfortable that it could use Exynos, as opposed to Qualcomm, or any other supplier.
Q. Yes. Although it is not just some sockets, is it, because we see it actually goes from 2016 Exynos had

36%, and it goes up to 61% in 2018 so it is quite a significant increase, is it not?
A. Yes, it is a significant increase.
Q. I am grateful.
I am going to move to LTE—CDMA and I am going to go through, as you do in your markets, by type of chipset. So I am going to start with LTE—CDMA. Can we just recall, please, during the hot—tub, and in case you want to look at it, it is {Day7/170}, and I just tell you this is where Mr Ridyard asked you a question about whether prospective market power might work in reverse. So, in other words, where a firm thinks in six months to two years' time it will have its own supply and will be freed from any dependence on Qualcomm and you agreed with that idea, as a matter of concept. Do you recall that, sir? It is the bottom here. You will see that Mr Ridyard asked you, line 22, {Day7/170:22} and then over the page you will see your answer.
A. Yes, I recall that exchange.
Q. What I would like to do —— let us give that a label: "the concept of market power weakness". Excuse me, "concept of prospective market weakness". I would like to look at how that concept applies in practice. So can we go, please, to {POF/649/6}. This is a document, a Samsung document, where we must not refer

to the information in grey and it is, as you can see from the title ——
A. Sorry, which hard copy is it?
Q. So it is tab 47. It is a document that is setting out Samsung's plan for securing a CDMA solution. We can see from the top right—hand corner, March 2016 is the date of the document. Do you see that?
A. Yes, I see that.
Q. So can we go over the page, please {POF/649/7}. You will see there is a big grey box and I want to focus on the sentence above it. There is a bullet point that says:
"So as respond to the expanding request for CDMA, S. LSI... "
That is Samsung's own in—house business, is it not,for chipsets? You are nodding, sir, but ——
A. Sorry. Yes, it is.
Q. Thank you.
"So [Samsung] LSI also plans to gradually secure a CDMA solution (Two—Chip solution in 2017 [and then a] One—Chip in 2018)."
So this document suggests, does it not, that Samsung was going to develop its own CDMA chipsets, either two chips in 2017 and then finally its own in 2018, do you agree with that?

A. I would agree that it appears to be planning to do so.
Q. Yes. So if we just use the logic you discussed with Mr Ridyard, any CDMA market power that Qualcomm might have had would have been diminishing, would it not, as soon as Samsung believed that it would obtain a credible alternative source of CDMA chipsets in one to two years' time from the date of this document?
A. Well, if we think about market power in the sense we use it in this case, there is —— it depends which part of the allegation being made by the Class Representative we are looking at. There is two ways in which an OEM may wish to have chips. They may wish to have them now because it is currently making phones in its current supply chain and it may also wish to have them in the future because it is planning its next round of phones. So the concept of prospective market power and this new concept of I think what you called "market weakness" in a sense applied to that future need. They do not apply, obviously, to the current need because that is the chipsets you are currently using.
Q. Just to clarify, and focusing on prospective market weakness, would you agree that insofar as this document is showing Samsung's plans, that in the foreseeable future any market power that Qualcomm would have would be declining from this date onwards in light of these

plans?
A. It would certainly be the case that Qualcomm would have less market power once Samsung is comfortable that this sort of solution is going to work than, you know, prior to the position it would believe that such solution would work, yes. I would agree with that.
Q. We can see that -- I am not going to traverse the facts in the grey box with you, but that sets out some of the detail, but I would like to just ask you to note, because it is relevant for later on, the penultimate bullet in the grey box, please. Could you just note that. It says "pursuing to" and then just read the rest of that line and I am going to come back to that, if I may, later on. Do you see that, "pursuing to embed ..."?
A. Yes, although I was not quite sure I understood the context of that, but perhaps that will become clear.
Q. Do not worry. I will come back to it, I promise.
Can we look at another document, please, at {POF/653/7}. I just want to see -- you said in the hot-tub:
"It depends what the OEM does with the knowledge about future supply."
A. Sorry, which hard tab?
Q. Tab 48 and it is an internal Qualcomm email in March

of 2016, the same month we have just been looking at, and it is reporting on a meeting with Samsung procurement. I just want to take you to one part of it, if I may, and that is to be found on page 9 {POF/653/9}. The bit I want to ask you about is you will see under the heading, "CDMA Pricing Strategy", halfway down, it says --
A. Yes, I see that.
Q. "Samsung requested to reduce CDMA premium adder referring to Samsung's S.LSI's recent activities with VIA."
Now, VIA, that was a firm that had CDMA technology, was it not?
A. Yes.
Q. Yes. So what this shows, does it not, is that in 2016, Samsung was putting competitive pressure on Qualcomm to bring down its CDMA prices by referring to Samsung-Exynos activities with VIA. That is right, is it not?
A. Well, I think it says that they asked for it. I do not know whether it shows that they definitely exerted pressure on them. They certainly requested it and --
Q. Yes. You can see that Samsung is using it to play off Qualcomm against Samsung LSI and its activities with VIA; yes?

A. It certainly seems as though, you know, that is the tone of the conversation.
Q. Then do you recall, sir, in your ninth report, and we can turn it up if you wish, that you say there that Samsung had the ability to self-supply LTE-CDMA chipsets in 2018 and that is at paragraph 2.31, if you wish to look at it.
A. In the ninth report?
Q. Your ninth report {E/23/15}. I am just simply referring to what you, sir, acknowledge, in the last sentence there:
"I note that Samsung was eventually able to self-supply LTE-CDMA."
Do you see that?
A. Yes, I do.
Q. Do you recall that in the joint expert statement you accepted that Qualcomm no longer had significant market power for LTE-CDMA chipsets once it had the ability to self-supply those chipsets?
A. Can we just --
Q. Of course. It is paragraph 37.1 and it is {E/24/22}. What I would like to do is join the dots between what you say in your ninth report and what you say in the joint expert statement.
So if you have the joint expert statement in front

of you, you will see that you are talking about:
"Qualcomm held particularly significant market power with respect to ... "
You go through various types of chips. You say in relation to LTE-CDMA, about six lines down, that it had it from 2009 until around 2017/18, and then in brackets you say "after which point" and we will focus on "Samsung was able to self-supply". Do you see that?
A. Yes, I see that.
Q. Just to join the dots, do you accept therefore that Qualcomm ceased to have particularly significant market power with respect to LTE-CDMA chips from 2018, the date at which you identify Samsung had the ability to self-supply?
A. Can you ask the question again, sorry, so I can be clear.
Q. Essentially what I am asking is when you say here that Qualcomm would no longer have significant market power with respect to LTE-CDMA chipsets from 2018, is that because that is the date when Samsung had the ability to self-supply?
A. So it may still be the case that Qualcomm has some market power. I think what I am highlighting here is that by 2018, a number of factors have changed and you have the two largest OEMs having alternative sources for

CDMA chipsets and so that does raise a question mark about how strong that conclusion of market power would be. It is certainly weaker at that point than it was in earlier years.
Q. Yes. Although you are not saying it raises a question mark in the statement. You are saying it had particularly significant market power with respect to CDMA—LTE chipsets and you say to around 2017/2018. What I was trying to do is to pin down precisely that the date at which it ceased to have particular significant market power for those chips was when Samsung had the ability to self—supply, which you identified in 2018.
A. Well, I think it is quite difficult in this case to draw a bright—line and say on this specific date, you know, one day before it had market power and then one day after it did not. I think that is just inherently very difficult in this particular case and that is why I used this particular form of words here, which is Qualcomm —— so I am talking in the positive here —— held particularly significant market power and then I am talking about up until 2017/18.
Q. You say "until around". I take your point about it is a question of degree and it changes over time and you give, to be fair, 2017/18. I was going to ask you about that, whether you accept that given Samsung knew, as we

have seen, it was developing its own supply of CDMA chips, you would accept that, as you say, market power is a question of degree so it was declining in 2017 in the run—up before Samsung started to self—supply in 2018?
A. Well, if we go back to the distinction I drew between the future chips and the current chips, in a sense for the current chips it does not change until you can actually provide them to yourself and for the future chips, it changes at the point that you are sufficiently confident that you are going to be able to supply those chips to yourself.
Q. But you cannot say with any confidence that Qualcomm would have significant market power from 2018, can you?
A. It is certainly much less clear.
Q. Yes, much less clear and therefore you cannot be confident?
A. The confidence level goes down, yes.
Q. I would like to turn to LTE—UMTS chipsets, please. You explain in the joint statement, at page 16, that Samsung had the ability to self—supply UMTS chipsets from 2010 onwards. Do you see that, the first line of 29.1?
A. Sorry, which —— 29 ——
Q. On page 16. It is on the screen in front of you if that helps {E/24/16}.

A. Sorry, yes, I have that.
Q. Yes. So it is common ground between us that that is when it had self—supply of UMTS, chipsets from 2010 onwards; yes?
A. I think the chronology is that they —— in 2010, they have engineering ability to do it, but I do not think they actually supply commercial volumes until 2011, but it is ——
Q. Well, I was just going on what you said in the joint expert statement but if you —— let us have a look at the data again, shall we? The Class Representative has prepared a table on LTE chipsets which I think you are familiar with. That is at tab 5 of your bundle. For the Tribunal, it is {ORI/261.15/1}. This is a table that sets out shares and volumes for LTE chipsets supply. I would like to focus on the percentage row for shipments by Samsung to itself. So that is basically four rows up from the bottom. Can we look, please, at the position in 2016. Do you see that is 42% Samsung to itself?
A. Yes.
Q. Then we go ahead to 2018 and it has gone up to 66%, has it not?
A. Yes.
Q. If we look at the contrasting fortune for Qualcomm, in

2016, it was 52%?
A. Yes.
Q. It has fallen, has it not, to 26% in 2018?
A. Yes.
Q. So these figures suggest, do they not, that Samsung's in—house supply of LTE chipsets was a credible alternative for Samsung between 2016 and 2018?
A. Well, a little like the exchange we had earlier, it certainly indicates that, as the slots have come up for, you know, the 2017 and 2018 handsets, that Samsung has felt comfortable to use its self—supply Exynos option, rather than Qualcomm or any other chipset for those.
Q. Yes, so if you feel comfortable to use a Samsung chipset in a Samsung socket, you would obviously regard it as a credible alternative, would you not?
A. For those specific handsets, yes.
Q. Yes. I am only focusing on those particular years that are relevant.
A. But there is still a question mark about the volumes that do not switch, because there is a question mark about, well, what inference do you draw from that? Do you draw, for example, the inference that those are the volumes that Samsung did not feel confident about switching away to either itself or to some other OEM?
Q. Yes. I am focused on those where they did switch and

specifically that that tells you, does it not -- it is a "signal", to use your wording from the hot-tub, that Samsung regarded Exynos as a credible alternative for LTE-UMTS between 2016 and 2018, otherwise it would not have used it, would it?
A. Certainly for the phones where they used it, yes, they do appear to have considered it a credible alternative, yes.
Q. I would like to turn to 5G, if I may, and to pick this up, just to set the scene, can we look at your eighth report, please {E/21/69}. It is at paragraph 3.89.
A. The eighth report?
Q. Your eighth report, that is right.
A. Which paragraph?
Q. Paragraph 3.89. You say here:
"Samsung and Apple are sophisticated customers..."
I think we can agree about that:
"... with well-informed expectations as to the relevant chipset markets, and were therefore able to anticipate that Qualcomm would occupy a strong position as a supplier of LTE chipsets and 5G chipsets."
Do you recall that?
A. Yes.
Q. Do you recall that in the joint expert statement you say that Qualcomm had market power in 5G from around 2018?

A. Yes.
Q. For the tribunal's note, that is at paragraph 37.1 again at {E/24/22}.
Now, you accept, do you not, Mr Noble, that the parties' expectations about the strength of Qualcomm's future position in 5G, those are factual matters, are they not?
A. Yes.
Q. Yes. You say that in paragraph 27 of the joint expert statement.
You nonetheless do discuss in your report some of the evidence and discussions between Samsung and Qualcomm. I would like to look at that, if I may. Can we go, please, to page 67 in your eighth report?
A. Sorry, page 67?
Q. Page 67. I want to look at, in particular, the end of paragraph 3.83 and then there is some confidential marking in 3.84 {POE/21/67}. You are talking about Samsung and 5G and you are saying here:
"[It] appears to have been constrained by a continued reliance on Qualcomm's chipsets for flagship devices in key geographies."
Then in 3.84 you elaborate upon that, citing various bits of evidence. Do you see that?
A. Yes.

Q. Yes. You cite at the end of that, in footnote 215, four documents. How did you identify those particular documents?
A. How did I identify those?
Q. Yes, why those as opposed to any others?
A. I mean, we -- I and the Oxera team reviewed a large number of documents so I do not recall specifically how we identified those four.
Q. So you looked at a large number of documents. Did you review any other documents that discussed 5G in terms of 2018 and 2019?
A. When we were preparing the report, I mean, there -- there were a lot of documents so I suspect the answer is yes, but I do not recall precisely which ones.
Q. So how were you confident that these documents were representative of the position in 5G in 2018/2019?
A. I mean, well, I was reviewing the documents to try and identify suitable evidence to, you know, explore the validity or not of the case that is being put forward.
Q. You do not provide a list of the documents you looked at in your report, do you?
A. No.
Q. So we just do not know what you looked at and what you did not look at?
A. We do not have a definitive list, that is certainly

true.
Q. No, I would like to look at a few of the documents you cite and start with {POF/863}, please. This is an internal Qualcomm email. You do not have it in your hard copy because you referred to in your report.
A. Okay.
Q. So we assume you are familiar with it. Now, if we go to page 2, please, we can see it is an email from July 2018 {POF/863/2}. So this is well before Qualcomm made its first commercial shipments of 5G chips, is it not?
A. Yes.
Q. Because that happened in Q2-2019, did it not?
A. Yes, so it is about, what? About a year?
Q. Yes. I would like to look at the email that we see from Kim Spencer of Qualcomm and he is reporting on a conversation he has had with the Samsung procurement team and he is referring to the GS10 platform. Just pausing there. That GS10, that was going to be Samsung's first 5G smartphone, was it not?
A. Yes, the "S", I think, refers to -- sorry, the "G" refers to Galaxy, Galaxy Samsung.
THE CHAIR: Mr Bailey, is this document one of the documents in footnote 215?
MR BAILEY: Yes, Madam.
THE CHAIR: Which one is it?

MR BAILEY: If we go back, please, to --
THE CHAIR: Because there are four documents referenced. I just cannot --
MR BAILEY: Yes, Madam. Go back, please, to {ORI/21/67}, do you see --
THE CHAIR: That question is highlighted.
MR BAILEY: I am going to go to a few of those. It is on the bottom right-hand side.
THE CHAIR: Thank you.
MR BAILEY: Go back, please, to {POF/863/2}. I would just like to ask you to read a part of the email that you referred to. So it is {POF/863}. If we go to the page 3, please {POF/863/3}. We see at the top it stated:

"[Samsung] has to consider an option that [Samsung] LSI takes major share/volume of GS10... (0/1/2), even said 100% share of Exynos in the worst case, and then QCT takes GS10 5G volume only with 855 [that is a modem] + 5G mmWave unless QCT matches the 855 price close to [a figure] range (based on [a particular percentage]."

Now, this suggests, does it not, as of July 2018, Samsung was considering QCT losing a major share of chipsets used in its first 5G mobile phone? That is what this is suggesting?
A. Can I just check -- I have slightly lost the context

here. This is a Qualcomm internal exchange and "they", in that sentence, is Samsung?
Q. Correct. It is reporting, as I said, from a call that Qualcomm had with Samsung.
A. Yes. Sorry, could you just repeat the question?
Q. So there are two parts to this statement. The first is that Samsung is considering, is it not, Samsung LSI as a credible alternative for a major share of the chips that will be used in its first 5G mobile phone. Do you agree with that?
A. Yes, that is what it says.
Q. We see reference also to "5G mmWave" and I know you refer to that in your reports and I am going to come back to that, if I may. The other thing I wanted to just draw your attention to in this email that you cited, at point (4) we can see here a reference to a price gap between Qualcomm and Exynos. Do you see that, in point (4)?
A. Yes.
Q. Yes. Then we can see that the point (a):

"[Qualcomm] We expect to face more difficult position as [Samsung] LSI is more aggressively promoting Exynos [product] to gain more regional footprint if we don't react in time."

So, again, that is consistent, is it not, that

Samsung thought that at least in mid 2018 there was a genuine choice between Exynos and Qualcomm for 5G chips used in the Galaxy S10?
A. There certainly appears to be a choice, but I think the point that I would highlight is what I am saying in paragraph 3.84 is not that Exynos is not an option. The point that I was highlighting here is that there does appear to be a price premium potentially payable for the Qualcomm product and I see reference here to the $6-ish price gap, which --
Q. Yes. The point being that we also see Qualcomm respond by saying.

"If we do not react in time, then we are going to lose the socket, are we not?"

That is the point that Qualcomm is making in paragraph (a)?
A. Well, I certainly understand that to mean that they need to be careful about how big any such price gap would be.
Q. It is not saying that. It is just simply saying Samsung LSI is more aggressively promoting Exynos. If Qualcomm do not react, they are going to lose the business, are they not?
A. Yes, but reacting could be a $5 price gap or it could be a zero dollars price gap.
Q. I would like to look at another document you cite. This

is again in footnote 215, and it is at {POF/895/1}. We are moving forward in time now so we are now in February 2019. Go to page 3, please {POF/895/3}. Again, the context for your note is a conversation between QCT and Samsung procurement. For reasons of time, I would just like to look, please, at -- you see the heading, "5G Chipset Pricing"?
A. Yes.
Q. You will see that there is a complaint in paragraph (a) about the 5G chipset pricing?
A. Yes.
Q. Then do you see paragraph (d), the "sales recommendation", just at the bottom of the page?
A. Yes.
Q. The account team, that is the Qualcomm account team, is recommending to revive for 5G and then you see the size of the figure. That is a marketing development fund which is a type of pricing incentive. So this suggests, does it not, that we see Samsung complain about Qualcomm's 5G pricing, the premium point you mention, but we see that Qualcomm is having to respond, is it not, by having to offer price reductions in the form of a marketing development fund?
A. It certainly does appear that there is, you know, a potential offer on the table of a marketing

development fund, yes, correct.
Q. Can we have a look at one more document, please, and this is at {POF/910}. This is not one that you cite, but it was notified on the list. It is tab 78 of your hard-copy bundle. We are moving forward again in time. Page 2, please {POF/910/2}. This is 2 May 2019. This is a chain again of internal Qualcomm emails. I just want to show you what the position was on mmWave which we have seen earlier in the evidence. Can we go to page 4, please {POF/910/4}. You see halfway down, in bold --
A. Sorry, can I just check the timing, because I think Samsung launched its phone just before this, did it not? Was it April 2019?
Q. Yes. We are going to see that we are moving on to GS11 now. Just go to page 4 with me. So we see here:
"Samsung Exynos is very eager to win GS11 US/China/Japan regions while they believe that Exynos can do the mmWave on time."
So what we see -- and then it goes on, first bullet:
"Samsung Exynos expressed their strong confidence to meet Samsung Mobile's mmWave target KPI requirements... "
So, well, first of all, this suggests, does it not, that Samsung-Exynos is competing hard, including on

mmWave, for 5G chipsets using Samsung phones?
A. My understanding of this is that it is indicating that at the GS10, the Samsung-Exynos was not able to do mmWave effectively and this is then expressing confidence or Samsung has expressed confidence to Qualcomm that it anticipates for the next iteration of the phone, the GS11, it would have the ability to do mmWave.
Q. Yes. That was not my question. My question was specifically by reference to GS11. Have you looked at this document before?
A. I have certainly looked at it in -- when it was notified.
Q. Right. But have you looked at it in the course of preparing your reports?
A. I do not recall specifically.
Q. Can we look at page 7, please {POF/910/7}. This brings out the sales recommendation and various thoughts. We can see, just to talk you through it, at point 1, halfway down:
"If we standstill and no further price move of [Qualcomm modems], there is as a high risk that Samsung will bet all 5G volume ... on Exynos solution."
The second point:
"We can hold the pricing till the end until we see the Exynos failure of mmW but it is also the risk for us to bet all-in for that ... "
Then we see at point 3:
"Now, we should simplify the considerations and show our aggressive pricing move either we like it or not. Otherwise, it will be very difficult for us to maintain even NA/China/Japan and Samsung will minimise the share/volume close to 0 - 17%".
So that is saying, as at the date of these emails in May 2019, that Qualcomm is facing stiff competition from Exynos and it basically needs to respond with aggressive pricing, does it not?

A. Yes, it does indicate that at that point it is considering an aggressive pricing response, yes.
Q. I am grateful.
Moving on to Apple, if we may. I would like to take you back, if we go in a DeLorean back in time to 2012 and this is at tab 24 of your hard bundle and it is {POF/312}. This is an internal Qualcomm document. Page two, please, just to show you the document {POF/312/2}. It is a presentation made about Qualcomm account strategies from May 2012. Do you see that?
A. Yes.
Q. It is around the time of the negotiation of the BCPA. Have you looked at this document before?

A. Possibly. Again, I am not completely sure.
Q. You are not sure what documents you looked at for your reports, or not?
A. There were a lot of documents.
Q. Can we look at page 9, please {POF/312/9}. You will see it is headed, "Top Competitive Modem Threat at Mav". "Mav" is a codename for Apple. Do you see that?
A. Yes.
Q. If we just have a little look, we can start with -- let us start with Samsung LSI. Do you see that? If we go across, we can see green ticks under "competitive modem". "CDMA multimode" refers to collaboration with VIA again, does it not? So this shows that Qualcomm believed Samsung could meet all of Apple's chipset needs, including CDMA multi-mode functionality?
A. I -- well, I do not know whether it does show that because it -- I was not -- I was not sure how to interpret that specific statement about whether that means that by collaborating with VIA Samsung is then able to achieve a multi-mode solution or whether its solution to having a multi-mode handset is to collaborate with VIA potentially and have two separate chipsets.
Q. Whichever it is, it shows you that Qualcomm were competing with Samsung for the Apple socket, including

on CDMA. That was Qualcomm's perception at least, was it not?
A. Yes, although I think it matters somewhat which way round that is, because I think if you were talking about a "multi-chip solution", certainly my understanding of the facts is that that is usually an inferior solution to a single multi-mode chipset.
Q. Yes. We can also see here reference to Intel, both in the heading and then there is, again, ticks. Intel has a clean sweep of green ticks apart from CDMA multi-mode. That is right, is it not?
A. Yes.
Q. Yes. So in mid-2012 Qualcomm perceived Intel and Samsung as competitive modem threats for the Apple socket, did it not?
A. It certainly was evaluating the threat that they posed. I think it is a bit difficult to be completely clear about how threatening they are because the CDMA multi-mode is an important aspect of that and we see across for Intel and so despite them highlighting them as the top competitive threat, that is something that Intel do not appear to be able to offer.
Q. No, but we can see under the Intel strengths at Mav that it was competitive on LTE-UMTS, do we not, the third bullet down on the left-hand side?

A. Yes, yes.
Q. I would like to move forward in time, if we may, to look at the time period relevant for the negotiation of the GPLA, the Global Patent Licence Agreement between Apple and Qualcomm?
A. Yes.
Q. That was negotiated between mid 2018 and 2019; yes?
A. Yes.
Q. Again, I would like to start, if I may, with LTE-CDMA and just to see if we can join the dots. Can we go to {E/24/22}, please, the joint expert statement. Do you recall that you say here that Qualcomm held particularly significant market power for LTE-CDMA chipsets until Apple was able to source them from Intel? We looked at this earlier but I want to focus on Apple now. Three lines up from the bottom in parenthesis.
A. Yes, I see that.
Q. Yes. Do you recall that you have explained in your eighth report that Apple sourced LTE-CDMA from Intel from late 2017 onwards?
A. Yes.
Q. Yes. So to join the dots, you would accept, therefore, that Qualcomm either was declining in significant market power vis-à-vis Apple for LTE-CDMA chipsets from late 2017 onwards?

A. Yes.
Q. Insofar as Apple prospectively anticipated that it would be able to source LTE-CDMA from Intel, then applying the concept we discussed earlier of prospective market weakness, that would have applied even six months or 12 months before that; correct?
A. Yes.
Q. Yes. I would like to turn then to LTE-UMTS and can we go back, please, to the chart we were looking at earlier. This is the Class Representative's chart at {ORI/261.15}. This is a spreadsheet. Mr Noble, for your reference it is at table 5 -- tab 5. I do apologise. I want to focus now on Apple, if we may. Are you with me?
A. Yes.
Q. Yes. I am grateful.
So if we look at the percentage changes. I want to start in 2016. We will start with Qualcomm this time. We can see that in 2016 it was shipping 84% of LTE chips to Apple; yes?
A. Yes.
Q. That falls to 41% in 2018; yes?
A. Yes.
Q. The contrasting fortunes for Intel is that they were supplying 16% of LTE to Apple in 2016?

A. Yes.
Q. They go up to 50% -- 59%, even, in 2018; yes?
A. Yes.
Q. So would you agree with me that the shifts in share of supply to Apple are consistent with Apple exerting a greater degree of buyer power vis-à-vis Qualcomm between 2016 and 2018?
A. Yes, it is certainly consistent with some degree of buyer power being exerted because they are shifting a significant volume of chipsets.
Q. When Apple sources all of its LTE-UMTS chipsets from Intel for iPhones in 2018, that is a good signal, is it not, that Apple had a credible alternative to Qualcomm in 2018?
A. For UMTS?
Q. For LTE-UMTS, yes.
A. Yes, it is a good signal.
Q. The same point for 2019, when it sources all from Intel, LTE-UMTS, that is a good signal, is it not, that Apple had a credible alternative for that chipset in 2019?
A. Yes.
Q. Yes. I would like to turn then to 5G, please, and at this point, Madam, please could we sit in private and we need to use the strictest regime of 1782 external counsel only.

THE CHAIR: So we are now moving into inner ring closed session and I think that means some people will need to leave the room at this point.
(11.17 am)
In Private
(11.17 am)
MR WILLIAMS: Can I just say, Madam, I think we are actually two tiers above that ring in the very complicated system we have (inaudible).
THE CHAIR: All right.
MR BAILEY: For the avoidance of doubt, it is 1782 and it is external counsel only.
THE CHAIR: Okay.
MR BAILEY: Mr Noble, in your eighth report at {POE/21/63}, paragraph 3.74, you refer in the first line to:
"... as early as [2016] OEMs reasonably anticipated their future needs for 5G chipsets."
Do you see that?
A. Yes.
Q. You cite in footnote 199 a document. I would like to look at that, if we may. That is {POF/722/1}, please. This is an Apple document, internal document. We can see it sets out a plan in relation to Apple's 5G and you can see various dates and people referred to. I just want to pick it up actually underneath in 2020. It

says:
"This means that Intel will be our lead development partner for 5G and Qualcomm will likely stay in lockstep since they are technically capable, but there is a chance Intel will leapfrog Qualcomm."
Do you see that?
A. Yes.
Q. So this suggests, does it not, that in 2016 Apple envisaged that Intel would be its lead partner for 5G?
A. It certainly was expressing hope that that would be the case.
Q. Right. It says it in terms, does it not? It says:
"This means Intel will be our lead development partner for 5G."
A. Yes, it definitely says that.
Q. It does not suggest, does it, that Apple anticipated that it would be reliant upon Qualcomm for 5G chips in 2018 to 2020?
A. It does not —— it certainly sets out the fact that it anticipates that Intel will get there and Qualcomm will also get there, so ...
Q. Let us have a little look at some of what Apple anticipated closer to the time period relevant to the GPLA. At tab 70 of your hard—copy bundle, I want to move to 2018. This is {POF/864/1}. It is an internal

Apple cellular strategy document in July 2018. On page 1, we can see Apple was considering Intel, Samsung, Qualcomm and MediaTek for 5G sub—6 baseband sample chipsets. Do you see that on page 1?
A. Sorry, which tab?
Q. If you look —— tab 70.
A. Yes.
Q. You might find it easier on the screen because it is very small in the hard copy. What I am putting to you is that Apple was considering, in July 2018, for sub—6 5G chips, Intel, Samsung, Qualcomm and MediaTek; correct? Well, actually the relevant bit is above the diagram, sorry.
A. I mean, yes, this document appears to indicate that it is seeking samples from those four entities.
Q. Yes. For 5G sub—6 baseband chipsets; yes?
A. Yes, although I would anticipate that the extent to which it would regard them as suitable or alternatives will depend on once it gets those samples.
Q. I am not asking you about that for the moment. I am just trying to work out what Apple was considering in terms of sub—6 5G chips.
A. Yes.
Q. Can we look at page 2, please, to see the mmWave position {POF/864/2}. Here we see 5G mmWave baseband

sample dates. Here we also see Apple was considering Intel, Samsung, Qualcomm and MediaTek; correct?
A. It —— I mean, there are dots for Intel, Samsung and Qualcomm, but I do not see a dot for MediaTek.
Q. If you look on the left—hand side, you can see the players, Intel, Samsung, Qualcomm, MediaTek?
A. Yes, I see those.
Q. Yes. Certainly for Intel, Samsung and Qualcomm there are dates set out, are there not, for 5G mmWave for those first three suppliers?
A. Yes, but —— yes, there are.
Q. Could you look at the grey and the red diamonds. So if you look for Samsung, can you see there is a grey diamond at the end of Q4—2018 for Samsung? Do you see that?
A. Yes.
Q. Do you see that is earlier than the red diamond in Q2—2019 for Qualcomm?
A. Yes.
Q. Yes. So this says, does it not, that Apple was believing Samsung would have a platform commercially—ready 5G mmWave chip before Qualcomm?
A. Yes, this does appear to suggest that.
Q. If we go back a page, please, we can see it is the same story for the sub—6 as well. The grey diamond for

Samsung is at this moment in time, July 2018, Apple thinks Samsung will deliver a sub-6 5G chip before Qualcomm {POF/864/1}; yes?
A. Yes.
Q. I am grateful.
Now, I would like to move on, please to another Apple document, but we are going to move on in time as well. This is at {POF/934}. The date of this document is 12 March 2019.
A. Is this in the bundle?
Q. It is, sir, yes. It is at tab 80.
A. Thank you.
Q. Again, I apologise -- well, the hard copy may be quite small so you may find it easier to look at it on the screen. Just to navigate ourselves, March 2019, that is the month before the GPLA was signed is it not?
A. Yes.
Q. Yes. Now, there are various slides setting out various quotes in this document, but for ease can we look at page 11, please {POF/934/11}. We see here, for the iPhone in 2020, just pausing there, Apple launched its first 5G iPhone in 2020, did it not?
A. Yes.
Q. Yes. You will see in the grey columns and then next to that there is a white column, headed, "5G", you see

there is a reference to "Karoo"?
A. Yes.
Q. Take it from me that is Intel. You see next to it you have "Tanasi". Take it from me that is Samsung. Now, what we see here, do we not, is that Apple, as of March 2019, is considering quotes from Intel and Samsung for 5G and it included mmWave, did it not? You will see that halfway down, if you look.
A. Are these quotes?
Q. I am sorry, sir. My simple point is this: we can see a whole series of price quotes for 5G, low price and a high price, for each of Intel and Samsung, and I am just putting to you that this shows that Apple was considering Intel and Samsung for 5G, including mmWave, in March 2019.
A. Yes, although, I mean, the reason I was querying whether these are price quotes is because of the high and low range. If they were price quotes, I am not quite sure why you would have that range.
Q. Just to show you that Qualcomm was not out of the running, can we go back to page 7 {POF/934/7}, because we do not see Qualcomm mentioned here, but we can see on page 7, again Intel, Tanasi and Eureka. "Eureka" is the codename for Qualcomm, is it not?
A. That is my understanding, yes.

Q. So what this shows, does it not, is that regardless of whether it is a price or a cost, we can see that Apple is seriously considering -- these are quotes provided by Intel and Samsung for 5G, both sub-6 and mmWave, and Apple thinks it has, at the very least, two credible alternatives to Qualcomm in early 2019. That is right, is it not?
A. Well, I do not know if we can draw that conclusion. It certainly is comparing costs. I mean, there is mention here, I think, about quotes, but also estimates.
Q. Apple would not be considering cost quotes if it did not seriously think that Intel and Samsung would be capable of providing 5G chips, would it? It would not waste its time on hypotheticals?
A. I would be surprised if it would waste its time on hypotheticals, but this is a new technology and so it may well be seeking price quotes at the same time as it is evaluating the technical deliverability of any particular solution that is being quoted for.
Q. Can we agree therefore that as the overall assessment on the technical side, the cost and pricing side, Apple is considering Intel, Samsung and Qualcomm for 5G in March 2019?
A. Yes, it does appear to be seeking to explore all those options.

Q. I am grateful.
I would like to look at what Qualcomm believed and understood at the time. It is possible for my client to come back in at this point because I will move now to -- still in private, but no longer external eyes only.
THE CHAIR: What is this now?
MR BAILEY: This is 1782 but in-house counsel can see it.
I would like to start in April 2018 and this is a document at {POF/848/3}, please.
A. Is there a hard copy?
Q. Yes. It is tab 67.
Can you see -- you see it on the screen anyway -- there is a question being asked by Qualcomm:
"What do you think Maverick's [so Apple's] options really are for 5G and when do they really need to make a decision?"
The answer:
"I think they are intent on making Intel happen, as we all know."
So looking at it from Qualcomm's perspective, in April 2018, this suggests, does it not, that Qualcomm believed Apple was intent of getting 5G chips from Intel?
A. It certainly seems to indicate that Qualcomm believes that the intention of Maverick/Apple is to work with

Intel, if it can.
Q. If we just quickly look at page 7 {POF/848/7} and the final bullet, because we have already seen this particular entity already, we see that Qualcomm has picked up that they have heard Apple is trying to engage with Samsung LSI also for a modem. So that also suggests, does it not, that Qualcomm believe that Apple may be engaging with Samsung for a modem?
A. Yes, although it does use the word "tried".
Q. Well, we will come on now to look at a document that you cite that gives some further insight to this. Can we go, please, to {POF/853/1}. For your note, this is cited by you in footnote 125.
A. Mm-hmm.
Q. So this is therefore not in your hard copy. It is an internal Qualcomm email in May 2018. Go to page 2, please. We can see {POF/853/2} -- it is not in the bundle and it is just you cite this document in your report.
A. Yes.
Q. I wanted you to have that to hand. I would like to look at the document together which is on the screen.
We see we are in May 2018 now, so moving forward in time, and under, "Program Update", the third sentence, three lines down:

"Maverick is working exclusively with Intel for Mav 20 -- which is believed to be their first 5G platform."
That is consistent, is it not, that Qualcomm, as of May 2018, believed Apple was working exclusively with Intel for 5G chips?
A. That certainly seems to be the tone of that exchange.
Q. Yes. Therefore, it does not suggest, does it, that Qualcomm believed it would be the only show in town for 5G in relation to the Apple socket as at May 2018?
A. No, it does not suggest they think they are going to be the only show in town.
Q. It does not even suggest they are going to be in a strong position for 5G either, does it?
A. This is -- I mean, that specific paragraph certainly does not suggest that.
Q. Well, let us look at another email and see how Qualcomm's understanding changed throughout 2018 when you say 5G dominance arose.
Moving to July 2018. This is at {POF/862.1/1}. It is another Qualcomm internal email. The subject line is, "Mav update [so Apple update] 2019/2020". So we are looking ahead in time.
A. Is this in the hard copy?
Q. Yes, it is. It is in tab 69, if you would like to look at it in hard copy. Are you there, sir?

A. Yes.
Q. Can we just look together to see it is the third paragraph at the bottom of the first page:
"Mav [that is Apple] feels MediaTek is ahead of Intel ..."
You recall we saw MediaTek earlier today?
So:
"Mav feels MediaTek is ahead of Intel for 5G and appears to be aligning their internal resources accordingly. With that said, [Qualcomm] customer engineering and I do not believe that [Apple] is slowing down their 5G work with Intel and we believe they will continue forward... I do believe Intel's WiFi development for Mav has been cancelled."
Then the next paragraph:
"We are also hearing that [Apple] is definitely planning on us for some portion of their 5G requirements -- although no official signal yet. It will likely be us plus MediaTek, unless Intel can deliver flawlessly on 5G."
So that suggests, does it not, that in July 2018 Qualcomm anticipated that it would be one of Qualcomm and MediaTek, and possibly Intel, in terms of the supply of 5G chips to Apple?
A. I mean, that last sentence says "It will likely be us,

Qualcomm, plus MediaTek".
Q. Yes. "Unless Intel can deliver flawlessly on 5G", that is why I said "possibly Intel"?
A. Sorry, yes.
Q. Then if we look at page 2 of this document {POF/862.1/2}, we see a reference -- we see halfway down, the email begins from Mr Achour on July 5, 2018:
"Samsung could be an option given that they settled their differences. May be part of the settlement is for Apple to use the Samsung modem!"
So, again, that also suggests, does it not, that Qualcomm at least believes Samsung might be an option for Apple in 5G?
A. I mean, this email certainly raises that prospect.
Q. Yes.
I am going to move forward again in 2018, now to October 2018, and a document you cite, sir, in footnote 43 of your eighth report. The document is {POF/878/1}. It is a Qualcomm document and it is entitled "Apple Update". Are you there?
A. Yes.
Q. I am grateful.
I would like to go to page 15, which sets out some timelines for Apple phones {POF/878/15}. What we can see if we look at the row "Chipset", is how things are

changing. So 2017, it is all Intel, is it not, because Apple was -- can you see the chipset for 2017?
A. Sorry, you are looking at the first column?
Q. If you look at the first column under it says, "Phone Cycles", the second row "Chipset"?
A. Yes.
Q. Now go along with me, 2017, it is Intel, they are exclusively sourcing from Intel in 2017?
A. But is the 9X55 not a Qualcomm modem?
Q. Yes, you are quite right, sir. It is referring to Qualcomm and Intel together. You are quite right. I apologise.
If we move forward to the expectations as of 2019 -- sorry, 2020 for 5G, which is what we are focused on, you can see that they are anticipating one of three things that potentially could happen. The first is there is the Qualcomm chip for 5G, that is the first one there, is it not?
A. Yes, the SDX55.
Q. Yes. Or -- and/or we have an Intel 5G chip?
A. Yes, the XMM860 -- 8060, sorry.
Q. Yes. Just pausing there. This suggests, does it not, as of October 2018, that Qualcomm anticipated that either it may win the socket for 5G in 2020 or Intel may win it or they may be dual sourcing; yes?

A. Yes.
Q. So it does not suggest that Qualcomm would have necessarily a strong position in 5G looking at it at the time in late 2018?
A. Yes, although, I mean, it does cite -- it has a footnote by the Intel XMM8060 saying it is based on an Intel announcement so it is obviously -- well, appears to be based on public information as opposed to any --
Q. That is what you would expect, is it not, because Qualcomm and Intel are competitors?
A. Yes.
Q. So it is doing the best it can with the market intelligence it has?
A. Yes.
Q. Yes. The final document from me. We are now in December so it is Christmas time 2018, a few months before GPLA. Can we look at {POF/882}, please. This is tab 72 in your hard copy bundle. This is a QCT strategic plan if we go to page 2.
A. Yes.
Q. Have you seen this document before?
A. I certainly reviewed it before today.
Q. Yes. For the purposes of today or --
A. Yes.
Q. -- for the purposes of your reports?

A. Again, I am not sure with sufficient certainty to say either way before the report.
Q. I am grateful. Just look at one slide at page 18 {POF/882/18} recalling in December 2018 Qualcomm is looking at what the position is going to be for Apple. Do you have that?
A. Yes.
Q. I am grateful. If we look, please, under the heading on the right-hand side "Apple revenues decreasing", do you see that?
A. Yes.
Q. You see the second bullet:
"Planning 5G with 0% Apple share, any design wins are accretive to plan."
A. Yes.
Q. So that does not suggest, does it, that Qualcomm anticipated, at the end of 2018, that it would be occupying a strong position as a supplier of 5G chips to Apple?
A. It certainly appears to suggest that the baseline planning assumption that they are using is that they do not win Apple.
Q. Yes. Therefore it is not anticipating that it would have a "strong position" in the words of paragraph 3.89 of your eighth report in 5G?

A. Well, it -- that is certainly the baseline planning assumption in this slide, yes.
Q. The baseline planning assumption therefore does not support your view that Qualcomm had dominance in 2018 for 5G, does it?
A. I mean, this certainly suggests that there is an alternative world that could have -- that Qualcomm is considering, where it does not win that and therefore it, you know, if it gets -- if it gets the slots, that is a positive story in addition to the baseline plan.
Q. That is the positive way of looking at it, but the realistic way of looking at it is they were expecting to get 0% Apple share. That is what they are saying. They are planning 5G with 0% Apple share, are they not?
A. I mean, this -- you can read it that way.
MR BAILEY: I am grateful. Madam, that concludes my questions. Mr Jowell will have some questions now.
THE CHAIR: All right. Is now a good time for a five-minute break, given that we are changing counsel?
MR JOWELL: Yes, I think so.
THE CHAIR: All right. Thank you.
(11.40 am)
(Short Break)
(11.51 am)
Cross-examination by MR JOWELL

MR JOWELL: Mr Noble, could we go, please, to {E/24/32} of the joint expert statement, at paragraph 63.1. You refer here to proposition 51 that is agreed and you state that:

"... the reliability and representativeness of my bargaining model can be tested by verifying the consistency of the assumptions and predictions against the available evidence (and so the model itself can be falsified)."

Do you see that?

A. Yes.

Q. Now, I think you accept that the only potential available evidence for the Tribunal to actually carry out that verification or falsification exercise is in —— comes in two forms or two potential forms. One is the factual evidence, so the documentary and witness evidence, and the other is the leveraging analysis. That is broadly correct? There is no other way?

A. No, I think there are other sources, for example the market shares, you know, the other transaction data, for example. That is certainly —— would feed in to any verification exercise.

Q. Right. But that is within the documentary and witness evidence?

A. Yes, so if you cast documents as being broad, then, yes,

I would agree with that.

Q. Okay. You take the position, and if time permits, Mr Saunders may explore this with you a little, that the leveraging analysis does not assist one way or the other in verifying or falsifying your hypothesis; correct?

A. Yes, that is correct.

Q. That is your position?

A. Yes.

Q. I think, as the Tribunal has already established, therefore, we are left with the factual and documentary —— the documentary evidence effectively and the witness evidence in the broad sense that you just identified?

A. Yes.

Q. Now, in your reports you refer to various documents and bits of hearsay. I think you suggest that they prima facie support your bargaining model and its underlying assumptions and predictions; yes?

A. Yes.

Q. I just want to understand how you came to select the documents that you mention in your expert report, because I take it that you were not able personally to go through all of the documents disclosed in this case? You must have been provided with a selection of the documents?

A. I, together with my team, went through a long list of documents.

Q. That long list was provided by those instructing you?

A. I think we were provided with documents. I do not know whether we were provided with every single document in this case, but we certainly had a long list.

Q. But you would agree that the documents and evidence that you have seen are only part of the total available evidence to the Tribunal?

A. I would —— yes, I would —— I think that is right.

Q. You would accept, I think, that you have not carried out in your reports a comprehensive and complete survey of the available documents and I think you acknowledge that fact-finding is therefore a task for the Tribunal?

A. Yes, and yes, to both halves of that question.

Q. Yes. Now, I think you confirmed to the Tribunal last week that your preferred counterfactual is that found in your eighth report at paragraph 6.65 where you state that an OEM would be able to sign a licence specifying that, absent an agreement over royalties, the appropriate rate would be subject to a third-party determination of the appropriate royalty rate as part of a broader agreement to supply Qualcomm chipsets; yes?

A. Well, I clarified in the hot-tub that the counterfactual, in a sense, at its heart is the no

linking, the no conditioning idea, that the licensing negotiation is unaffected by chipset supply, and one way to achieve that is what I describe in 6.65.

Q. Well, I think it is the only way, is it not, that one can imagine, unless —— without banging into the problem of exhaustion, is it not?

A. I do not know. Ultimately whether the problem of exhaustion is a problem I think is not for me to answer.

Q. Assuming it is a problem, then the only viable option is your open licence solution?

A. I outlined that as a solution to that. I do not know whether there are solutions. There could well be other solutions. I think the footnote to that paragraph also identified another possibility, which is that you might charge a fixed-fee licence alongside a chipset, as another solution.

Q. But I think that is not being pursued, that proposal, at least by you?

THE CHAIR: Mr Jowell, Mr Noble clarified, helpfully, that his counterfactual was essentially that articulated by Mr Moser in his opening submissions.

MR JOWELL: Which I understood to be the open licence, as I ——

THE CHAIR: Well, no, Mr Moser did not say that. Mr Moser said that the counterfactual was a world in which there

was no conditioning, which is what Mr Noble has just said.
MR JOWELL: Yes. But one way -- in any event, let me take this is a little further.
So you do accept that in a world in which there was a licence of the type that you describe, let us call it an open licence, at a rate to be determined by, say, an arbitration panel, you would accept that that is your counterfactual or that is an acceptable counterfactual in which --
A. I certainly I agree that it is, yes, it is workable -- it appears to be a workable version of the counterfactual, the non-conditioning.
Q. Could I show you some documents that I think you do not refer to in your report, but I think are in the bundle before you.
A. Yes.
Q. If we go to {POF/684}, please, at tab 54. This is a letter of 15 July 2016.
A. Yes.
Q. You see what it says in the bottom paragraph.
A. On the first page?
Q. Yes. (Pause)
We should see the next page as well so you can see the complete paragraph {POF/684/2}. (Pause)

A. Yes.
Q. Let me show you another letter. This one is {POF/751}, which is tab 59 of your bundle. If we go to page 5 {POF/751/5}. Again, if you see the main paragraph. (Pause)
A. 59?
Q. Yes.
A. Which page, sorry?
Q. Page 5.
A. The large paragraph at the bottom?
Q. The one starting, "In the meantime ..." (Pause)
A. Yes.
Q. If we go next to tab 63, please, of your bundle {POF/790}.
THE CHAIR: Do you want to ask a question before we move on to the document?
MR JOWELL: Well, I want to show him all three documents just for convenience, otherwise it will ...
This one now is dated August 31, 2017.
A. Yes.
Q. You see the third sentence:
"Qualcomm also remains willing to submit the parties' dispute to binding arbitration ..."
And so on.
A. Yes.

Q. My question is: were you aware of these three specific letters before providing your expert report?
A. I do not think I was.
Q. No. But it does appear, now, does it not, that Apple had access to precisely the sort of open-licence arrangement that you envisage?
A. Well, I do not know whether this is quite what we envisaged because my recollection of looking at the -- because there are other exchanges. There are responses from Apple. My recollection of those is that they raise question marks about the approach to be adopted in the arbitration and the scope of the arbitration. I think there was a dispute about whether it was SEPs only or whether it was SEPs plus other patents, and so -- and in fact I think, if I recall, Apple itself proposed a slightly different form of arbitration and so it certainly appeared as though both parties were willing to contemplate the concept of arbitration, but the dispute appeared to be quite how it was going to work and what was going to be included.
Q. Well, if you go to -- it certainly -- it certainly seems that the terms of the arbitration that Qualcomm are prepared to agree to are in the most open terms possible. It does not restrict the arbitrators from a particular valuation methodology or the arguments

available to either party, does it?
THE CHAIR: Mr Jowell, I am not sure we need to hear from Mr Noble on this. Mr Noble has rightly accepted that he has not carried out a complete survey of the available documents and that fact-finding is a task for the Tribunal. We would actually like to hear from Mr Noble on the economic stuff, which Mr Saunders is going to get to.
MR JOWELL: Yes. Very well.
My point is simply that if the Tribunal does agree that this is an open licence of the type that you envisage, then you would accept that the actual and the counterfactual are the same?
A. No, I would not.
Q. Well, how is that possible?
A. Because the counterfactual envisages that they would not -- that Qualcomm would not just do this for Apple. It would do it for everybody. So because as well as the concerns about can Apple directly access an arbitration or this open licence concept, there is also the question mark about could everybody else and then that feeds back to the second indirect mechanism that we talked about in the hot-tub whereby the -- some of the input into these kinds of dispute resolutions mechanisms --
THE CHAIR: The tainting mechanism?

A. Precisely. That ultimately -- if these open licences with arbitration clauses had been offered across the board, then that kind of concern would dissipate.
MR JOWELL: So this is your fruits of the poisoned tree argument, is it?
A. Well, it is BJ Watrous I think that the fruit was poisoned.
Q. But that is a very indirect mechanism, is it not?
A. Well, it is an indirect mechanism, yes.
Q. Now, I think let me turn to something else. The essence of your bargaining model, as I think you explained to the Tribunal last week, is an assumption that in the actual world there is an explicit or implicit threat of an outside option of cessation of chipset supply which you say would occur in the event of a FRAND challenge and so disable or deter that FRAND challenge; correct? That is broadly your thesis?
A. Yes, that is the direct mechanism.
Q. Yes. Now, can we just consider an OEM that simply does not buy any chipsets at all from Qualcomm and has no intention of buying chipsets from Qualcomm. Now, I think you would accept that the outside option does not apply in that case because it only matters if there is actual or prospective chipset supply to the OEM in question; correct?

A. Well, the direct mechanism would not apply, but we are back to the indirect mechanism.
Q. Okay. Subject to the indirect -- I think we can take it that subject to the indirect mechanism, there is then -- it could not then be affected by any abuse?
A. Well, it cannot be affected by the direct mechanism, but it could be affected by the indirect mechanism.
Q. Okay. If you do have a rate that is established by one OEM but does not have chipset dependency and then you have another licensee that has a most favoured royalty clause in its contract, so that I can obtain the benefit of that other royalty rate and apply it to reduce its own royalty rate, then you would accept, subject to your indirect mechanism, that that other royalty rate also cannot be affected by the alleged abuse; correct?
A. Sorry, I am -- it is a long question. I am not sure I fully followed. So the --
Q. I think you accepted if you have a chipset -- if you have other chipsets -- if you have an OEM that is negotiating a royalty rate with Qualcomm and it does not buy any chipsets and it does not plan to in the immediate future, then I think you accepted that, subject to your indirect mechanism, then the abuse cannot -- your theory of abuse cannot operate?
A. Yes. So the mechanism that that entity could be affected is the indirect mechanism.
Q. The only mechanism -- the only way is the indirect mechanism?
A. Yes.
Q. Okay. Again, if you have another OEM that has a most favoured royalty rate in its contract with Qualcomm so that it can take the benefit of the former OEM's royalty rate, then, again, subject to your indirect mechanism, it too -- its royalty rate also cannot be affected?
A. Yes, as -- but, again, subject to the indirect mechanism.
Q. Yes.
A. Because that in a sense the source of that --
THE CHAIR: Yes, I understand.
A. Yes, yes.
MR JOWELL: Now, can I come to another assumption of your model, one that I clarified with you at the end of the session on Thursday, and that is -- perhaps if we go to the joint statement {E/24/35}. We see, at the bottom of the page, 67:
"When a given conduct [for example the decision not to supply chipsets] changes the outside options of both parties in the SEP licence negotiation, whether the impact of that conduct on the negotiated outcome is influenced by the relative effect of the conduct on

those outside options."
You say "yes". Do you recall that?
Now, we discussed yesterday that one of the assumptions of the bargaining model is that in order for there to be a credible threat of cessation of supply, you say the relative cost to Qualcomm of foregoing chipset sales has to be less than the relative cost to the OEM of disruption of handset sales; yes?
A. Yes.
Q. You clarified in response to my question at the end of the session last week that when you say "relatively not harmed", at least in the model, that is to be measured in absolute amounts, not relative to the profits made by the two respective businesses; yes?
A. Yes. So the "relative" in this is relative to each other negotiation as opposed to relative to the overall scale.
Q. Yes. So I just want to question whether that is the correct approach, even in theory. So let me give you an example. Suppose of a game theoretic situation, a simple one on a road. So let us suppose there are two cars, one of them is a Volvo and one of them is a Rolls-Royce and let us say there is a Mexican stand-off as to who is to reverse backward and the outside option is that neither does and the two cars

scrape each other.
Now, one might say, well, if there is a scrape, it is going to cost the Rolls-Royce owner rather more to repair than the owner of the Volvo or the Ford; yes?
A. Yes.
Q. Right. Now, but if -- now let us change the scenario and let us suppose that owner of Rolls-Royce is the Sultan of Brunei and he has 50 Rolls-Royces in his garage and, conversely, let us suppose that the owner of the Volvo is on the verge of bankruptcy so that the cost to him of the repairs would be catastrophic.
Now, that rather changes the likely outcome, does it not?
A. But you have changed the outside options because the Sultan of Brunei's outside option is to scratch the car at then just get in another one, is it not?
Q. Well, it is not; it is simply that he is the Sultan of Brunei so he does not have to worry about money very much because he has lots of it.
A. I mean --
Q. He still has to repair that Rolls-Royce. It is just it is going to matter much less to him.
A. Well, I mean, I guess the thing I struggle with with that is that we are talking about sort of personal utility , which is a bit different from the example we

are talking about here where we are talking about two businesses that are trying to negotiate an agreement.
Q. Well, does it matter? Let me give you another example. Suppose you have a farmer selling to a supermarket and you say, well, if the farmer loses a million and the supermarket -- let us say the farmer is supplying the product and there is a possibility of cessation of supply, just as in our case, and the farmer loses 1 million and the supermarket loses half a million and then the scenario flips and the supermarket loses the million and the farmer loses half a million. You would say, well, the advantage in the negotiation lies with the farmer, but, again, let us suppose that the half a million means that the farmer goes out of business.
THE CHAIR: I am not sure that these analogies from different situations are really helpful. I mean, maybe you just want to put the specific question about these circumstances to Mr Noble.
MR JOWELL: Well, I think -- with respect, ma'am, let me go down the line with the witness because I think it is an important theoretical point which can be illustrated by these examples, I think, and I am interested in Mr Noble's reaction, because it does seem to me that, even in general terms, it is almost always going to matter what the relative effect is on the businesses

concerned.
A. Well, but I think in both the car example and this one we are talking about an outcome that is truly catastrophic for the individual on one side of the negotiation and I think that is a bit different from the situation that we are talking about here because it -- from my review of the facts, this does not appear to have been catastrophic in terms of -- I do not think it is countenanced that either Qualcomm, or Apple, under these outside options, even if Qualcomm -- sorry, if Apple could not sell CDMA phones, it would cost it, you know, very, very roughly something like 9 billion of profit that it might lose, say, and Qualcomm potentially loses, you know, royalties and/or, you know, chipset revenues from that, but I do not think either of those entities in those scenarios would be countenancing going out of business; it is just that they lose a lot of money.
Q. Well, let me ask you about some more of the assumptions there, because you pose a scenario in which Qualcomm, as an outside option, is prepared to completely cease supply of CDMA chipsets to Apple, but obviously Qualcomm is also engaged in repeated interactions with Apple, is it not, and with Samsung?
A. Yes.

Q. So it has to take into account not just what is the effect going to be on us of losing the CDMA sales immediately, but also the long-term effect on the relationship with Apple and Samsung; correct?
A. Yes, it would need to factor that in.
Q. If Qualcomm was to cut off Apple's chipset supply and disrupt their business, there must be quite a high probability that Apple would never choose to do business with Qualcomm ever again in the future; correct?
A. Well, Apple might adopt a kind of retribution strategy like that, but certainly my experience in large corporate businesses is that they may -- they may ultimately come back to the table and take the view that, you know, if you have a really good product, we will deal with you again.
Q. But that is a very large risk to take with your largest customers, is it not?
A. It certainly -- yes, if you anticipate the counterparty in your negotiation might behave like that, then it would increase the risks. I would agree with that.
Q. Yes. Equally, if you were going to shut off the supply, say, of CDMA chipsets, then you would have to take into account that if you were selling other types of chipsets, say UMTS chipsets, where on your theory they do not have market power, 3G UMTS chipsets, then you

would have to take into account that Apple or Samsung would then choose to go elsewhere for those chipsets; correct?
A. For 3G UMTS?
Q. Yes.
A. Yes, you would need to factor that in.
Q. That possibility in. Of course you would also have to factor in the possibility that Apple and Samsung, if you disrupted their handset business, might feel that it is important to set —— give a signal to the wider market, so it might make sense to make an example of Qualcomm in that scenario?
A. So this is Apple or Samsung wanting to discipline Qualcomm publicly so that other ——
Q. Yes.
A. —— other providers of licences ——
Q. Do not disrupt them either, yes. That must be a possibility?
A. It would be a possibility if they felt that that was an important signal to send.
Q. So whether you are taking —— whether you are calculating the absolute amounts, as you prefer, or the relative amounts, as I suggest is also relevant, it is actually quite a complex exercise, is it not?
A. Yes, there —— in any negotiation, there are lots of

factors and I would certainly accept that the bargaining model here does not try and capture every conceivable factor. As with any economic model, it tries to zoom out. A bit like a map, it is trying to distil the essence, what are the most important factors, and model those explicitly.
Q. You have only done it in the abstract. You have not actually attempted any quantification in your report, have you?
A. No, I think, as we talked about in the hot—tub, we do not have explicit quantification, in part because there are many negotiations, there are many years and of course there is the point that we also discussed which is that there are the negotiations that were contemplated and never happened. So you would have to do this again and again and again so it would be a hard exercise to calibrate the model for every year, for example, precisely with maths.
Q. Now, if we think about the different —— the extent of disruption to the OEM, that will depend also upon whether it has contractual assurances of continuity of supply from Qualcomm in relation to chipsets for existing models of phone, will it not?
A. Yes, and I think, as we talked about earlier, there is the existing phones and there is the future phones and

if you have cast—iron commitments for delivery of chipsets for existing phones, then obviously you will be much less worried about that. There is a question of how cast—iron those are, but, you know, assuming they are cast—iron, then you will be not very worried about that.
Q. Your model does not specifically take into account the possibility of those assurances of supply, does it?
A. No, it does not, but in a sense the way the model is set up, it does not explicitly model those two separately. What it is looking at is the amalgam of is access to Qualcomm chipsets something that will either allow you to earn more profit on units that you sell or will it mean that you can sell more units because perhaps, you know, for example with CDMA, and so it essentially merges those two mechanisms together.
Q. Can we turn to look at a bit of the evidence, and there will not be time to look at much of it, but let us look at something about the importance of Apple to Qualcomm in around the time of the BCPA in 2012. If we could go, please, to {POF/312}, which is tab 24. If we could go, please, to page 7 {POF/312/7}. This is a Qualcomm presentation, dated 25 May 2012.
A. This is the account strategy one?
Q. Yes. We see here "Maverick Importance to QCT",

"Maverick" of course is Apple. We see:
"Securing 100% share of Maverick through 2016 represents $9B of 'additional profits'."
"Maverick accounts for 57% of FY/13 QCT."
"Socket loss at Maverick represents a fundamental budget risk ... would require resizing QCT organisation."
Now, had you seen this document before you prepared your expert report?
A. I am not sure about this one.
Q. Now, if we go to —— if we can go to Dr Padilla's report. It is at {ORE/22/29}, please. If we focus in on figure 2, the red line is Apple's share of Qualcomm's chipset sale volumes. We see that in 2012, it is around close to 25%?
A. Yes.
Q. So I would suggest to you that the effect on Qualcomm's chipset business of losing Apple as a chipset customer in2012/2013 would have been pretty disastrous, would it not, based on the two documents we have just seen?
A. On the chipset business?
Q. Yes.
A. Well, it would appear to —— if it lost all of it, it would represent 25% of the sales they would directly lose. There is then a question mark about the

recapture, which is something that my model tries to capture, the notion that if they lost those 25% to Apple, they may recapture them via other OEMs.
Q. Well, we saw there -- you saw the internal document. They certainly did not seem to think they were just going to recapture that volume if they lost the chipset sockets to Apple, did they? They thought they would have to downsize the whole organisation.
A. Yes, but that is not necessarily inconsistent with recapturing a portion of the volumes. My model does not assume that they would recapture all of them. Imagine -- well, it assumes that they would recapture some of them and that is consistent if you have 25% of your sales with one customer and you recapture half of them, then potentially you get, what, 12.5% back. So that may -- that is still 12.5% reduction in the size of your sales and so that may well require a resizing of the business.
Q. Okay. So you think that they might still recapture some because that is what you're theorising?
A. Yes, the model assumes that Qualcomm would have the ability or the expectation of recapturing some of those volumes via, you know, sales to other OEMs, if it did not sell those to Apple or Samsung or any other OEM.
Q. Right. Can I just explore with you a little bit how

realistic that is in the real world, because in the real world, Apple phones sell on the basis of multiple dimensions; right? It is not just the chipset inside, it is also the camera, the battery life and so on; right?
A. Yes.
Q. So are you really suggesting that somehow Lenovo is going to come in and just because Apple are not selling phones with Qualcomm chipsets inside, Lenovo are going to come in and take up all that Apple sales volume to customers?
A. Well, to me the clearest example of this is where Apple was contemplating whether or not to have CDMA-enabled chipsets because there was a whole -- there were two large US networks where you could not use an Apple iPhone and it wanted to continue growing the sales space in the US and so it had a strong incentive to acquire CDMA chipsets and I infer from that and have seen in the documents that they essentially saw that as a gateway to additional market share. The inference of that is that if Apple had not bought those chipsets, then other -- you know, the consumers on those networks, like Verizon, would have been buying other phones. Maybe they would have bought an Android phone. Maybe that would have been a Samsung phone. Maybe it would have been a Lenovo

phone or a different phone, but the assumption in the model is that at least some of those chipsets that in the factual were in fact sold to Apple would have, in the counterfactual where they had not agreed that with them, been sold to other OEMs that were selling, for example, on Verizon, because that is the network that the customer wished to be on.
Q. I see, but we see from the internal document of Qualcomm that they perceived it as being a fundamental budget risk of losing the Maverick socket. How do you square that with your thesis?
A. Well, I think both things can be true. It can be -- the model does not assume that it is costless for Qualcomm to do this. What it is assuming --
Q. Just pausing there. So you do accept that it would be extremely costly to Qualcomm to do this?
A. I accept that essentially declining to supply a customer would almost, by definition, be costly to you in the immediate sense, but the question is can you then mitigate that cost to some degree by recapturing those sales to somebody else?
Q. Well, I suggest to you that the available evidence to us suggests that that mitigation would be quite small.
A. Well, my judgment overall, having seen lots of evidence, is that it -- I doubt the recapture rate is 100%.

I also doubt that it is zero. It is somewhere in between the two. The question is precisely where, particularly when we are talking about CDMA. I would anticipate that recapture rate is quite high, because, as I explained in the hot-tub, one of the processes that you may expect to have happened prior to Apple launching a CDMA-enabled iPhone is that those customers that really wanted an iPhone that were on a CDMA-enabled network would have switched by that point to a UMTS-enabled network to get an iPhone and, therefore, the customers that are left are those that are less willing to switch and therefore by gaining access to a CDMA-enabled iPhone or, rather, being able to sell a CDMA-enabled iPhone, Apple is then essentially opening up a new group of customers that it otherwise would not be able to access.
So because of that it is -- I would not say those customers are necessarily completely captive, but they have demonstrated a preference for a CDMA-enabled network, for whatever reason, and therefore I think that is consistent with the idea that this recapture rate would not be low. It would be --
Q. You have not done anything to test whether it is -- what the rate would be? You have done no quantitative or empirical analysis so it is just impressionistic;

correct?
A. It is a judgment I have made based on the documents and the evidence that I have seen.
Q. We will have to agree to disagree about what the impression the documents give.
Let me turn to Samsung. If we look at {ORE/22/29} ––
A. Tab 29?
Q. Yes. We are going back to –– it is on the screen. It is the –– again, we see the ––
A. Sorry, this is the ––
Q. This is figure 2 again.
A. Yes, sorry. I have this.
Q. Again, if we look in the –– I am just going to focus in on the 2008 to 2009 period when Qualcomm is negotiating the 2009 amendment with Samsung. We see that, at that time, around 2009, Samsung's share of Qualcomm's sales reaches its peak at a little over 30%, almost a third; yes? That is the blue line.
A. Yes. Yes, in volume terms, yes.
Q. Yes. Now, putting a third of your chipset sales at risk, again, would be a huge financial risk for Qualcomm, would it not?
A. So you are envisaging here that Qualcomm would cut off all supplies to Samsung in that scenario?

Q. Actually I think one can –– it does not matter, does it, because I think we discussed earlier that you accepted that if they were to cut off CDMA supply, then they might find that Samsung decided that they would not want to buy UMTS chipsets; correct? I think you conceded that earlier.
A. Yes, it might be the case that Samsung might seek to substitute to the extent that it could from one chipset to the other on UMTS.
Q. Yes. So, therefore, if it was to do something to disrupt Samsung's sales, even if it is just of CDMA, it is putting at risk 33% of its sales?
A. It could be, but I think we have to ask ourselves: why is it that Samsung, who is somebody that buys from multiple buyers when it can and also I think can it self-supply by this point or is that by 2010?
Q. It is a little later.
A. Yes. So it cannot self-supply at this point. So as an economist, when I look at these numbers, the inference that I often draw is, and particularly in this case, Samsung is choosing to buy these chipsets because it thinks that they are the best price/value mixture for that particular option and so it potentially could, either then or at some other point, in response to, say, CDMA being withheld, it could try and almost

reverse leverage, as I think we called it before, by threatening or actually not buying the UMTS chipsets, but that in itself is potentially costly to it, because it potentially has to choose the second best supplier of UMTS, rather than the first best supplier.
Q. Let us look at the breakdown. Let us go to {ORE/22/57}. I know this is Padilla figure 4 which I know –– it should be on the screen, if you want look at it.
A. Yes.
Q. We can see Samsung's chipsets purchases by the different cellular standards; yes? If you look at 2008/2009, you can see that there is a chunk there of 3G UMTS; yes?
A. Yes.
Q. Now, Samsung –– you do not allege that Qualcomm has dominance in that?
A. No, no.
Q. No. That is about 20%-odd. Then 2G GSM, again, you do not suggest that Qualcomm has dominance in that?
A. No.
Q. Then we just have 10% or 15% is 3G CDMA.
A. Which year are we in?
Q. 2008/2009.
A. 2008?
Q. Yes. Maybe 15% to 20% at most, I think, 3G CDMA?
A. Yes, 15 to 20. I would agree with that.

Q. Yes. So I mean, first of all, it is a relatively small proportion of Samsung's purchases where you are alleging dominance, but there is a huge ability there for Samsung to come back and discipline Qualcomm by switching to alternative suppliers for 2G GSM or 3G UMTS; correct?
A. I mean, theoretically, that might be a possibility, but, as I said, one has to think carefully about the fact that Samsung exercising such an option is not necessarily costless, because of their potentially having to move to a second best supplier in terms of price/value.
Q. But is it –– it is not really a credible threat, is it, from Qualcomm to threaten to cut off its largest customer at this point in time, when it is so dependent on it, selling 33% of its chipset sales to it?
A. Well, I think potentially it is a credible threat because the ––
Q. Come on, Mr Noble, it is not a credible threat, is it?
A. Well, why would it not be a credible threat?
Q. Because the harm to Qualcomm is catastrophic. You accepted that –– you said when I gave you the examples, my examples about the car and the farmer, you said "ah, but those are catastrophic examples." This would be a catastrophic example for Qualcomm?
A. Well, arguably we have an example of what we might call

this catastrophic event, which is when Apple stops buying chipsets from them and Apple stops paying royalties to them. Whether it was legitimate or not to do that, let us put that to one side, but it did in fact do those things. What we see is that Qualcomm did not, you know -- it did not --
Q. Dare to cut off chipset supply.
A. It did not enter bankruptcy. It was not in those extreme scenarios that I was talking about where -- because in those hypothetical examples you gave those are catastrophic examples where the future of the business was imperiled. What we see in there is that Qualcomm did not -- the future of Qualcomm's business does not appear to have been imperiled and its judgment appears -- in the aggregate, appears to have been that it would carry on. It would continue to trade.
Q. Well, I think -- I do not know if you were here for Mr Rogers' evidence, but he mentioned that at that time they received a hostile takeover from Broadcom that would have completely gutted their whole business model, if it had been allowed to go through.
A. But, in a sense -- to my eyes as an economist, that is a different issue. That is really the market for corporate control becoming active and, you know, whether that was precipitated by the dispute with Apple or

whether it would have happened anyway, that is hard to know, but, you know, hostile takeovers happen and in a sense what would Broadcom have been buying? It would have been buying the business of Qualcomm. It would have been buying a dispute with Apple at the same time and so I guess for me there are somewhat separable points.
Q. Well, let us consider that time in -- that point of time in 2018, because when Qualcomm is in -- let us just put it in a neutral way -- serious difficulties; yes?
A. Sorry, when?
Q. Is in serious difficulties . Do you agree that in 2018, when Qualcomm is in such serious difficulties with Apple, it is -- at that point at least, can we agree that it is completely implausible that it would have cut off chipset supply to Samsung as well?
A. I mean, that is -- in 2018 to have cut off chipset supply to Samsung as well, well, I mean, I do not think it is completely implausible, no. I mean, what we have seen is that in the Apple/Qualcomm dispute there were a variety of opportunities where both parties could have reached a mutually acceptable agreement. For whatever reason, they do not reach that and they end up in litigation and, yes, to my mind, the information or value of that is that there is then a dispute between

these two entities.
Q. Well, let us look at one document {POF/878}. You refer to this in your report. If we go to page 11 {POF/878/11}, this is an internal Qualcomm presentation from 8 October 2018. If we could go, please, to page 11. We see here they are modelling various hypothetical scenarios. You can see that Apple and Huawei are split off and the reason for that is because at this stage neither Apple, nor Huawei are paying royalties; yes?
A. Yes.
Q. You can see that Samsung represents close to $1 billion in revenue, which is at this stage a third of the revenue they are getting in, $3.4 billion?
A. Yes.
Q. So you are seriously telling the Tribunal that, in the midst of this dispute with Apple and Huawei, it is plausible that Qualcomm are going to cut off -- risk cutting off the supply of their single largest remaining customer that is still paying royalties?
A. So which type of chipset are you imagining this example that Qualcomm might cut off?
Q. Well, you tell me. Which one were they dominant in in your view at this stage in 2018?
A. In when?

Q. 2018. Because I think Mr Bailey rather established that they were not dominant in any chipset -- particular generation of chipset at this stage in 2018?
A. Well, ultimately if Qualcomm felt confident that it had a very strong position in those chipsets, what I am positing in my analysis is the extent to which it could then credibly threaten somebody to not supply those chipsets and the -- I mean, I am not sure there is a lot of evidence in here, but what you do not see at this time is that, despite the fact that Apple and Huawei are not paying at that time -- are not actually paying royalties, you do not see that the share price of Qualcomm crashes. Rather, yes, it fluctuates at various times, but share prices fluctuate and it is not the case that you would expect because you are not receiving revenues right now that jeopardises the future of your business.
Ultimately what your share price is based on is the future expectations of your investors of what revenues you are going to earn and ultimately the judgment -- the trade-off in the model is that Qualcomm is willing to essentially trade revenue on -- and profitability on the chipsets in order to maintain the revenue and profitability on its licensing.
Q. Let us look at the share price because it is in this

same presentation, page 2 {POF/878/2}. You see the share price at 1 and one sees -- you see the label 1 is that is when Apple and the FTC launch their litigation --
A. Yes.
Q. -- and cease paying royalties. You see that the share price plunges quite significantly and then continues to go down right until November 2017 and then you have the spike because of the Broadcom hostile bid.
A. Yes.
Q. So -- then it crashes again.
A. Well, I mean, it is difficult to interpret, you know, a share price chart like this without seeing a benchmark against which to evaluate, because in any share price there are, you know, firm-specific movements but also general market movements. So, you know, it would be much easier to analyse this chart if we saw, for example, the S&P 500 so that we can compare that, because one wants to know the extent to which some of these movements are firm-specific versus more general market movements.
Q. Well, Qualcomm clearly labelled the graph in the way it does because it perceives that these are the explanations for the share price move, does it not?
A. It is certainly annotating the chart to show that, you

know, you may therefore infer from a movement that it is causative. You know, from a corporate finance perspective, the extent to which that is actually true is, you know, to be debated, but I think one of the other things that I do think comes out from this chart is it is important to look at the bottom left. You will see that the axis there goes down to $45. What you do not see here is that the share price shoots down. This is not a company -- certainly not from its share price, it does not appear to be in distress.
If it is correct that -- let us imagine all of these movements are caused by the dots, you know, the numbers, so what one is imagining here is that there is a $10 movement in a share price caused by these kinds of announcements. That moves it from $65 to $55.
Q. Your evidence, let me understand it, is that it is -- even though they are in this perilous situation because they are not being paid by Apple or Huawei, you are suggesting that credibly they could cut off Samsung's chipset supply at that time? Is that your evidence? Is that still your evidence?
A. Yes, it is.
Q. I suggest to you that that is simply not realistic.
A. Well, and I would generally highlight that there are lots of businesses, particularly in the technology

sector, where their evaluation is based on future expectations about revenues. The -- if what you care about is a high profitability part of your business, like your licensing business that you expect to be generating significant revenues over a long period of time, then you might take short-term actions which are costly to you, but your expectation is and your hope from those is that they will have longer term positive profit impacts for you and that ultimately that -- it is that strategy that is value enhancing for your shareholders.
Q. Very well.
There is just one other issue I should touch on. You are aware of Mr Gonell's evidence that it is possible to obtain licences that are tailored to licensed products consisting of a particular generation of handsets? Do you recall that evidence?
A. Yes.
Q. So, for example, if, for example, Samsung or Apple considered that it needed to be guaranteed access to Qualcomm's 5G chipsets, it could have obtained a licence restricted to a 5G device licence, whilst leaving itself unlicensed for 4G UMTS-LTE licences. Do you recall his evidence to that effect?
A. Yes.

Q. Now, I do not -- I am not going to ask you to comment on the correctness as a matter of fact. That is for the Tribunal, but, just to be clear, that potential ability to pick and choose licences for different product generations, that is not something that you factor in to your bargaining model, is it?
A. It is not explicitly modelled in the bargaining model, no.
MR JOWELL: Thank you. I have no further questions. I do not know if there is time for Mr Saunders. We might need to go --
THE CHAIR: Well, how much re-examination do you have, Mr Williams?
MR WILLIAMS: At the moment minimal, Madam. Minimal, if any.
THE CHAIR: All right. So can I allow Mr Saunders ten minutes on the empirical analysis and then give you five minutes at the end? Thank you.
MR SAUNDERS: I am grateful.
Cross-examination by MR SAUNDERS
MR SAUNDERS: Good morning, Mr Noble. I take it you are familiar with the Padilla leveraging report?
A. Yes.
Q. Now, there are three separate analyses in there, are there not? There is one for Apple, one for Samsung and

also the analysis for all the OEMs?
A. Yes.
Q. I also think there is no dispute between you, as I understand it, about the underlying arithmetic that led to the plotting of those individual graphs, the starter work that was done?
A. Which chart do you have in mind?
Q. Well, just the individual graphs in the analysis. There is no dispute about the underlying arithmetic, I think. There are disputes about how you go about doing this, but I do not think there is a problem with the adding up or the running of the --
A. Well, there is a dispute about some of the dots, I think. I do not know if I am allowed to say which ones.
Q. There are some disputes about specific things, are there not, in relation to -- I will come on to some of those specific points very briefly, but other than those specific things that you call out in your report, you are fine with the arithmetic; is that right?
A. Yes, correct.
Q. Right. Now, the work was done by Dr Chowdhury and a team at Oxera, was it not?
A. Yes. Sorry, which work?
Q. The work looking at Dr Padilla's leveraging report?

A. No.
Q. You say you have been assisted by Dr Chowdhury and a team of five people?
A. Yes, correct.
Q. They have done a very thorough job identifying potential points, have they not, as you would expect?
A. Well, yes. Well, I was leading the work, I should clarify that.
Q. What they have not done is identify any points in favour of the analysis. They have not done any quantitative work of their own to show a positive correlation, have they?
A. No.
Q. Some of the points that they identified are quite granular, for example, the effect on a ZTE licence in 2011 was one of the things that was called out and it is fair to say that they have done a very detailed job looking through all of the information, have they not?
A. Well, you keep saying "they" I would say "I".
Q. Your team supervised by you?
A. Yes, and I, you know, for example, I mean, I do not know if I can say the word, but the dispute was specifically about discounting, for example. You know, that was, you know, in terms of the internal debate that happened with Oxera, that was my particular idea.

Q. Now, can we turn to the theory of harm and the correlations. Now, the first point you make in the joint statement is that the lack of the correlation does not disprove the theory of harm. That is right, is it not?
A. Yes, correct.
Q. You say the theory of harm does not require a correlation?
A. Yes, correct.
Q. But your approach to NLNC is that it increases the cost of the outside option such that it becomes not a credible outside option. That is correct as well?
A. Yes, correct. That is the direct effect.
Q. So one would -- it would be very surprising in those circumstances if there was not some sign of a correlation somewhere?
A. Not necessarily, no.
Q. I mean, it is fair to say I think that the analysis, subject to the limitations you have identified, has not identified any correlation, has it?
A. Dr Padilla's analysis?
Q. Yes, has not identified any correlation?
A. No, he has not and I -- when I went through it, I did not identify a positive correlation either.
Q. Right. Can we look at the two mechanisms for indirect

correlation, because one of the points you make is that the report -- that Dr Padilla -- implicit in Dr Padilla's approach is that the data are independent events. So can we look at the two mechanisms by which you say they could be correlated. Can we look at your seventh report {EAOE/17/12} bottom of the page, paragraph 2.18?
A. 2.?
Q. 18.
A. 18. Yes, I have that.
Q. You say that:
"Licensors' rates struck with other licencees can be a relevant reference point in licence negotiations."
So if Qualcomm has leveraged to increase for OEMs that do buy significant volumes of chipsets, it could use those at reference points. Do you see that?
A. Yes.
Q. Then you go on to talk about, just over the page, some evidence from Dr Schneider and Mr Melin. In paragraph 2.20 you talk about Mr Melin's evidence and you talk about the non-discrimination aspect of the FRAND. Do you see that?
A. Yes.
Q. Now, can we just turn up one of the paragraphs you cite there, Mr Melin's report, paragraph 63 {POE/13/27}. So

in paragraph 63, did you read that at the time you prepared your report?
A. Yes.
Q. Now, what Mr Melin is saying there, you will see there, the licensor's obligation to comply with the ND part of FRAND needs to maintain control -- I am reading about halfway through:
"Not only is offering dissimilar licence terms to licensees that are not similarly situated legitimate, but each licence negotiation is distinct, and non-discrimination does not require that similarly situated licensees are offered identical terms."
A. Yes.
Q. So you saw that at the time you were preparing your report?
A. Yes, I did.
Q. I mean, the point that Mr Melin is making is the non-discrimination limb of FRAND does not lead to universal outcomes, does it? It can offer different rates to different at least situated licensees, can it not?
A. Yes, precisely, and that concern about the fact that people might be differently situated is another debating point between Dr Padilla and I, but, you know --
Q. But can we -- I mean, this argument that there is this

correlation, it only relates to those that are similarly situated, does it not, because the non-discrimination limb only applies to OEMs that are similarly situated and you have not identified the ones that are similarly situated, have you?
A. Well, the logic of the mechanism that I am outlining here is that because there is an obligation on different OEMs to -- sorry, on a licensor to offer non-discriminatory terms to different licensees, what that can mean is that in any individual negotiation that in negotiation A, that negotiation then has reference to entities that are similarly situated to entity A and, you know, in negotiation B, with entity B, there is, again, a similar discussion. So what that would tend to mean is that any individual dot on that chart would then be sort of pulled more closely to equivalent dots on that chart.
Q. But, Mr Noble, if you are going to look at that argument, it is a prerequisite of doing it, is it not, to identify which licensees are similarly situated to other licensees and that is something your team and you have not done, is it?
A. No, I do not think it is a prerequisite of that because it is rather the other way round, that if you want to draw informational value from a correlation analysis,

you need to think carefully about how independent each dot is and what this is saying, and I think what this -- Mr Melin's report is saying is that the dots essentially relate to one another and of course --
Q. Mr Noble, they do not relate to each other, unless they are correlated in some way. That is the point you are making.
Can we look at your report because time is tight. Page 13 {EAOE/17/13}, paragraph 2.21. "This implies that Qualcomm could have been relying... and [it] could have used this to influence ... Furthermore, the non-discrimination could give Qualcomm a pretext..."
Do you see that?
A. Yes.
Q. I mean, these are all hypotheticals, are they not?
A. Well, and that is because I have not seen information about, you know, all these different negotiations so I cannot know with certainty the extent to which --
Q. Mr Noble, you cannot just pick theoretical holes in this analysis without testing their validity, can you, because that is not assisting the Tribunal in determining how -- whether these points are actually significant problems for the way that Dr Padilla has approached this or not?
A. Well, I mean, my concern here is that it is

a significant problem because, you know, what Mr Melin describes is essentially the expectation that this may well be a factor that is taken into account in these kinds of negotiations and you can imagine that, you know, if we go back to the examples I gave, if you have an entity, whether our obvious similarly situated entities, those are very easy comparators, but I think you can also envisage scenarios in which there might be other benchmarks, other comparators that are used, and distinctions are drawn to say: well, okay, this person gets a lower rate because of X or Y, and then you can sort of infer from that: well, I should get a higher rate than them or I should get a lower rate than them.
Again, for me, the critical question with this mechanism is: how independent do I think these dots are?
Q. Mr Noble, you just mentioned in your answer a second ago that this is during the course of negotiations. That is right?
A. Licence negotiations, yes.
Q. Yes. Now, both the experts, Dr Schneider and Mr Melin, have both said that, generally speaking, you do not get to see these other -- the details of the other licence agreements during negotiations, do you? Are you familiar with that?
A. Yes.

Q. So that is a significant problem, is it not, for this theory to work because the OEM is not aware of this problem?
A. Well, the evidence that I have seen in the Apple and Samsung negotiations is that Qualcomm gives indications about, you know, what the market rate is. I mean, there is lots of quotes where they talk about it has been established again and again in licences that rate X or Y is the appropriate rate.
So Qualcomm is at least asserting in those situations that there is information or content coming from these other licences and it is informing them of that.
Q. But those are again factual questions for the Tribunal to assess?
A. Yes.
THE CHAIR: Mr Saunders, I think your time is up.
MR SAUNDERS: I think I probably am out.
THE CHAIR: Thank you.
Mr Williams.
Re-examination by MR WILLIAMS
MR WILLIAMS: I just had one point, Madam, and it is just a chance to give Mr Noble a chance to complete an answer, if he wants to.
Could we go back up to the bottom of page 89 on the

[draft] transcript, please. Can you see that, Mr Noble, if we bring it up? At the bottom of page 89, line 17, Mr Saunders asks you question:
"But, Mr Noble ..."
Then you start to answer that at line 22 and then, on the next page, we can see he cuts off your answer. I just want to give you a chance to complete that answer, if you did not get a chance to complete it.
A. Could I just re-read the question?
Q. Yes, please do. (Pause)
A. So the point that I was getting at here is that I do not think it is a prerequisite to analyse every individual negotiation and consider exactly which OEMs are similarly situated to which other OEMs. The concern is a more generalistic one, that we have lot of dots on the chart and that the licensing experts have highlighted that there is this dimension in licensing negotiations, where licensors have a non-discrimination obligation, and I have seen factual evidence that indicates that Qualcomm essentially points to that and points to what it asserts in those negotiations is the outcome of those kinds of negotiations.
So I do not think one has to identify specific examples of this. I think one can, in a sense, draw a broader conclusion that the -- that there is a concern

about the independence of each of those individual dots on the chart.
MR WILLIAMS: Thank you. I do not have any other questions. Thank you.
THE CHAIR: All right. Thank you very much.
So, Mr Noble, thank you very much for your answers this morning. That concludes your cross-examination.
We will now take an hour for lunch and we will return at 2 o'clock when Dr Padilla will be sworn in and cross-examined by -- is it going to be just you, Mr Williams, or you and Mr Armitage?
MR WILLIAMS: It is just me, for better or worse, Madam.
THE CHAIR: Thank you very much.
All right. 2 o'clock.
(1.00 pm)
(The luncheon adjournment)
(2.00 pm)
In Open Court
MR JOWELL: Good afternoon, Dr Padilla. Dr Padilla, could I show you first your third report which is in the core bundle 33 --
THE CHAIR: Mr Jowell, Dr Padilla needs to be sworn in.
MR JOWELL: I made the same error. Yes, of course. You need to be sworn first.

DR JORGE PADILLA (sworn)
Examination-in-chief by MR JOWELL
MR JOWELL: Core 33 {EAEO/12/1}. We see this is a copy of your third report?
A. Sir, I do not have any copy with me.
Q. You should see it on the screen, perhaps.
A. Oh, there, yes. Excuse me.
Q. We should, I think, have -- Dr Padilla, I think should be provided with a copy of -- it is coming. (Handed)
A. Thank you.
Q. If you go to page 4 of the report --
A. Sorry, could you remind me of the tab?
Q. It should be core 33. I think -- is that the same -- oh, I imagine it will be the first tab. {EAOE/12/4}. The first tab, yes.
A. I think what I have here is, I believe, is the bundle of documents to be for cross-examination, but not my reports.
Q. Not the -- you should have a clean expert report bundle. (Handed)
A. Thank you. Now I am there.
Q. You are there?
A. Yes.
Q. Go, please, to page 5 of the -- of the first tab.
A. Right.

Q. Is that your signature?
A. Correct.
Q. If we could go, please, to tab 4 of the bundle before you, which is core 33, or {EAOE/22}. If we could go -- is this your fourth expert report?
A. Correct.
Q. If we could go, please, to page 104 {EAOE/22/104}.
A. Yes.
Q. Is that your signature?
A. Correct.
Q. If we can go, please, to tab 7 in this bundle, core 38, {IRE/25}. Is this your fifth expert report?
A. Sorry, which tab?
Q. Tab 7.
A. Tab 7, yes, this is my fifth expert report.
Q. If you could go, please, to page 8 {IRE/25/8}.
A. Yes.
Q. Is that your signature?
A. Correct.
Q. Finally, if we could go to the joint expert statement, which you will find in tab 6 of the bundle before you {POE/24}. If you could go, please, to page 3 of that {POE/24/3}, again, is that your signature?
A. Correct.
Q. Are those reports and that statement true to the best of

your knowledge and belief?
A. Yes.
MR JOWELL: Thank you. Please wait there.

Cross-examination by MR WILLIAMS

MR WILLIAMS: Good afternoon, Dr Padilla.
A. Good afternoon.
Q. Madam, I am going to start in open and I hope to stay in open for most of the cross-examination. I am going to have to go into closed at the end, but I have grouped the questions.
Dr Padilla, one of the disagreements between you and Mr Noble is whether chips that are compatible with different standards are in the same markets and this has two aspects. One is whether a chip that supports an earlier generation of standard is a substitute for a chip that supports a later generation of standard. That is one issue. Do you agree?
A. Correct.
Q. Another is whether a chip that is only compatible with UMTS is a substitute for a chip that is compatible with CDMA 2000. That is a separate issue?
A. Correct.
Q. So what I am going to do at various points in the cross-examination, because we do not have a lot of time, is try and summarise what I think is the state of the

evidence and put it to you to see if you are happy with the summary, rather than take to you every reference, and we will see how we go with that, if that is acceptable?
So the first point is substitution between earlier and later generations. In his report Mr Noble cites evidence provided by OEMs to the European Commission, which he says supports his view that a 3G chip, for example, is not a substitute for a 4G chip. Do you recall that evidence?
A. Yes.
Q. Just to summarise the position: Mr Noble says this is the perspective of the customers who are buying the chipsets and they say they are not substitutes, and you say that the opinions that are contained in those submissions come too late to illuminate the moment of transition and you say it is the moment of transition that matters. Is that a fair summary?
A. I think that that is correct, but not -- it does not reflect completely my position.
Q. Right. Well, I am going to look at the -- that question of the moment of transition. If you want to clarify your position as we go through, then you can do that.
So can we bring up {POE/21/108}, please, which is appendix A3 to Mr Noble's report. The first of those is

non-confidential. It is statements made by Apple. Do you see the second sentence, it says:
"Consumers expect Apple's devices to include the most recent technologies."
Do you agree that that comment is addressing the point of transition?
A. So --
Q. It is saying once there is a new standard consumers expect Apple to supply a device that complies with it?
A. Sorry, I am a little bit lost. Apologies for this. You are asking me to look at what entry -- what Apple wrote?
Q. The Apple block and the second sentence -- well, you can read the first sentence. I was stressing the second sentence which is:
"Consumers expect Apple's devices to include the most recent technologies."
So that is stressing the point of transition. It is saying once there is a new standard. consumers expect Apple to supply a device that complies with the new standard.
A. I do not recall now who said that on behalf of Apple or whether this is Apple saying this, but whoever held that opinion, I am pretty sure that he held it in good faith. That does not tell me much about Apple's actual behaviour, because Apple's actual devices do not tend to

include the most up-to-date technologies.
Q. Yes, but this is not Apple looking back several years; this is Apple talking about the need to transition to a new standard when the standard comes in. That is what this is saying.
A. Right, and all that I am saying is that, based on the facts, Apple chooses when to introduce the new technologies and I would not say never, but rarely is it a first-mover.
Q. Can we please bring up {POF/842}, which is a Qualcomm internal presentation from March 2018, about a year in advance of 5G going live, and it relates to an unnamed customer. Now, I understand from paragraph 8 of your report that your role did not extend to the interpretation of documentary evidence like this. Does that mean you did not look at documents like this generally when you prepared the report?
A. Correct. I looked at them. I mean, looking at documents and analysing documents is a completely different thing. So I looked at some documents, especially when the documents were introduced as evidence by Mr Noble, but I did not conduct an analysis of documents, meaning I did not look at or did not consider whether all the documents in the file were a representative sample of all the documents in the case.

I did not look at all the documents. I did not pre-register the analysis that I wanted to do with documents and, no, you will not find statistics from me saying of all the documents that I looked at, these point in this direction and those point in the other direction.
So I did not do an analysis of documents.
Q. I am not going to ask you to comment on what the facts were. I just want to look at some documents in the context of the economics.
A. Very good.
Q. Can we look at page 5 of this, please {POF/842/5}. This sets out the benefits of 5G for user behaviour and you can see reference to latency, speeds, coverage and capacity and you see all of that on that slide; yes?
A. I am looking at the slide now for first time, looking quickly. I am prepared to take it from here. I cannot -- you know, no objection from me.
Q. Then if we turn through to page 16 {POF/842/16}. This is outer ring confidential and I will not read it out. I would just like you to look at it. This is one of many documents that the Tribunal has seen which relate to Qualcomm's perception of its leadership position in 5G and just while we are going through this, I wanted you to look at the text at the bottom right which deals

with that and refers to a track record which is one of the issues you discussed with Mr Ridyard last week. Do you see that?
A. Yes, I see that.
Q. Now, the slide I want to move on is to 22 {POF/842/22}. Now, this refers to a survey of about 6,000 consumers. Now, this is not confidential. Have you seen this before?
A. Let me just look at the source. Who has produced this survey? Qualcomm Technologies?
Q. I think it is a survey that was produced for Qualcomm, I think, as I understand it.
A. No, if I have seen it, I do not remember.
Q. This is material, I think produced by Qualcomm, in relation to the transition from 4G to 5G from the consumer perspective. Do you see that it says that about half of all consumers are likely to shift to a 5G device once that is available? Do you see that on the right-hand side?
A. That is when they say:
"50% likely to purchase a phone that supports 5G when available"?
Q. "When available"?
A. Yes, I can see that.
Q. Yes. In fact, if you look to the left of that, it says

an even higher percentage expected to get a 5G phone when they next change phones. Do you see that as well?
A. Correct.
Q. So this is Qualcomm's own analysis of consumer demand when it was planning its strategy for 5G and Qualcomm's assessment was that there would be distinct consumer demand for 5G devices as soon as there was transition to the new standard. Do you agree with that?
A. That is their assessment based on this report. This report was, sorry, published when?
Q. It states from March 2018.
A. But the report is September 2017?
Q. That is right. Sorry, you are quite right. The survey goes back six months previously or so.
A. So they were speculating what was going to happen in 2019 in 2017?
Q. Well, they asked consumers what was their attitude to switching to 5G when 5G came -- became available, it would appear, because that is what the consumer answers say.
A. Right. I follow. That must have been -- just to make sure I do not provide an answer that is incorrect. The September 2017 date is the date -- presumably the survey was conducted before September 2017?
Q. Presumably.

A. Presumably. Right, look, I think that that may be the opinion of Qualcomm, but that is based on —— well, first, its opinion, I do not know whether this was a scientific opinion or a marketing opinion, and —— but, most importantly, the point is this was contingent valuation. "Contingent valuation" means you are asking people what are you going to do and I think that it is very well—known that people answer sometimes in a very imprecise way and that is why very often the answers to these hypotheticals differ very much from what happens in the actual.
2017 is relatively early. I am not sure what information was provided to consumers as to what were the use cases for 5G and the only thing I will notice is that it seems that Apple was not particularly impressed by the survey because they decided to enter in 2020, as opposed to ——
Q. It is a Qualcomm survey. No one is suggesting that Apple was impressed by the survey.
A. Right. Look, it is a piece of evidence, but as an economist I cannot give you assessment of how reliable it is.
Q. So Mr Katouzian, who is the Qualcomm witness on the chipset side of the business, was asked about this. Can I show you what he said. It is {Day6/117:17}. This was

in private session so I will not read anything out. It should come up on the screen for you.
EPE OPERATOR: If it was in private, I do not have the transcript.
MR WILLIAMS: That is a challenge.
THE CHAIR: Yes. Unless you have it in hard copy.
MR WILLIAMS: Well, can I put to Dr Padilla what Mr Katouzian said by way of headline conclusion, Madam?
THE CHAIR: Let me just see if I have the transcript.
A. I am prepared to accept whatever you tell me that he said.
THE CHAIR: I just wanted to check that there is nothing sensitive in it. Day 6, the full transcript.
MR WILLIAMS: Page 117, line 17, down to page 118, line 16. I was not going to go into the —— we have it on Opus {POS/13/31}. Thank you to Mr Armitage.
THE CHAIR: Right.
MR WILLIAMS: Down at the bottom of page 17, sorry, 117, you can see just the last point on this document, page 22. That is the slide you have just seen. Then if we just go down onto page 118 ——
A. 118?
Q. Yes. We can see ——
A. Which line?
Q. Line 10 through to 16.

THE CHAIR: Oh, yes, I do not think there is anything confidential there.
MR WILLIAMS: No, exactly. So the —— it is put to Mr Katouzian from the perspective of OEMs buying chipsets, 4G chips were not substitutes for 5G chips, were they?
We have seen the perspective of Apple and other OEMs. That is the perspective of Mr Katouzian, who is in the business of selling the chips.
This is what I want to put to you: in your report you draw an inference about whether there is substitution between chipsets across these different standards based on the pricing of handsets at one level removed, but we do not need to work this out indirectly, do we? We know what the parties buying the chips thought and we know what the parties selling the chips thought, which is that they are not substitutes?
A. This is not the right analysis from the perspective of my report. Here what Mr Katouzian seems to be saying, and I agree with him, is that if you want to build a 5G phone, you need a 5G chipset, if you want to build a 4G phone, you need a 4G chipset and you cannot use a 4G chipset to build a 5G phone. That, I think, is uncontroversial and I fully agree with it.
I think that the point is whether when Apple is

negotiating with Qualcomm, for example, for the acquisition of 5G chipsets, if Qualcomm demands too much, whether Apple can say, "I am going to buy a few less 5G chipsets because I am going to be selling more 4G chipsets. I am going to buy a few less CDMA chipsets because I am going to buy a few more UMTS chipsets" and this is because ultimately they are going to sell a different product mix of phones.
Q. I understand that is the theory, but all you have done is look at the relative pricing of devices one level downstream, is it not? That is what you have looked at?
A. But that is the only thing that I need to do because the level of —— the prices of the devices downstream tell me that if a CDMA phone and a UMTS phone are selling for prices that are very similar, that is basically telling me, if we think about Apple, that Apple has exploited its relative market power on both dimensions to the point in which if there was a further increase in the price of a chipset and the CDMA using that chipset became less attractive, then there would be substitution.
Q. I think you have moved on to the next topic now so that is where I am going to go now, which is substitution between UMTS and CDMA. I think the debate on this moved on in the hot—tub so, again, I am going to summarise

where I think the debate moved.
As I understand it, you agree with Mr Noble that if an OEM wants to launch a CDMA phone, as Apple did with Verizon in 2011, then it needs a CDMA chipset?
A. Correct.
Q. Your evidence, I think now anyway, is that this is not about whether CDMA and UMTS are substitutes at the point of launch; it is about the ability of OEMs to discipline Qualcomm, for example, by placing more emphasis on selling UMTS and CDMA, for example, by switching their marketing efforts. Is that a fair summary of where we got to?
A. I think that this has been my evidence all the time. I have never claimed that you can produce a CDMA phone with a UMTS chipset or vice versa. I have always argued that in the context of the markets that I am considering, the OEM, because it is a multi-product company, can use the fact that it is purchasing multiple products to discipline each and every one of the inputs that are provided by the input supplier. In the same way that a supermarket, which is a multiple product company, can, you know, use, for example, the fact that it is buying a range of products from an input supplier to discipline the prices of those where the input supplier is relatively stronger.

Q. Well, we will come back to some of that in a bit, but just so I am clear: your report talks about OEMs' demand for chips being derived from consumer demand, but I do not think you make the point, do you, that if Apple does not like Qualcomm's chip prices, it can steer customers away from CDMA towards UMTS? I do not think you put it in that is way in the report, do you?
A. We -- I explain it and the following -- and this is the reason for the price overlap.
Q. Sorry, I am sorry, Dr Padilla, we do not have very long this afternoon. Do you make that point in your report?
A. It is. If you want, I can explain.
Q. Well, maybe your counsel can take you to that in re-examination, but if you say it is in your report. I mean --
THE CHAIR: But could you explain briefly what your response is, because you are being asked about it.
A. Yes, this is a point that we started to debate in the hot-tub but we did not go very far and this has to do with the price overlap.
So think about Apple has two phones, a CDMA phone and a UMTS phone and Apple is pricing both phones. Apple in the iOS space has some market power. I am not going to say whether it is dominant or not. I am going to say simply that it has some market power. So it is

going to bring the prices up to a point in which it is, you know, in a sense taking them at a point in which there is going to be substitution, otherwise you could increase the price of one even further.
Now, consider that there is an increase in the price of one of the chipsets, the CDMA chipset, for example. If there is some pass on and given the level of the prices that the downstream devices already have, then there is going to be substitution. You may wonder -- you may worry are you arguing cellophane fallacy. Are you falling into the cellophane fallacy? The answer is no and the answer is because the cellophane fallacy occurs by reference to high prices of the product that you are testing, whether or not it belongs to a separate market, in this case the chipset.
All that I am saying is that the prices at the downstream level are already high because there is exercise of market power and this is a general proposition that, you know, is much more difficult to hold market power as an input supplier than as somebody that controls directly the demand of consumers.
THE CHAIR: Thank you.
MR WILLIAMS: So I understand broadly what you say about that and what you said in the hot-tub, Dr Padilla, but I was asking you specifically whether this was discussed

in your report and I did not understand your answer there to refer to any part of your report.
A. So and I think it is explicit in the report when you look at the two principles that I used in order to assess demand-side substitution. I refer to geographic overlap and price overlap. Those are the two principles that I rely upon to talk precisely about demand-side substitution.
Q. Do you refer anywhere in your report to OEMs using marketing efforts to steer customers from CDMA to UMTS?
A. I do not recall. I think that this was something that we discussed in the context of the hot-tub in response to clarification questions.
Q. If we could just tease out the way I think this would work, if I have understood it correctly. If Apple is unhappy with the pricing on, say, CDMA, it would use marketing efforts to steer customers towards UMTS network, say, AT&T, rather than Verizon. Is that the sort of thing you had in mind?
A. So let me put it in my own words, if you do not mind. So what I am simply saying is that if Apple is not happy with the CDMA chipsets and given that it sells few CDMA phones and a lot of UMTS phones, it can move its demand, readapt its demand so that it demands fewer CDMA chipsets and more UMTS chipsets, sells fewer CDMA phones

and sells more UMTS phones. I think that that is fairly rational. It is what everybody would do if it had that option and the report explains that the option exists because of -- there are price overlaps which indicates substitution and there are geographic overlaps.
Q. I think you said in the hot-tub there was no evidence to support this hypothesis, because it would be impossible to prove if the product mix between UMTS and CDMA is already in its optimal state. Do you remember saying that?
A. No, but I am happy to take it as I said it and I think that that was correct. What I cannot prove is something that has not happened. So I think that we will need to accept that CDMA prices were really out of line with their competitive levels to see what would have been the response of Apple in terms of its optimal product portfolio and that is circular. So, no, I do not have the evidence to conduct that experiment.
Q. There is another explanation for the absence of any evidence to support the hypothesis, is there not, which is that the hypothesis is wrong? That is another possible explanation for the lack of any evidence?
A. Can you elaborate it? In which way?
Q. The hypothesis that Apple -- your explanation is the market is in an optimal state so we do not see Apple

applying marketing efforts to shift customers from CDMA to UMTS. That is one reason why there might be no evidence. Another reason might be just that this mechanism does not happen, it just does not happen in practice because the products are not substitutes?
A. No, I think that I explained myself incorrectly.
What you observe -- when I am saying that there is no evidence is because we do not have an experiment. We do not see -- we cannot determine or we cannot establish a difference between a competitive CDMA chipset and what you claim is not a competitive CDMA chipset and what would have been the reactions of Apple. So we cannot test whether Apple would have reacted or if Apple would not have reacted. So what we have is not no evidence, it is that we do not have the experiment that would allow us to produce or to test whether my hypothesis is correct or is incorrect.
Q. Well, we can come back to this a bit later in closed session.
You just touched on the cellophane fallacy there and I want to be clear what you are saying about that. Can I just start with what the cellophane fallacy is. When you are doing a SSNIP test, you are looking at whether a hypothetical monopolist supply of the focal product can sustain a SSNIP without being defeated by customer

switching. Am I right so far?
A. With one -- by and large correct, but let me just add one sentence: as need relative to the competitive price.
Q. Yes. Well, exactly. So the concern is that if you are using the real-world prices charged by an allegedly dominant firm as the starting point, there is a risk that the prices are not at the competitive level? That is exactly the problem?
A. That is correct.
Q. The risk with the cellophane fallacy is that it may lead you to define overly broad markets when you should find that the products are in separate markets. Is that right?
A. That is correct.
Q. Mr Noble finds that UMTS and CDMA are in separate markets, does he not?
A. That is correct.
Q. So if there is a cellophane fallacy, it is not misleading Mr Noble into finding a broad market that includes CDMA and UMTS. There is no risk that his conclusion is vitiated by the cellophane fallacy, is there?
A. Correct.
Q. I mean you find a broader market, do you not? Your conclusion could be vitiated by the cellophane fallacy,

I think?
A. You cannot infer from the fact that I conclude a broader market that it is vitiated from the cellophane fallacy, but it would be more likely than the conclusion of Mr Noble.
Q. Another point that came up in relation to this issue is the suggestion that CDMA and UMTS are substitutes because there is continuous variation in product mix. You said that with reference to your figure 3 and figure 4. Do you remember that?
A. Correct.
Q. So can we bring that up, please, at {EAOE/22/57}. The first -- these were once confidential, but I understand they are not confidential any more because they are based on third-party data.
The first graph shows Apple's product mix. We see two spikes which I am told launch with -- coincide with the launch of two CDMA-compatible iPhones. Is that something you have looked at?
A. Can you point to exactly --
Q. Sorry, do you see in the first -- in figure 3, if we look at 3G CDMA at the top right?
A. Right.
Q. There is a little spike just after 2010 and there is a little spike towards 2012?

A. Correct. That is my understanding at that point in time where they launch CDMA phones.
Q. Right. So that -- I mean a spike when there is a phone that is launched is not really a continuous variation in mix, is it?
A. I am not sure what to tell you to tell you the truth. It is continuous in a mathematical sense, but I understand your point that there is a spike. At that point in time, there was a significant change, much more significant than in other years, yes.
Q. Can we then look at figure 4, which is Samsung, and to my eye, anyway, those two lines track each other quite closely. Do you see that? They sort of track each other. They go up at the same time and go down at the same time and then they tail off together?
A. What are you referring to?
Q. I am sorry. We are talking about 3G CDMA and 3G UMTS. I am sorry, that is what I thought we were looking at, because you are saying there is continuous variation in the mix between them, but to my eyes those lines track each other. There is not continuous variation. They just track each other?
A. Yes. No, I think that perhaps I did not explain myself sufficiently clearly. I did not say that there was a relative change between UMTS and CDMA. All that I am

saying is that demand is not given and sometimes you sell more, sometimes you sell less, and that is the result of two things: the demand for consumers and how much and how strong you push your products. All that I was saying is that if you look at the variation between 2009 and 2012, for example, on the 3G CDMA, what you see is continuous movement in that line. I was not using -- I was not using the 3G UMTS line as a benchmark.
Q. I thought your point was about substitution between the two. Would that not depend on how volumes are moving between the two?
A. No. Again, you are asking for me to produce on the basis of these figures the sort of evidence that I tell you that I cannot produce. I cannot see how product portfolio would have changed relative to prices. I do not see -- here you can see that you see variations in relative in portfolios, yes, but I do not know whether that is in response to relative prices.
So let me put it this way: suppose -- take a look at, for example, the Samsung figure 2009. Okay? We see there relative composition of 3G CDMA and 3G UMTS in 2009. Let us look at 2012. Now you see that the proportion of CDMA is much less than UMTS. That would be a change in product portfolio that is consistent with

CDMA becoming less important, but I would not use that as evidence in support of my hypothesis. It is not evidence in support of Mr Noble's hypothesis, but it is not even also not evidence in support of my hypothesis because I do not have the underlying relative prices.
So you cannot use these figures either to credit or to discredit my hypothesis and the point that I was making with these figures was orders of magnitude more similar -- more simple, excuse me, which is that if you look at the beginning of 2009 and the end of 2009, for example of 3G CDMA, you see variation. So it is not that Samsung or Apple or anyone else is compelled to buy a given number of CDMA chipsets to produce a given number of CDMA phones. They buy in response to demand pressures, supply pressures and relative margins.
THE CHAIR: Thank you.
MR WILLIAMS: Madam, I am not being at all critical of Dr Padilla, but I am very time constrained and some of the answers are quite long.
THE CHAIR: Yes. I think you need to give more concise answers, Dr Padilla.
A. I will do my best, I promise, and apologies for that, Mr Williams.
MR WILLIAMS: I am going to move on now to OEM-specific markets and you define Apple and Samsung-specific

markets. Just before I do that, I want to be totally clear about what you mean by that. Your OEM-specific markets include chips bought by other OEMs, do they not?
A. No, that is not correct. The OEM-specific markets are chips bought by Apple and chips bought by Samsung.
Q. Yes, but within the volumes in your markets you include equivalent chips bought by other OEMs of the same type. Is that not right?
A. No, that is a misunderstanding as reflected in your skeleton. The thing is that when I compute market shares, in those OEM-specific markets I look at who could have sold into those markets, not only who have sold into those markets, and I proxy the relative strength of those that could have sold on the basis of what they sold in the market -- in an OEM-agnostic market.
Q. But you include chips that were sold by suppliers that were not selling to Apple and Samsung. That is right, is it not?
A. To calculate the market shares, yes, because I am looking --
Q. So you must include chips that are being sold to other OEMs because they are not being sold to Apple and Samsung, they are being supplied to somebody else. That must be right?

A. But, again, the market -- what I am trying to do is to proxy the relative strength of all those people that currently are not selling to Apple and Samsung, therefore they are not selling to Apple and Samsung, but could have sold to Apple and Samsung. I am using the market-wide market shares as a proxy of the relative strength.
One thing I could have done, and I explained this in the hot-tub, is to calculate capacity market shares.
THE CHAIR: I think you have given the answer, yes.
MR WILLIAMS: Okay. So you give two reasons -- two particular economic reasons for what you describe as "OEM-specific markets." One is that Apple and Samsung had distinct requirements and the other is that there is price dispersion. Do you agree?
A. Yes.
Q. So start with distinct requirements. Can we look at what is meant by that. Can we look at {EAOE/22/56}. This is paragraph 166 and actually this takes us back to the graphs we were just looking at. What we take from 166 and the graphs is that Apple and Samsung bought chips that complied with different standards at different times. That is right, is it not?
A. Yes, that is correct, but I think that the important thing is that they have different product portfolios at

different points in time.
Q. So to make that concrete, and this is a point I think you make in paragraph 158 of your report, at a certain point in time, Apple stopped buying LTE chips and only bought 5G chips, whereas Samsung continued to use LTE chips. That is the sort of point you make about the distinct requirements?
A. One of the examples, as you know, the product portfolio of Samsung is much broader than that of Apple, yes, very generally.
Q. Mr Noble's reason for not adopting OEM-specific markets is supply-side substitution and you and Mr Noble agree that there is supply-side substitution within each standard, do you not?
A. That is correct.
Q. So if we just look at that, {POE/24/12}, paragraph 20.2 in the JES. So here you say:
"The experts agree...there is ... supply substitution ... across suppliers within each standard. Our analyses are therefore both premised on substitutability across suppliers within each standard."
You also agree with Mr Noble that there is not supply-side substitution between standards. That is agreed too, is it not?
A. Correct.

Q. So there is a lot of common ground actually on those points.
A. On those two points, yes.
Q. So if I just come back to the distinct requirements that you identify in paragraph 166. What we see from that is that Apple and Samsung decide when to launch handsets complying with a new standard and when to withdraw phones that only comply with the old standard. That is something that all OEMs do, is it not?
A. That is correct.
Q. All the OEMs' timings will be a bit different, will they not? They will all decide to do that at different times?
A. Correct.
Q. None of this tells us that Apple and Samsung are buying chips on their own product markets, does it? It just shows them buying products on the same market as everyone else, just at slightly different times?
A. That is neither here nor there. I think that all this tells us is that they have different portfolios and consequently they can orchestrate substitution in different ways. Some people may do. Some people may not do. I have only looked at Apple and Samsung.
Q. So the other issue that you raise in your report is pricing dispersion. Can we just look at what you said

about this in the hot-tub. This is {Day7/24:7-21}.
THE CHAIR: You might need to give the Opus reference.
MR WILLIAMS: I am sorry. This was in open, Madam, so this one should work, I think. Here we are. You say on line 7, "There is price discrimination." At the end, you say:
"This seems to me the poster child example of a price discrimination market."
Do you remember saying that?
A. Yes.
Q. So can we compare that to what you say in your report at {EAOE/22/55}. This is paragraph 160. What you say is:
"I note that the data shows a dispersion of pricing consistent with OEM-specific pricing."
I think that is as high as you put it in your evidence that there is "dispersion consistent with OEM-specific markets". I did not read that as saying there are price discrimination markets, let alone that this is the "poster child of a price discrimination market". Have I read that correctly?
A. I am a little bit surprised, not about what is in the report but about your interpretation. I always thought it was very clear that my OEM-specific markets were price discrimination markets because, by definition, you have OEM-specific markets if conditions of competition

are different and therefore you are going to have different prices in different markets.
Q. Neither you, nor Mr Noble, have done any analysis of customer—specific pricing across OEMs taking account of the complexities of pricing like rebates and discounts, have you?
A. I mean, we have —— I have looked at the various negotiations and interactions between Apple and Samsung, including MIA, the BCPA, etc, etc, and there you can see significant differences —— sorry, you can see discounts, rebates, that are clearly OEM—specific.
Q. Yes. But this point depends on a comparison between Apple and Samsung and the rest of the market, does it not? That is the way —— that is your point about OEM—specific markets, they are different from others?
A. To the best of my understanding Apple negotiates discounts only for itself, not for the rest of the market, and there is evidence that they have negotiated discounts and they have negotiated their own chipset prices and I believe that Samsung does exactly the same. I am not aware of any OEM that negotiates for others.
Q. Paying different prices because you buy, for example, a different volume is not a difference in the conditions of competition, is it? It is just buying more or less than somebody else. Do you agree?

A. No, I would agree. Paying different prices because you have an option to self—supply that the others do not have, that is playing separate markets. Paying different prices because you can substitute across products in ways that others cannot, that is a reason to have an OEM—specific market. The logic of the CDMA/UMTS argument that I made before applies very much to Apple and Samsung because they are two companies —— two OEMs with very significant market power. Other OEMs do not have that option.
Q. Dispersion of pricing is not enough to establish a price—discrimination market, is it?
A. No. What is important is that you observe that the prices charged to one customer concretely are different from the prices charged to another customer reflecting ——
Q. To other customers, not to one other customer.
A. To other customers, reflecting the fact that that customer or customers have different options available to them.
Q. Can we look at {ABI/6/28}, please. This is the Commission's Market Definition Guidelines. I am sorry, we might need to go on to the next page {AB1/6/29}, paragraph 88. I am sorry, I have the wrong reference. Page 28 {ABI/6/28}. This is the Commission's Market

Definition Guidelines.
A. Yes.
Q. This deals with price discrimination or discrimination markets in 88. You can read that to yourself and then could you read footnote 119, please.
A. I think that I know paragraph 88.
Q. You know this?
A. Yes.
Q. I am not surprised.
A. I may have contributed also in the process.
Q. If you contributed, you will be familiar with footnote 119 which says:

"When conditions of competition and likely effects are similar across customers or customer groups, for example because of supply[—side] substitution, the Commission may nevertheless include such customers or customer groups in the same relevant markets."

So ——
A. That is correct.
Q. —— we agreed earlier on that there is supply—side substitution within a standard, did we not?
A. Yes, but that supply—side substitution is not the one that is relevant here and, by the way, just to make clear, I also wrote that report for the European Commission in May 2021 about the use of

supply—side substitution so I know very well what I am talking about. The supply—side substitution in price discrimination markets is not supply—side substitution within standards. It has to be different.
Q. I think it follows from paragraph 20.2 of the JES that if the hypothetical monopolist supplier of 5G chips were to put up prices to Apple, then you would expect another supplier to step in and defeat the SSNIP and there would be switching —— supply—side switching. I think that is your position in 20.2, is it not?
A. Sorry, let us go back to that and unpack it, do you mind, because I am not sure that I am following you? Sorry, I am not doubting, it is simply that I am not following you. Let us go and unpack it.
Q. It was 24/12 —— sorry, {POE/24/12}.
A. 24/12. Is that my fourth report? No, that is ——
Q. JES, paragraph 20.2, there is supply—side substitution across suppliers within each standard?
A. Yes.
Q. So the point I am putting to you is that if the hypothetical monopolist supplier of 5G chips were to put up prices to Apple, you would expect another supplier to step in and defeat that?
A. Another supplier of what?
Q. Another supplier of 5G chips.

A. No, because the hypothetical monopolist would control all the 5G chips.
Q. The reality here is that ——
A. There is no reality. It is hypothetical. The hypothetical monopolist would control all 5G chips. The only form of supply—side substitution that could be the price—discrimination market, and it is explained in the same JES I think, is supply—side substitution across standards and Mr Noble and I agree that there is no supply—side substitution across standards.
Q. But this is all starting from your premise that Apple has a distinct requirement for chips relating to particular standards at particular points in time, does it not? It comes back to your different requirements point?
A. If we look at my market definition, it is very clear. My market definition says there is an Apple—specific market for 5G from 20 —— if I am not mistaken, 2021, '22, '23. So the hypothetical monopolist of that market controls all 5G chipsets. All of them. Apple cannot buy 5G chipsets from anyone else.
Q. Right. We will move on.
A. Otherwise footnote 119 would not be an exception. Otherwise you would have that there would never be price—discrimination markets.

Q. Can we move on to talk about self—supply, please. In the hot—tub you said that it is intellectually rigorous and correct to include self—supply in the market, because when Qualcomm is negotiating chipset prices with Apple and Samsung, it can leverage its ability to self—supply. Do you remember saying that?
A. Yes.
Q. Now, just dealing first with Apple. Apple did not start supplying —— self—supplying chipsets until February 2025, did it?
A. I do not recall now, but, yes, let us take it as what your saying is correct.
Q. Just clearing away Apple. Apple had no ability to leverage self—supply at any stage before 2021?
A. I believe it had self—supply.
Q. Turning to Samsung, do you agree that Samsung had the incentive to self—supply as much of its chip supply as it could?
A. I think that yes and no. I mean, when you self—supply, you balance quality and price and you also try to ensure security of supply so you may —— even if self—supplying is even more economical, you may try to avoid potential disruptions by buying from a second source.
Q. Can we look at {IRC/3/7}, please, paragraph 29. This is Mr Katouzian's evidence. He says:

"It stands to reason it would be more profitable for Samsung to use the Samsung Exynos products ... rather than purchasing from a competitor."

He refers to that incentive on Samsung as part of his description. Do you agree with Mr Katouzian?
A. This is I would agree and allow me to use the expression of the economist, ceteris paribus, that is other things equal, so, yes, it is more economical and that is going to mean that other things equal, you will buy more from your own supply than from third parties, but there may be security supply issues, there may be quality differentiation issues that you want to factor in and, therefore, as a result, you multi—source.
Q. I think it is right to say that at least until today Samsung has used its own foundries to manufacture chips, are you familiar with that, rather than outsourcing?
A. I think that they use their own factories, yes, but I would not be able to testify on that because whatever knowledge I have from —— about that is from another matter.
Q. Samsung did not start self—supplying any chips until 2011 or thereabouts. Are you aware of that?
A. Samsung was ——
Q. Did not start self—supplying any chips until about 2011?
A. I do not recall, but I am happy to take it.

Q. If that is right, self—supply could not have affected negotiations prior to that, could it, 2008 to 2009?
A. No, but certainly it did after 2011 and, in particular, during the relevant period that I understand is October 2015 onwards.
Q. It did not start self—supplying CDMA until 2018. Are you aware of that?
A. I think that is correct.
Q. Can we now look at {ORI/261.15}, please, which shows shares of LTE supply. If we look at these and we see shipments to Samsung, and we can see —— that is the middle line —— you can see "device shipments" there is a line for Samsung itself, do you see that?
A. Sorry, I am trying to locate myself here.
Q. This is shares in absolute volumes of LTE chipset supply.
A. Yes.
Q. The top box is shipments to Apple. The second one is shipments to Samsung.
A. Right.
Q. You can see there is a line for Samsung. So that is Samsung shipping to itself?
A. That is shipments to Samsung, yes, and then there is Samsung and they start, yes, I can see that.
Q. Yes. So in 2012 this data shows Samsung is not

self−supplying anything to itself. I think it may be said that it actually started to supply in that year, but we can see from the figures for 2013 and 2014 that it is self−supplying less than 10% of its overall LTE chipset requirements. Do you see that?
A. It is less than 10% in which year?
Q. I was looking at 2013 and 2014.
A. Correct. Well, actually, 2014 maybe is more than 10%.
Q. There or thereabouts, is it not?
A. Give or take.
Q. Then it is buying the rest from Qualcomm at that time. We see that ——
A. These are shipments of LTE, the same time I am not sure how many LTE phones were sold.
Q. Mostly the rest from Qualcomm. It is only once you get to 2017 that Samsung starts self−supplying more than half of its LTE needs. Do you see that?
A. Yes.
Q. So what it looks like from this is that Samsung is ramping up its production over time and trying to supply more and more of its own needs for LTE. Do you agree?
A. Yes, and the point is —— the clinical point is whether it would have ramped up its production much faster if Qualcomm was exercising market power and charging a lot for the chipsets, because this may well be the result of

Qualcomm actually internalising the fact that there was an outside option, self−supply, and then moderating its prices. At one point, it seemed that not even doing so it was able to obtain half of the amount.
Q. But Samsung had the incentive, did it not, to self−produce as much as it could? We covered that earlier on. If it could have ramped up production earlier on, it would have done?
A. Not necessarily. Again, if I can ramp up production but if the threat of ramping up production means that third−party suppliers can bring their prices down, I may take advantage of that and, again, there are other issues, product differentiation, security of supply.
I think that this evidence does not help you or help me. It simply says that there is a supply, self−supply, the self−supply change over time and the actual pattern may reflect the very fact that the self−supply disciplines Qualcomm prices or not.
Q. Until 2015 the volumes are just too small for Samsung to leverage the ability to self−supply. That is the reality, is it not?
A. Look, I cannot say one thing or the other and I am not sure that you can put it yourself either. I think that we do not have evidence to say that. The volumes —— the question is: could the volumes have been higher if the

prices were different? I do not think that we have the evidence to say one thing or the other.
Q. Can we move on to a different topic, which is the materiality of CDMA for Samsung. Can we look at {EAOE/22/41}, paragraph 116, please.
A. Paragraph 11?
Q. 116. Here you say that CDMA —— 3G CDMA was a small percentage of Samsung's needs during the term of the 2009 licence. Do you see that?
A. Yes.
Q. I do not think the figure is —— the percentage is confidential any more, but we can all see it. It is a small percentage?
A. Yes.
Q. The term of that license is nine~years, is it not, through to 2018? That is the basis for that figure?
A. I think so.
Q. You say:
"I find it implausible that Qualcomm could have leveraged those limited volumes ... to extract higher royalties ..."
And so on.
But no one is suggesting in 2009 Qualcomm was leveraging the volumes it might sell Samsung nine years later. If it was leveraging, it was doing so on the

basis of what Samsung needed at that point in time and imminently, was it not? That is obvious, is it not?
A. That is actually in contradiction with the CR's prospective market power theory.
Q. Could you answer the question, rather than point out the inconsistency with another aspect of the case?
A. I —— that comes precisely because I never understood what was the theory. What we have done in the leveraging analysis is to look at sales at that point —— at the point in the time and then during the entire duration of the agreement so I think I have been consistent all throughout.
Q. I mean, can we bring up 261.10, please.
A. In any event, we can look at the percentage in that particular year.
Q. We are going to look at that now. We are going to look at 261.10 {ORI/261.10}. One can see in 2008 and 2009 Samsung is buying 34, 45, 50, 44 million CDMA units from Qualcomm. Do you see that?
A. I can see that.
Q. I think you can take it from me that total —— Qualcomm's total shipments of CDMA at about that time, they were around 200 million. I can show you the figure if you want.
A. Where to?

Q. About 200 million. I can show you the figure, if you want.
A. I am prepared to take it.
Q. So Samsung is selling about 1 in four 3G CDMA phones using a Qualcomm chip so it is about a quarter of Qualcomm's demand. So these are material numbers of chips, are they not? These are ——
A. Material number of chips for Qualcomm, which means that Qualcomm will be very careful in trying to threaten to disrupt that supply. I am not sure that ——
Q. We are focusing on —— I think your point was about the importance to Samsung, not about the importance to Qualcomm.
A. Correct, but you gave me a number now for Qualcomm, one out of four was your —— I mean, let us clarify. You said one out of four CDMA chipsets for Qualcomm was directed to Samsung. I said "Yes, that illustrates that Samsung was a very particularly important —— significantly important customer for Qualcomm". So Qualcomm would be very careful in threatening Samsung.
Q. The point I am making to you, Dr Padilla, is that in 2008/2009, whatever the position was by 2018, these are material numbers of chips that are important to Samsung, are they not? It is about ——
A. The question of whether they are important or not is

a relative concept. We need to look at —— again, we could go to figure 4 in my report and see what was the relevance of 3G CDMA for Samsung in those years, relative to the relevance of the other technologies, because that is the argument that I am using that there is substitution across these technologies.
Q. The figure of 7% in paragraph 116, it does not give a fair impression of Samsung's dependence at the relevant point in time, does it, which is 2008/2009?
A. Samsung's dependency, no, I think that it does, and, again, we can go to figure 4, because I do not think that if my memory serves me well —— let me just check, if you do not mind? I do not want to waste your time, but given that we are here, let me just ... (Pause)
If we go to figure 4, which is {EAOE/22/57}, CDMA was important, but it was not as important as UMTS. It is true that it becomes less and less important over time. So if you want to tell me that I should have restricted attention to 2009, then it is not 7%, it is a higher number. If I look at the entire duration of the agreement, it is 7% and in any event has always been much less than 3G UMTS and if we apply the argument to CDMA—LTE, then it is small, whether we look at a given point in time or over the years.
Q. The comparison to UMTS does not tell you whether Samsung

stands to lose material volumes of business if there is an interruption to its 3G CDMA supply, does it?
A. Right, but that is not point that we are assessing with market power. When we are assessing market power, what we are saying, or market definition, what we are saying is what happens if the CDMA price, the CDMA chipset price, goes up? The response does not need to be closed down the entire business —— the entire CDMA business of Samsung. The response is: I buy a few less CDMA chipsets and I buy a few more UMTS chipsets.
Q. We are back to that point, I understand.
Can we move on to an issue about market shares? There was disagreement between you and Mr Noble about whether market shares were persistent. Can we please look at {Day7/85}, please, towards the bottom. I am sorry, could we scroll on a bit. I might have the wrong page. I am sorry, I have the wrong reference. Sorry, Madam, I have the wrong reference.
THE CHAIR: It is all right.
(Pause)
THE CHAIR: Will now be a good time for a break?
MR WILLIAMS: We are almost there. Top of 85.
THE CHAIR: All right.
MR WILLIAMS: It is the bottom of page 84, top of page 85. So I think what you are saying here is Apple is choosing

Qualcomm because it is the best, but that does not mean Apple could not have made different decisions because it had substitution possibilities. That is your evidence, I think, on this question about what we read into market shares.
A. I said that, but I am not sure exactly what is the context and what is your question, to tell you the truth.
Q. So there was a debate between Mr Noble and you about what we read —— whether the market shares are persistent.
A. That is correct.
Q. Yes. Perhaps it would help to look at your graph about this. So it is {EAOE/22/78}. Now, most —— for most of the period covered by this graph, Qualcomm's market shares based on your market definition are over 50% and at times they are over 80% and I think you said in the hot—tub that market shares are high?
A. Correct.
Q. So if I understood your point correctly, it is not that the shares are not persistently high, if you just look at the graph; I understood your point to be that they are not high because Apple did not have a choice, they are high because Apple made the choices it did. That is what I understood your evidence to be. There were

substitution possibilities. That was the language that I was drawing attention to.

A. I mean, the problem that I think we are facing is that qualitative estimates are always complicated, including mine. So, you know, if I compare with the market share of Google in the search engine, which is a market of 95% more or less every single month of every single year for the last 20 years, that is persistently high. The market shares that you have here are high at points, are high -- but much less high at other points, indicating that there have been losses of market share and acquisitions of market share, and this is because we have had different technologies and players have been entering into the technologies before others and then it has taken time to catch up, but these are much more dynamic markets than the sort of market that I think it is typically characterised as the one with persistently high market shares. Again, I am using as reference the search engine market.

The other point I make, excuse me, is that to some extent the evolution is of market shares -- Qualcomm market shares is driven by the choices of a very few customers and in particular by Apple and Samsung.

Q. So I am just going to go through each of the different standards. I am not going to spend time on 3G CDMA

because the Tribunal knows what the position was in relation to 3G CDMA, where Qualcomm had pretty much the whole market share.

Can we focus on LTE, please, which is {POE/21/38}. This is Mr Noble's report. Now, the position we see from this -- and this obviously leaves out Samsung self-supply but I am focusing on Apple at the moment -- is before 2013 we can see -- well, before 2013 there are very, very small volumes so I want to pick it up in 2013 and we can see Qualcomm has close to 100% of the market and MediaTek has zero. Do you see that?

A. Yes. I was still surprised by the fact that you said you were leaving self-supply because -- Apple, because I thought that was an acknowledgement for a specific market but sorry for that. So, yes, 100%.

Q. So at this time Apple was completely dependent on Qualcomm for LTE and we saw earlier on that Samsung was in more or less the same position. It was taking over 90% or 90% of its shares from Qualcomm at this time as well. We saw that earlier on?

A. Yes, but I disagree with you. I think that what you want to say is that Apple at that point was completely dependent on Qualcomm to the extent that it wanted to produce LTE-CDMAs. It does not mean that Qualcomm --

Q. I am not talking about LTE-CDMA. This is all about LTE.

A. It was completely dependent, no, it was not completely dependent.

Q. We can see the market shares in 2013. Qualcomm has almost 100% market share and MediaTek has, I think, basically zero. So that is the position in 2013.

A. Let me look at the data in my report.

THE CHAIR: If you can just focus on this because Mr Williams is asking questions about what you see from this?

A. Yes, what I wanted look in my report is the extent to which at that point, in 2013 which is the year that Mr Williams is referring, what was the percentage of phones that were LTE-compliant by Apple.

MR WILLIAMS: I am not asking about that, Dr Padilla. I am asking you about the extent to which if Apple wanted to buy LTE chips, it was dependent on Qualcomm.

A. If it wanted to buy LTE chips, yes, I agree.

Q. If we look forward from 2013 to 2015, you can see things have moved on a bit but it is still -- Qualcomm is still at about 80% of the market and MediaTek is only at about 10%. Do you see that?

A. Yes, but at that point it becomes much more complicated, because at that point the figures that we have here are -- I think it is value because this is Mr Noble, so this is value, but anyway it is volume so this reflects

the actual choices made by the different players, including Apple. It does not tell us that Apple could not have made a different choice because MediaTek did not have the capacity to supply. As soon as you have activity in supply by competitors, then they could have sold more if they had won the socket.

Q. Apple cannot make a different choice at a point when Qualcomm has essentially 100% of the market, can it?

A. That is why I considered in 2013 that it did not have an option, but as soon as you move away from 2013, it has options, that is what the graph is telling us, especially the green line, and all that I am telling you is that the particular level of the market shares at that time is, if I may, endogenous. It is the result of the decisions, among others, of Apple itself.

Q. But if we just focus on 2013.

A. Yes.

Q. Qualcomm does not have the persistently high LTE -- or does not have a share at that point and in the years afterwards because of Apple's decisions. Qualcomm has these market shares because, like most of the market, Apple depended on Qualcomm. That is the reality, is it not? Until Apple sponsored Intel in 2015, it was in the same position as others, dependent on Qualcomm?

A. At that point in time, accepting as an assumption that

MediaTek has zero because it was not able to deliver in 2013, which I think that we need to establish that as a fact, then it would be dependent in 2013, but it could have waited a few months when then MediaTek is present in the market and, given that there are no capacity constraints at that stage, it may have been able to shift.

Again, whether or not it would have done that would depend on the relative prices, on the relative quality, etc, but the graph does not allow us to reach one conclusion or the other.
Q. Can we look at {Day7/154}, please. Can you just read to yourself lines 11 to 21. (Pause)
A. Yes.
Q. So the evidence you give here is that a threat to withhold 100% of chips is a very credible threat. You refer to UMTS chips, but I am talking about LTE. It would allow the supplier to increase royalties very significantly. We have just seen that in 2013 Qualcomm could withhold what was essentially 100% of LTE chips for both Apple and Samsung. So, on your own logic, the threat to Apple and Samsung in 2013 was credible, was it not?
A. I think that there are a number of non sequiturs in your statement, if I may.

The first one is to the best of my understanding there was no threat. Secondly, the threat that I am referring here is not dated. It is -- I am killing you from the UMTS market, not in a particular point in time, but forever and ever.

You have the option to delay or anything like that, so I think that we are talking about very different scenarios. Plus, as I mentioned before, the fact that in 2013 Qualcomm has 100% would require, you know, we will need to check that indeed MediaTek was not capable of providing, that Apple and Samsung did not have the option to delay for a few months and so on and so forth. So this hypothetical that was used for illustration, saying there is a point in which if you control everything, of course you have a credible threat, but what you have in the picture is something that is very distant from Qualcomm controlling everything. It is having 100% market share at a particular point in time for two types of chipsets when there are competitors that, at least a few months later, are in the marketplace.

So very different.
MR WILLIAMS: I think that is a convenient moment, Madam.
THE CHAIR: All right. We will take five minutes.
(3.13 pm)

(Short Break)
(3.21 pm)
MR WILLIAMS: Dr Padilla, in the light of the discussion we just had, I now want to go back to a different topic which is bidding markets, which was addressed in the hot-tub. Can we please bring up {AB3/14}. It is at tab 1 of the hard copy bundle you have there, page 14. Is that right? {AB1/3}, is that -- that is it. Page 14 {AB1/3/14}. This is the CMA guideline dealing with bidding markets and it sets out criteria for a "bidding market". I do not think these criteria are addressed in you report, are they?
A. No, they are not.
Q. So we can see the criteria in this paragraph at the top of the page. The first criterion we see about four lines down is that tenders are large and infrequent so that suppliers are more likely to bid. Just pausing there, there was some discussion yesterday of whether Apple and Samsung were in a different position as far as that is concerned. Do you recall?
A. I do not recall.
Q. So I think the discussion was along the lines that Samsung has a large number of competitions -- models and a large number of competitions for different slots. Do you recall that discussion in contrast to Apple?

A. Yes.
Q. I do not think you have said that every Samsung slot is a separate bidding market, have you?
A. No, I did not say that. It could be, but I did not say that. I am not defining markets at the slot level, but at the OEM level.
Q. So I think the focus here was on Apple, which has tended to let a smaller number of exclusive contracts. Have I understood that correctly?
A. No. I think that in both instances, both Apple and Samsung, my view is that what they do is that they have slots and then there is competition for those slots. I do not think that they are necessarily separate and I do not even define separate markets per slot, but there are discrete opportunities, more opportunities in the context of Samsung than Apple, but discrete opportunities.
Q. I am sorry to talk over you. I do not think saying there is competition for slots means there is a bidding market though, does it? We are looking at criteria for a bidding market here in the CMA guideline?
A. No, I am saying it is one of the criteria.
Q. Yes.
A. We can go through all of them, if you wish.
Q. I mean, if we focus on Apple, you can see one of the

criterion, if we look about two-thirds of the way through the paragraph -- halfway through:

"... suppliers are not differentiated (so that for any particular bid, all suppliers are equally [well] placed to win the contract)."

Then it goes on to say:

"... if competition at the bidding stage is effective, this currently high market share would not necessarily reflect market power."

Now --

A. So I did not follow that. You are looking the first bullet of this page "bidding markets"?

Q. I am now focusing on the words where it says "This is more likely to be the case" and one of the criteria is that all suppliers -- sorry:

"... suppliers are not differentiated (so that for any particular bid, all suppliers are equally well placed to win the contract)."

Then it goes on to say -- to refer to the need for competition at the bidding stage to be effective.

Do you see that?

A. Yes, and I agree with that proposition, but that does not mean that there is no differentiation whatsoever.

Q. I have not asked you any other question yet, Dr Padilla?

A. Excuse me.

Q. The exclusive deal that Apple did in 2011 and indeed in 2013 included 3G CDMA, did it not?

A. I believe so.

Q. We have just seen that in 2013 Qualcomm essentially had 100% share of the market for LTE, we saw that, did we not?

A. Correct.

Q. So there was only one supplier that could offer Apple an exclusive contract that included 3G CDMA and then LTE in 2013, was there not, and that was Qualcomm?

A. Again, in that particular year, if the launch was that particular year, Samsung -- sorry, Qualcomm would have been in a strong position and there is a fact that will need to be checked which is whether MediaTek was able to deliver, given that it entered the market a few months later. I am not able to opine on that.

Q. I am going to move on now to 5G and with some trepidation, I am going to talk about prospective market power, but I am going to try and avoid the language and I am going to try and talk about the market position in April 2019.

A. Okay.

Q. So the first 5G devices came on the market in March 2019, I think. Does that sound about right?

A. I think that that is correct. That is correct.

Q. So April 2019 was very, very early days, but the product did actually exist on the market. There was a 5G chip in a 5G phone at the time?

A. I think it was Samsung that first released the 5G phones.

Q. Yes, the first --

A. At some point in 2019.

Q. So although we have ended up talking about prospective market power, by April 2019 at least this was a real market, it was not a prospective market?

A. Yes, there were chipsets, yes.

Q. It is in the nature of these projects that there is a decision about which chips to use before the chips are in commercial supply and considerably in advance of the handset coming on the market. That is right, is it not?

A. The choice is for the OEMs to make. Some of them anticipate. Some of them do not anticipate much.

Q. Yes, but they do not anticipate two weeks before the phone goes on the market, do they?

A. I doubt it. I am not an expert. I think that -- but I doubt that it would be two months before.

Q. I mean, in April 2019, the prospective aspect for Apple is who is going to be able to deliver the chips I need in April -- sorry, in late 2020. That was Apple's decision at that point in time. Do you agree?

A. Assuming that late 2020 was set in stone and it was not part of the negotiation.

Q. Yes. So I am going to cut this a bit short. You have seen the market shares in Mr Noble's report for 5G, have you not?

A. Yes, I do not -- I have not memorised them.

Q. Okay. Perhaps I will just bring them up. It is {POE/21/42}. So you can see where the line sits. This actually includes Samsung self-supply at this point.

A. Correct.

Q. Just to clear something up, you said a few times last week that MediaTek had become the leader, I think, market leader by 2023, but certainly we can see from this MediaTek is not and has never been the market leader in 5G, has it?

A. I believe that I was correct. I do not remember exactly the data that I was using. It is a factual issue that we can check in due course and that is my recollection.

Q. So what I want to put to you is the Class Representative's case. I am not expecting you to agree with the case, but I want to put it to you. What we say is that in April 2019, Qualcomm was way ahead of the competition on 5G. Qualcomm knew that. Apple knew that. That was the basis on which they entered into the suite of agreements they entered into. If that is

right, there is nothing conceptually novel about calling that market power, is there?
A. The point -- let us go to the facts. So what you are telling me is Apple launches in 2020. In 2020, MediaTek had chipsets in the market, not chipsets that were going to be in the market, chipsets that it was selling in the market. I do not think that they had those chipsets for two weeks either. If they were already selling them in 2020, it is because they were ready for somebody at the point in time in which that somebody could acquire those chipsets and that must have been 2019, a bit earlier. So in 2019 Apple could choose to go with Qualcomm or to go with MediaTek.
Q. I am sorry, Dr Padilla, we are short of time and I put to you very simple point, which was that on the facts, as the Class Representative advances them, as at April 2019, it is not conceptually novel to say that Qualcomm had market power in 5G in a world where it had a 77% market share and it was the undisputed market leader?
A. I disagree with you, because I think that what you are looking at is at the market share which is the result of the choice of the company that you said that was subject to that market power.
THE CHAIR: That is what you call endogenous?

A. Endogenous.
MR WILLIAMS: Can we look at {EAOE/22/84}, please. 256. Maybe we need to start on the previous page, just so you can read it {EAOE/22/83}. I do not know if you have a hard copy. It might be easier for you to look in your hard copy.
A. 256 in --
Q. It is page 83, I think. 256(b).
A. Yes.
Q. So here you refer to a Qualcomm internal document which -- it is inner ring confidential so I will not read it out or will not say what it says. It is footnote 371. You refer to a document which you say contradicts Mr Noble's assessment of Qualcomm's market power at that time. Do you see that point?
A. Let me just read it.
Q. Please refresh your memory, yes. (Pause)
I want to make a simple point about it.
A. I have read it.
Q. That document dates from May 2018.
A. Correct.
Q. The Tribunal has seen evidence of how Qualcomm's assessment of Intel and other market players evolved over time. Would you agree that what mattered was the assessment by April 2019, not a single point

in May 2018?
A. I think that I would not be able to say April 2019, May or March or a little bit before or a little bit later, but I agree that what is important is, from a factual perspective, to look at whether Apple thought it was dependent, Qualcomm knew that Apple thought it was dependent and Apple knew that Qualcomm knew that it thought it was dependent. So, in other words, all this was common knowledge.
Q. In April 2019. That is the point I am putting to you.
A. I am not even sure why it is so important April 2019. I suppose the negotiations between Apple and Qualcomm took some time and they were debating and -- so I am happy with Apple 2019, but I am not sure exactly what is sanctified -- what is sacred about that date to tell you the truth.
Q. The point I am putting to you is that the position moved on a lot after May 2018. That is all I am saying.
A. I do not know. It may be that -- it depends on what is the point in time in which Apple felt that it needed to start acquiring chipsets or working with somebody to develop chipsets and, as I said, I did not do an analysis of documents so I do not think that I am in a position to provide an answer.
I was simply pointing out that as of 2018, Apple

seemed to believe that it was not dependent. What you are saying is that then they believe convinced that they were dependent. Fine. It is for the court to decide.
Q. I think we can move on from that point now.
Can we now look at your fifth report, please, {IRE/25/5}. This is about Apple's alternatives at the time of that decision.
A. Yes.
Q. You talk about Samsung and MediaTek as potential alternatives. I am not going to debate with you the merits of MediaTek, because that is a factual question and the Tribunal has heard from Mr Katouzian about that. I do want to talk about Samsung because that does raise some economic issues.
Can we just put this in context, please, at 261.16, which shows us 5G volumes in the market {ORI/261.16}. If we see "Shipments to all OEMs", just below halfway down the page, we can get a picture. In 2019 the volumes are tiny, but we can see that things really ramp up after that very quickly. Do you see that?
A. Yes.
Q. Actually, the take-up is very rapid if you look at the difference between 2019 and 2020. Do you see that?
A. Yes.
Q. Just to pick this up as we go through, the position

in 2019, if you look at shipments to all OEMs, MediaTek is zero in 2019 and then it comes into the market in 2020, but Qualcomm is still many, many times larger, as we saw in the other graph. Do you see that?
A. Yes, except that I disagree with the expression "it comes into the market". 2020 they made shipments. The chipsets must have been developed before. I do not think you develop a chipset in two weeks, as you said.
Q. Okay. Just focusing on Samsung, because, as I said, that is where I want to look at this. If we look at the percentage of shipments from Qualcomm to Samsung, we can see -- I mean, it is consistently -- if we look at the shipments to Samsung, can you see it is consistently 50% from 2020? Do you see that?
A. Less than 50%. I mean, it is 50% in 2020, but it becomes less over time; no?
Q. The shipments from Qualcomm?
A. So shipments --
THE CHAIR: Well, it is hovering around that.
A. Yes. That is okay.
MR WILLIAMS: Focusing on Samsung self-supply, the pattern we see is that the volumes go up, but actually the proportion of the supply is going down. Do you see that?
A. Yes, that seems correct.

Q. So, I mean, that seems to suggest that Samsung could not meet its own needs, rather than meet the needs of another major OEM, does it not, if we look at that pattern of Samsung supplying itself?
A. No, I do not think so. I think that is consistent with that explanation and it is consistent with other explanations in terms of differences in prices, differences in quality, the emergence of MediaTek, there are a number of potential explanations that are consistent with those figures.
Q. Can we look at the line shipments to all OEMs and Samsung. Can you see the numbers of shipments that it is making there?
A. Yes, I see that.
Q. You can see the most it shipped in a single year is just under 60 million. Do you see that in 2023?
A. 2023 is 58.2.
Q. That is right.
A. Of which it seems that --
Q. Can we look at the top line and look at what Apple's requirements were every year.
A. Apple needs 206.6?
Q. So Apple needs 200 million chips a year every year basically, does it not?
A. That is what it was purchasing, yes.

Q. I mean, the reality is Samsung's not a credible supplier for Apple's 5G chip needs, is it? For two reasons: first of all, the volumes are nowhere near big enough and, secondly, if Samsung could make enough of these chips, it would be using them itself rather than sell them to Apple? Is that not the reality?
A. I think that both statements are incorrect. I think that, again, you are forgetting that we are talking about market definition. The question is if Qualcomm had increased its prices, could have lost some volume, not all volume. It is only enough that it would have lost some volume to Samsung and the question then will be -- I am not sure exactly what "some volume" means but suppose there is 10%, could Samsung have moved from 58.2 to 78.2? I do not have the answer. I do not know, but that is what would need to be investigated.
Q. I was not talking about market definition but that does not matter.
Can we move on to a different topic now. In the hot-tub do you remember that there was discussion about why Qualcomm might be incentivised to put up licensing royalties rather than chipset prices and vice versa? Do you remember that discussion?
A. Yes.
Q. One of the points --

A. You wanted to ask a question about that and in end you were not allowed I think.
Q. That is right. I am going to ask you, Dr Padilla.
A. Sorry.
Q. I am glad that my line of questioning is so discrete that you cannot see where I am coming from.
So you said in your evidence that the buyer is the same on both sides of the transaction and I think you were talking about a situation where an OEM is both buying chips from Qualcomm and negotiating a royalty. In that situation, the customer is the same on both sides. That is it right, is it not?
A. I think so; no?
Q. But the royalties, the set royalties, are not only paid by Qualcomm to chipset customers, are they?
A. No, the royalties are paid by all chipset manufacturers.
Q. They are paid by --
A. Sorry, by OEMs for all the chipsets that they purchase or for all the phones that they manufacture.
Q. It is anyone who makes a device conforming to the standard?
A. Yes, that is correct.
Q. So I am going to put something to you which is again our case and then put something to you on the basis of our case to see if you agree with the logic.

So our case is that Qualcomm uses the conduct that is at issue to inflate royalties and point 2 is that that also has the effect of dragging up royalties across the market for all licensees, including those that buy chips from other manufacturers. You are aware that we make both of those points?
A. I am aware of your theory of harm, but it is -- but I do not think that -- well, ask your question.
Q. I think that is for the best, yes.
So if you accept those two points, then Qualcomm is not just going to benefit from inflated royalties paid by its own chipset customers, is it? It is going to benefit from higher royalties from customers who do not pay the chipset price. That is right, is it not?
A. Yes, but there is a fundamental problem so let me explain what the fundamental problem is with an illustration. So let us suppose that what we are saying is Qualcomm has a monopoly in LTE-CDMA, let us say, okay, but it does not want to exploit that monopoly in LTE-CDMA by charging higher chipset prices because it fears (inaudible). So it increases royalties and those royalties, according to the CR, are going to be paid by all chipset makers, except that, according to the CR itself, there are no competing CDMA-LTE chipsets. So that is the problem. The problem is that you cannot

have it both ways.
You cannot say that there are no competing chipset manufacturers and, at the same time, saying that they are going to be taxed, because they do not exist according to your theory.
Q. The simple point I am putting to you is that if royalties are inflated at the -- SEP royalties are inflated, then higher royalties are going to be paid by people who are not buying Qualcomm chips?
A. The only point I am making is that they can only be inflated if you have credible threat, that is that there are no alternatives, and therefore there are no alternative chipset manufacturers that are going to be taxed by the increased royalties.
Q. I think we are straying outside the bounds of my narrow question. I think we are going to have to move on in the interests of time.
There is an issue between you and Mr Noble about the materiality for Qualcomm of losing Apple chipset revenues. I just want to touch on that issue. Could we please look at {POF/480/3}. This is a Qualcomm internal email from mid-2014. I do not know whether you had ever seen this before it was notified to you?
A. No, I had not seen it before.
Q. Could you read the paragraph in the middle that says:

"Apple. The biggest upside ..."
(Pause)
A. I have read it.
Q. So in this email, Jim Thompson, he is writing to Steve Mollenkopf, who is now the CEO, and Jim Thompson, I believe, is either head of engineering or chief technical officer. He is in a technical role. He says that he knows Apple wants to bring in Intel because of the licensing issue. Do you see that?
A. That's what he says, yes.
Q. It looks like they are talking about Apple's concerns about the level of the royalty. That is what is look like from the context; do you agree?
A. That seems to be the discussion and Apple has been opposing all royalties from all licensors over the years so I am not surprised that they thought so.
Q. What this email says is that Qualcomm is not going to give way on the licensing issue and in fact they are going to take a harder line. Do you agree that is what the email says?
A. Yes.
Q. Now, the issue that you focus on, and which has come into focus in this debate with you and Mr Noble, is the materiality of the loss of chipset revenue, but do you agree that Qualcomm did not look at that in isolation?

We can see that from this email. It is trading off the effect of this dispute on chipset revenues and the effect on its licensing revenues. Do you agree with that?
A. I think that you are reading too much into that sentence. I am not able to take a position.
Q. I mean, we know that Qualcomm was prepared to let Apple walk away as a chipset customer, rather than make any concession on the royalty. We know that much, do we not?
A. Well, we know that this engineer, who I had never encountered before, who may be very important or not very important -- it is for the court to determine -- has an opinion.
Q. I mean, can I put this to you and see whether you can answer it: I mean, looking at this email, if Qualcomm had been seriously concerned about losing chipset revenues, then it could have made concessions on the licensing disagreement with Apple, could it not? That would be one way of saving the chipset revenues.
A. Again, I am not sure that I understand that they think that in equilibrium they are going to lose anything and this is the opinion of the engineer.
Look, I am not able to provide you with corroborating or I am not able to say that this supports

or criticises anything. It is an opinion and I do not know in which context, what was the response, what were the questions that were considering.
Q. Can I ask you this: would you agree that in thinking about Qualcomm's incentives in this situation, whether to let Apple walk away, we cannot just look at the loss of chipset revenues in isolation, we have to look at its incentives on the licensing side too, because that is what Qualcomm seems to be doing?
A. That is what this engineer believes and I can understand the logic because it is the single -- it is the single customer, as we are saying. They are buying both things. So I think that, yes.
Q. I am going to now move on to leveraging. Can we look at {EAOE/12/6}. Can we read, please, paragraph 2.1 and then 2.2. (Pause)
A. Excuse me, I lost track. Paragraph 2.1 and 2.2 in?
Q. In your third report.
A. Yes.
Q. Do you see footnote 8? Can you see that cross-refers to the Class Representative's reply?
A. Qualcomm's defence, 20 -- yes.
Q. Yes. Paragraph 25(c). So can we then look at that, please, at {ORA/3/17}. Just read subparagraph (c) to yourself. (Pause)

A. Okay.
Q. So that paragraph is just saying that the sums that Qualcomm charges do not reflect a fair return, but they reflect its market power. Is it not saying that every OEM was charged a sum that was proportionate to Qualcomm's market power. It does not say that, does it?
A. You are questioning the footnote?
Q. I am questioning the paragraph of the pleading which you say forms the basis of the Qualcomm -- of the Class Representative's theory of harm and which you say leads you to conclude that the -- that on the Class Representative's theory of harm royalties would be in proportion to an OEM's dependence on Qualcomm. I am just saying the premise for that understanding is just incorrect, it is a misreading of this paragraph, is it not?
A. Let me consider again because you may understand I do not remember this footnote and this paragraph so let me read it again. There are months distance from there to here.
Q. Does this paragraph of the reply, as you read it now, say that royalties would be expected to be proportionate to an OEM's dependence on Qualcomm?
A. Sorry, my reading now that I have read it again, it confirms my interpretation. You are saying -- the

paragraph in question says that the NLNC policy inherently involves Qualcomm charging licensing sums that reflect Qualcomm's market power in the supply of chipsets. So it has to be related to the supply of chipsets. If you take my OEM-specific market definitions, it would be the supply of chipsets to Apple and the supply of chipsets to Samsung.
If you take Mr Noble's broad market definition, then what the -- it is alleged is that Qualcomm is leveraging its market power in the supply of chipsets on to royalties.
Q. But not --
A. With all due respect --
Q. But not in proportion to an individual OEM's dependence on Qualcomm. That is the only point I am putting to you.
A. But the leveraging analysis looks at dependency OEM by OEM, but it also has a robustness test in which we are looking at the position of Qualcomm in chipset markets more broadly. So it is testing this proposition under the market definition proposed by Mr Noble and under my market definitions. When you are saying "in proportion", I think that there is something that I need to clarify.
The leveraging analysis does not say that a 10%

increase in dependency translates into a 10% higher royalty. It does not impose a linear relationship or a non-linear relationship or whatever form of relationship. It simply says that if Qualcomm is stronger in chipsets, it should be able, according to the theory of harm, to extract higher rents in royalties, in whatever proportion or relationship.
Q. We saw paragraph 2.2, but we will deal with that in submissions later on.
Can we look at Mr Noble's ninth report {EAOE/17/8}. You are familiar with this. It is Mr Noble's ninth report.
A. I have read it in due course, yes. I have not memorised it either so I will follow you.
Q. 2.6, 2.8, 2.9, they set out a whole range of factors that affect royalties which may differ across OEMs and they are mostly taken from Mr Melin who is Qualcomm's industry expert. As far as you are aware, is there any disagreement about the point that Mr Melin identifies?
A. As far as I am aware.
Q. Mr Melin identifies all of these factors --
A. No, I have no disagreement. I agree with those factors.
Q. So if the chipset royalty is affected by all of these different factors and the effect of NLNC is to push the rate up from where it would otherwise be, you would not

expect to see a straight-line relationship between dependence and royalties, would you? You would just expect to see that royalty is higher than it would be in the counterfactual for any OEM. Do you accept that?
A. I never said that there has to be a linear relationship. All that I said is that according to your theory of harm, there is one particular factor that is very relevant, which is chipset market power and that that has to be reflected in the data and it is not, but I never postulated a linear relationship and I would agree with you there is not necessarily a linear relationship. It could be exponential, logarithmic, hyperbolic, cubic.
Q. But --
A. Quadratic.
Q. I'll keep going with that line of analysis, I mean, if royalty rates are not in proportion to dependence, then you do not learn anything about the Class Representative's case from the level of the royalty paid by Apple and Samsung relative to what other OEMs paid, do you? They may have paid lower royalties than others did both with and without the conduct. Do you agree with that?
A. I am not sure that I understand the question. Could you repeat it, sorry?

Q. One of the points you make is that Apple and Samsung paid lower royalties than others.
A. Yes.
Q. If the theory of harm is simply that the conduct inflated the level of royalty above that in a counterfactual --
A. That is confidential.
Q. I was not going -- I was going to go into numbers in confidential.
MR WILLIAMS: I am just wondering, Madam, whether I go into closed session now.
THE CHAIR: All right. Let us do that.
(3.56 pm)

In Private

(3.56 pm)
THE CHAIR: Which level of closed session do you want to go into?
MR WILLIAMS: 1782 at first, Madam.
THE CHAIR: Is that 1782 external or internal?
MR WILLIAMS: Not external yet, no. I am going to get to external briefly.
THE CHAIR: So is that 1782 in -- there are several levels of 1782. 1782 in-house counsel, is that what you are going to?
MR WILLIAMS: In sorry, Madam, I have slightly gone out of

my sequence now.
THE CHAIR: It is all right. I am just trying to work out what level of confidential ring we are in.
MR WILLIAMS: I was going to in-house counsel at this stage.
THE CHAIR: In-house counsel.
MR WILLIAMS: I will get to the external eyes only at some point.
THE CHAIR: All right.
MR WILLIAMS: If Apple and Samsung pay lower royalties than other OEMs, and the theory of harm is simply that they pay higher royalties than they would have paid in the counterfactual, the fact that they pay those royalties that -- those lower royalties does not tell you anything about whether they suffered an overcharge, does it? They may well have suffered -- paid lower rates with and without the infringing conduct?
A. That is correct and I think that I was not referring to the level of royalties as evidence contrary to that aspect of the theory of harm. Having said so given the importance that the indirect effect has taken during these discussions, yes, the fact that they pay -- they pay significantly lower undermines the indirect effect that has been so much emphasised by Mr Noble in these sessions.
Q. So I am now going to go back, Madam, to an issue we

covered earlier on, which was the ability of Qualcomm to discipline Apple in relation to 3G CDMA.
Can we please look at {POF/223}, which I think is tab 11 in the hard-copy bundle. Can we please look at page 5 {POF/223/5}. Can you read point 6, please. Now, it is quite factually dense this, but the point I am going to put to you is based on the last paragraph. (Pause).
THE CHAIR: Can you just provide a little bit of context.
MR WILLIAMS: I am so sorry, Madam. This is an internal Apple email, dating from 2010, and it is discussing here what we have called the "CDMA adder" in the context of this paragraph. It is Apple considering its chipset supply options.
A. Mm-hmm.
Q. The only point I wanted to put to you: we talked about how to interpret the evidential position in relation to substitutability between UMTS and CDMA. It looks from this last paragraph as though Apple thought it had absolutely no ability to discipline Qualcomm's pricing of CDMA. It says:
"The odds of this happening are zero ... textbook monopolist pricing ..."
This is inconsistent with the idea that Apple though it had any ability to discipline Qualcomm CDMA pricing,

is it not?
A. So this email indeed would suggest that there is no —— that this —— whoever wrote this and in the context that wrote this consider that Qualcomm could extract monopoly prices for CDMA chipsets. It is interesting to think about the relevance of this for the CR's theory of harm, because it basically means that there is —— that all rents were extracted with the chipset, which means that there was no need to leverage onto royalties and given that there is disagreement among economists that there is only one monopoly rent, that would suggest that according to Apple that was it.
Q. On the point I asked you about in terms of Apple's ability to discipline Qualcomm, we agree that this appears to suggest Apple did not think it had any ability to discipline Qualcomm's CDMA pricing?
A. This is what this individual, whoever he is, in the context of the conversation, thought. All that I am saying is that under the theory —— the CR theory of harm, this 5% —— this $5 adder cannot be a monopoly —— cannot reflect monopoly pricing chipset, because there is then the theory of harm would collapse because the theory of harm says that those rents, those monopoly rents, are extracted through royalties, not through chipset prices. Again, one cannot have it both ways.

Q. While we are in closed session, I just want to go back to the leveraging analysis. We are now going to go into external advisers only. (Pause)
Can we look at {EAOE/12/16}, please. So this is a graph and you say that this shows that Apple's rates did not move in line with its dependence on Qualcomm. You say that undermines the theory of harm?
A. Correct.
Q. So I am going to put a different hypothesis to you about how we read this graph. I am going to have to ask you bear with me while I put a number of propositions to you and then you can respond, if that is all right?
A. That is okay.
Q. There are five points.
So point 1 is Qualcomm gave Apple rebates against the royalty rate in 2007, you are familiar with that, before Apple was buying any chips, but it did that for its own commercial reasons because it secured terms which made it unlikely that Apple would use a rival technology. So that is point 1.
Apple is not buying any chips but Qualcomm has commercial reasons to give them a discount.
Point 2 is that by 2009, Apple had decided to launch on CDMA networks. It needed Qualcomm chips. It wanted to renegotiate the royalty rate, but it could not

because it feared disruption to chipset supply which it was then receiving from Qualcomm. So that is point 2.
Point 3 is that Apple remained dependent on Qualcomm until 2015/2016.
Point 4 is that it was not dependent on Qualcomm 2016 to 2018 and in that period it litigated with Qualcomm but did not get a reduction in the rate.
Point 5, as you know, is that by 2019 it was dependent on Qualcomm again. It negotiated a new licence and a settlement and it was all effectively at the old rate.
So thank you for your patience. I mean, if what I have just set out are the facts, that graph is consistent with those facts, is it not?
A. That is for the court, frankly. I think that I was trying to listen attentively, but I think that there have been lots of fact I would need to digest. I do not think that this alternative explanation was presented by Mr Noble in his response and I have the opportunity to consider it so I do not think that I can —— I am in a position to provide a response now. There are lots of factual issues that you raised that the court would have to determine.
I understand that what you are basically saying is that you agree with the points that I draw in terms of

the affected ad valorems. Whether you are prepared to look at is this, that you agree with the dependency calculation and that you have a different narrative. It is for the court. I am sorry. I would have liked to help but I am not in a position to.
MR WILLIAMS: You have responded. That is for you to respond.
While we are looking at the graph, there is a point of detail. We can see that the settlement is at roughly the same rate as the licences. We can see that, can we not?
A. Sorry, say it again?
Q. The settlement in 2019, which is the back royalties, that is at roughly the same level as the licences?
A. Correct.
Q. Can we look at page 10 of this report, please, and specifically footnote 23 on page —— sorry, it is paragraph 2.8(d) and footnote 23 on page 10 {EAOE/12/10}. What you say in the footnote, as I understand it, is that the figures you derive for the settlement are very similar to the licence rate and so that makes you think it is a reliable calculation of the back royalties. Is that right?
A. Correct.
Q. The reason you expect them to be similar, I assume, is

that if Apple agrees to pay a royalty under a licence, it is going to expect to pay something comparable under a settlement. That is the logic, is it? It is going to expect to have to pay the same rate going backwards roughly or something comparable?
A. What I expected is that they would pay no more than they would have instructed the CMs not to pay. So, I mean, here there is an anchor that does not exist in other situations where you do not know exactly what would be the rates for past sales. Here this settlement concerns the fact that during a period of months, Apple had instructed the CMs not to pay and now it was compensating Qualcomm for the amounts not paid. All that I am saying is that the amount that I calculated was in a sense commensurate with what the CMs had not paid which seems to suggest that calculation was correct.
Q. Yes. But I think the logic is you would expect to see some level of similarity in the numbers and that gives you comfort ——
A. There, yes, for that particular instance and because of the settlement and it is not similar across situations, it is not settlement with before or after; it is with the amounts not paid.
Q. Yes, I understand.

I think that is everything I needed to do in confidential, madame. I just have a few more points in open.
THE CHAIR: All right. So we will go back to ——
MR WILLIAMS: I do not know if I could ask for the same clarity from my learned friend as to how long he thinks he might need in re—ex so that I can cross—examine until ——
MR JOWELL: At the moment, I just have one question.
THE CHAIR: All right.
MR WILLIAMS: 25 past at the moment.
THE CHAIR: 25 past.
MR WILLIAMS: I am grateful, Madam. Back in open.
(4.08 pm)
In Open Court
(4.08 pm)
MR WILLIAMS: In your leveraging analysis you have two control groups. One of them is contract manufacturers and you explained last week that they were less affected by NLNC, because they generally sell to licensed OEMs and I think you said they are not unlikely to have foreseen a situation where they sell to an unlicensed OEM that depends on Qualcomm?
A. I do not know whether they were able or unable. All I am saying is that their contracts were signed so early

that it is difficult to believe that they were anticipating what would be the position of Qualcomm in 2019, for example, given that the agreements were 2004.
Q. Yes. So can we just unpack that a little bit. Can we please bring up {POF/95}, which is an example of one of the CM licences. This is with Foxconn, I think. Can we turn on to page 10 {POF/95/10}. This is outer ring confidential so I will not read anything out, but if you just read clause 5.1, which runs from page 11 —— 10 on to page 11 {POF/95/10—11}.
A. Sorry, it moved and I lost it. Which paragraph is it?
Q. I think it is in your hard—copy bundle. It is not. It is clause 5.1.
A. 5.1. Okay.
Q. So you can see ——
A. I am reading. I am reading. (Pause)
Actually it is a long paragraph. Do you want to point me to a particular sentence or sentences?
Q. So you can stop at the words "unlicensed customers" about five lines down on page 11.
A. Okay, let me read. (Pause)
Q. Do you see that?
A. I am reading.
Q. We can see that this licence only applies where it is actually needed. Do you see that?

A. I have not finished reading.
Q. I am sorry. I thought you said you had.
A. I am slow. (Pause)
Yes. So what is the point you want to make because, you know, I am reading but maybe I am missing something.
Q. I think the point you raised was most of the time CMs do not need a licence because most of the OEMs were licensed?
A. Yes.
Q. This licence is dealing —— it is specifically designed to cater for the opposite situation. That is the only point I am making to you. So this is a situation where the licence is needed.
A. So this is a situation and that is why I said that it is less needed, not absolutely needed —— not needed.
Q. I understand. One of the contract manufacturers we are interested is in Pegatron. You are aware of them. They were one of the suppliers to Apple?
A. Yes.
Q. They took a licence —— well, I will not say the date, but I do not think it is confidential, but —— maybe we can just look at the evidence I wanted to look at. It is {POD/7/32}. You can see there is evidence from Monica Yang of Pegatron. This is not confidential.
A. This is the date of the Pegatron ——

Q. The passage that starts with 244. If you can just read --
A. Paragraph starts at?
Q. It is -- do you see there is a first passage number 226 and a second passage number 244? Do you see that?
A. Now I see it, yes.
Q. Could you just read the section starting 244. (Pause)
A. Right. I can see that.
Q. So on the case, as the Class Representative puts it, this is a simple no licence, no chips, is it not? They are a contract manufacturer, but they needed the chips for their business and they are affected in just the same way as an OEM is, are they not?
A. That is what he is claiming, yes.
Q. So it does not matter whether this licence was entered into to serve Apple or anyone else, does it, because the contract manufacturers needed the licence in order to buy the chips to make the phone for an unlicensed customer?
A. I think that is for the court to decide. I think that this is the statement from this gentleman in this Q&A prepared I do not know when in response to I do not know what and I don't know how much you can generalise. I suppose that there would be different positions between the two parties and the court will have to

decide. I am afraid I cannot help.
Q. So that is your first control and the point I have been putting to you is that they are not a group that does not need a license. They need a licence for the reasons we have just been looking at.
Your other control is explained at {EAOE/12/6}. Do you see (k)?
A. No.
Q. So that is your other control group and you say this is OEMs that have not purchased before from Qualcomm.
A. Right.
Q. So they could not have been dependent on Qualcomm?
A. Yes, now I can see it. It is at the top.
Q. I will not say the names out loud because they are marked as confidential. Now, I think it is right to say that the last two suppliers that are named were new entrants at the time they obtained their licences, although I am not sure there is any evidence about that. I mean, once they had entered market, they did have to buy chips from somebody or they could not make any phones. Presumably you agree with that?
A. Presumably. More than presumably, I agree with that.
Q. We can see the dates of the licenses there?
A. Yes.
Q. This is the 3G era, is it not?

A. This is 3G, yes.
Q. You can see the manufacturers. I do not know how familiar you are with them, but each of them is from a country where CDMA is used. Do you see that?
A. Where CDMA is used, but also UMTS is used.
Q. Yes, but CDMA was used in the countries where they are from. Do you --
A. Yes.
Q. So it is a fair assumption, is it not, that they needed 3G CDMA chips to make phones for their home markets, is it not?
A. I doubt it because they never bought; no? I think that the whole purpose of this is to look at -- to look at licensees that never purchased.
Q. Never previously purchased, never purchased before they are licensed I thought was the point?
A. Oh, so you are saying that they were dependent -- they would be dependent in the future?
Q. I am saying that at around the time that they entered into these licences, they very probably needed 3G CDMA chips to make phones for their home markets?
A. I do not know.
Q. You have not looked into that?
A. I have -- I do not recall having looked into that, no.
Q. But if they did need those chips, then they needed

a licence, did they not?
A. If they wanted to sell those chips, phones on those chips, they would need a licence.
(Pause)
Q. The last few questions are about the NDRC. Now, you say that the NDRC rate is a potential counterfactual benchmark, do you not?
A. Yes.
Q. If we could look at that in the JES {POE/24/45}. Can you look at 78.2 there.
A. Yes.
Q. So, if I understand your logic here, it is that the NLNC resolution was not -- sorry, NDRC resolution was not itself affected by the conduct at issue. Have I read that correctly?
I am sorry if I am squinting at you. I am now looking straight at the sun, Dr Padilla, so it is about the sun, rather than anything you are saying.
A. Could you repeat the question, please?
Q. So I think your logic in this paragraph is that the NDRC resolution is not itself affected by the conduct at issue, so therefore you are saying it is a potential competitive benchmark?
A. So precisely what I am saying is that the royalty rates that resulted from the NDRC resolution cannot be

affected by the NLNC policy.
Q. Yes. So can we just look at what Mr Noble says about this in the JES at 77.1, please. This is on page 44, the previous page {POE/24/44}. What Mr Noble says here is that he has not seen evidence that the NDRC resolution brought the rate to a competitive level. That is all he is saying, is it not? Do you accept that?
A. Yes, and I think that what my interpretation of this is that the NDRC rates proxy those that would emerge in the counterfactual as defined by Mr Moser the other day, that is not in the inner bilateral negotiation resulting from, you know, which chipset dependency by third party decision-maker.
Q. Right. But you have not presented any evidence that the NDRC rate is itself fair value; it is just what the NDRC accepted as an overall cap as it applies to every OEM in the market. That is right, is it not?
A. It is a third party decision-maker which is not affected by any degree of dependency --
Q. But it is not --
A. -- from chipsets or from anything else and therefore it is a good proxy of what an efficient decision-maker in the counterfactual would decide.
Q. It is an overall cap for all OEMs. It is not the same

thing as a party going to court and seeking a determination of a FRAND rate as it applies to them, is it? It is not that?
A. Well, according to the indirect effect theory of Mr Noble, one thing and the other are exactly the same, but, leaving that aside, no, it is not the same, but it is a good proxy is all that I am saying.
Q. Can we look at the joint expert statement on page 53, please {POE/24/53}. At point 86, I am not going to read this out, but Mr Noble presents other evidence that the Qualcomm rate is inflated and he says this is a good proxy. Do you see in point 86, that is another proxy; yes?
A. Yes, I see that, and --
Q. If one thinks about the way that FRAND litigation works, that is exactly the sort of evidence that would be considered in FRAND litigation. Do you agree?
A. This is one of the things that would be looked at, although, in my experience, and I believe consistently with the latest ruling in Optis v Apple, you tend to focus on the same portfolio, not in the portfolio of another company.
Q. Right. The only point I am putting to you, Dr Padilla, is that either we look at all of the evidence about what might be a competitive benchmark or we look at none of

it. We cannot look at the NDRC resolution and say: well, that is a competitive benchmark but we are not going to look at that competitive benchmark. These are all matters for trial 2, are they not; they are all matters for another stage of the litigation?
A. Look, again, this 86 was a bit surprising to me, to tell you the truth, because it seems to me that belongs to if we were in a second trial. On the basis of the evidence that I had, and I think that Mr Noble does not disagree with that, the NDRC rate is not affected by NLNC.
Again, I do not know exactly now whether FRAND is the relevant counterfactual in your mind or not, but NDRC is not affected by NLNC. It seems to me that it provided a good framework for the leveraging analysis in the context of the first trial.
Q. I mean, you are a very experienced competition economist, Dr Padilla. In your experience, when the regulator -- the Competition Authority looks at a problem, do they always -- and they impose remedies, do they always go far enough to impose an appropriate remedy for every party in the market?
A. I think that, look, they -- I am pretty sure that the Chinese Government and, in this particular instance, the agency, the NDRC, was trying to make sure that the companies directly in which it held a direct interest in

the Chinese companies, were paying something that was fair, reasonable and non-discriminatory.
I think what happened is that later on, in 2018, Qualcomm extended the same terms and conditions to everybody else, not only in China.
So, yes, I think that I am pretty sure that the Chinese were really looking to get the best possible deal.
Q. Can I just deal with one more issue, which is whether the NDRC's decision implies that Qualcomm's previous rates were too high. That is on page 45 of the joint statement {POE/24/45}. It is paragraph 78.3. The point you make is that you can have a FRAND rate and voluntarily charge less.
So are you saying that the NDRC thought that the prior rate was FRAND and that Qualcomm was now voluntarily charging less than the prior FRAND rate? Is that what you are saying the NDRC thought?
A. So could you repeat the question?
Q. Well, I am just asking you what paragraph 78.3 means because --
A. Let me just read it.
Q. -- this is dealing with the question of whether the NDRC's decision implies that the prior rates were too high and I do not understand what you are saying in

paragraph 78.3. I mean, are you saying that the NDRC thought that the prior rate was FRAND, or may have thought that, and that all Qualcomm was doing under that resolution was voluntarily reducing prices within a FRAND range? Is that what you are saying happened under that remedy?
A. I think that all that I am saying there is that from the commitment achieved or the commitment entered into, you cannot infer that the rates before were excessive or not FRAND.
Q. Right. But I am focusing on what the NDRC thought. I mean, do you accept that the NDRC must have thought that the prior rates were too high?
A. The NDRC wanted lower?
Q. Yes.
A. Yes, I am prepared to accept that.
MR WILLIAMS: Madam, that is the end of my cross-examination.

Re-examination by MR JOWELL

MR JOWELL: Dr Padilla, it probably seems quite a long time ago, but towards the beginning of your cross-examination -- it is [draft] page 107, lines 17 to 23 -- you were asked, in summary, about the ability of OEMs to shift their purchases or some of their purchases as between CDMA and UMTS and you recall that it was

suggested that that was not contained in your reports. If I could ask you to go, please, to 289 of your fourth report, which is {POE/22/92}.
A. Which paragraph?
Q. 289. Could I invite you to read that paragraph and then make any additional comments you wish to make. (Pause)
A. Well, it seems that I consider switching from CDMA to UMTS in my report, but my memory is imperfect.
MR JOWELL: Thank you. I have no further questions.
THE CHAIR: Thank you very much, Dr Padilla. That concludes your evidence.
That concludes the evidence in the case, as I understand.

Housekeeping

MR JOWELL: Ma'am, it does.
One small point on skeleton arguments, which are currently due for Monday --
THE CHAIR: Closing submissions.
MR JOWELL: Forgive me, closing submissions. The parties have a joint request, of which I am the mouthpiece, which is that they should be allowed to produce the closing submissions in an unredacted form in the morning and provide the confidential versions by close of business.
THE CHAIR: Yes.

MR JOWELL: If that is convenient to the Tribunal?
THE CHAIR: That seems sensible.
MR JOWELL: I am grateful.
THE CHAIR: We are still working to 120 pages?
MR JOWELL: We are.
THE CHAIR: Formatting agreed with a table of contents.
MR JOWELL: Yes, indeed.
THE CHAIR: Please.
MR TURNER: One area that has just confused me a little bit, and it may be my fault, but you have -- Qualcomm have a section on extraterritoriality in the skeleton and in that you raise the fact that the agreements are governed by Californian law and that the leveraging of dominance took place outside the UK and that we should have regard to the position in the US and Korea. You mention that, but there are potentially other questions of applicable law which might or might not arise and it is just really to understand, when you get to your closing, where we are on those.
We have had a discussion that FRAND requires a willing licensee and a willing licensor, FRAND negotiations, and we have talked about the UK authorities in relation to that. We have not however been addressed, I do not think, on whether the same principles apply in other jurisdictions, either whether

that matters or whether we are working on the basis that we assume the law in those other jurisdictions is the same because no party has raised an alternative. That was one area.
So just clarity on whether we have to -- how we are dealing with that.
The second thing was there has been quite a lot of discussion in the evidence and also in oral evidence about exhaustion of patent rights in the US. We have not been addressed -- we have also been told that there was a developing area of law over the relevant period. We have not been addressed on what the US law is, was, how it developed and it may be that we do not need to be addressed on that, but, again, just if you could consider whether we need to worry about it or not or whether we just accept -- it is common ground we just accept what the witnesses say on that.
MR JOWELL: Yes, indeed, we will. You are not, I assume, asking for a response now but something to bear in mind?
MR TURNER: No, just bear those in mind for the written closing submissions.
MR JOWELL: Yes, indeed.
THE CHAIR: Just going back on your request, Mr Jowell: close of business, could that be 4 o'clock?
MR JOWELL: It will be 4 o'clock.

THE CHAIR: All right. Just because of when the court staff leave.

Also your redacted versions, just because you know that we have had problems reading some of the redacted -- some of the sections that are redacted, please can all the redactions be in a pale colour so that we can actually read the text because we obviously have not replaced everything that is in our core bundles, but on the original versions it was just not possible to read properly under the redactions.

MR JOWELL: We hear you loud and clear and respectfully agree.

THE CHAIR: Yes. Thank you.

MR WILLIAMS: In the interests of avoiding any further misunderstandings about formatting, Madam, when you refer to a table of contents, is that outside the allowance for pages?

THE CHAIR: All right, yes.

MR WILLIAMS: I am grateful.

THE CHAIR: Are there any other questions?

MR WILLIAMS: I cannot see there will not be any more questions when we start formatting the document, Madam, but I do not have any at the moment.

THE CHAIR: Well, if you do have questions, you can send them to the court. Thank you very much.

(4.31 pm)

(The court adjourned until Friday, 31 October 2025)

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