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**IN THE COMPETITION**

Case No. : 1382/7/7/21

**APPEAL**  
**TRIBUNAL**

Salisbury Square House  
8 Salisbury Square  
London EC4Y 8AP

Monday 6<sup>th</sup> October 2025 – Tuesday 4<sup>th</sup> 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**

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**A P P E A R A N C E S**

PHILIP MOSER KC, ROB WILLIAMS KC, MICHAEL ARMITAGE, CIAR MCANDREW, DANIEL ALEXANDER KC, DAVID IVISON and CHARLOTTE MCLEAN (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

1 Wednesday, 15 October 2025  
 2 (10.30 am)  
 3 Housekeeping  
 4 THE CHAIR: Yes, Mr Saunders.  
 5 MR SAUNDERS: My Lady, I can address you very briefly about  
 6 the question that you had in yesterday's proceedings  
 7 relating to the licensed patents point, if I may?  
 8 THE CHAIR: Yes.  
 9 MR SAUNDERS: Then we have, obviously, the hot-tub to  
 10 follow.  
 11 THE CHAIR: Yes.  
 12 MR SAUNDERS: So, as you observed yesterday, Mr Gonell made  
 13 a distinction in his evidence between licensed products  
 14 and licensed patents. The relevant section of the  
 15 evidence is {Day5/138-139} of the transcript. That was  
 16 in private, I think, but this particular point is --  
 17 I will not go back into the prelude to it, but this  
 18 particular point is not something that needs to be in  
 19 private.  
 20 It was put to him that Apple did not need -- did  
 21 need a new licence for 5G in 2019, the CM licence would  
 22 not work and Mr Gonell said:  
 23 "No, that is not true. The CM licence would have  
 24 worked for their purposes just fine."  
 25 "Question: That is simply not right, is it, after

1

1 everything we have just discussed?"  
 2 His answer was:  
 3 "No, I think you are missing the distinction between  
 4 licenced patents and licenced products. Were multi-mode  
 5 5G-enabled phones, that included CDMA, licensed products  
 6 under those agreements? Yes. Unquestionably yes. I do  
 7 not see how anyone could dispute it and so could --  
 8 would we have sold chipsets to them? Would we have  
 9 checked the box that says 'yes, they are licensed for  
 10 using those chipsets in those products', yes."  
 11 Then it was put:  
 12 "5G SEPs were not licensed patents, were they, under  
 13 those agreements?"  
 14 The answer was:  
 15 "If they were beyond the capture date, then they  
 16 were not licensed patents, but that by itself did not  
 17 affect the supply of chips or the ability to get chips  
 18 that had 5G."  
 19 THE CHAIR: That was the section that I was referring to.  
 20 MR SAUNDERS: That is the distinction.  
 21 So the way that Qualcomm's licence agreements work,  
 22 and also many others in this industry, is that they  
 23 define certain licensed products and those are the ones  
 24 on which a royalty is due and they also provide rights  
 25 to make and sell those licensed products. One of the

2

1 licences we looked at with Mr Gonell defined a licensed  
 2 product as a handset which is capable of working to the  
 3 CDMA air interface. That means products which worked on  
 4 CDMA 3G and UMTS.  
 5 So those are licensed products, if they are capable  
 6 of doing that. All phones that practise CDMA standards  
 7 are licensed products under that agreement, regardless  
 8 of whether they also practise some other standards.  
 9 So it is the CDMA that triggers whether or not you  
 10 are a licensed product within the scope of that  
 11 agreement.  
 12 The important point for present purposes, and what  
 13 Mr Gonell explained in his evidence, is that under  
 14 Qualcomm's chipset supply practice, Qualcomm will sell  
 15 chipsets for use in licensed products regardless of what  
 16 the scope of the licensed patents might be. So the  
 17 licence we were looking at provided rights to make and  
 18 sell multi-mode handsets, so 4G multi-mode handsets,  
 19 which were LTE and they also had 3G, which is a CDMA  
 20 standard through UMTS or CDMA2000 and so they are  
 21 covered.  
 22 THE CHAIR: So, put shortly, at the point at which 5G -- the  
 23 5G standards were introduced, if you had a phone,  
 24 a handset which had a 5G chip in it which was backwards  
 25 compatible with the 3G either CDMA --

3

1 MR SAUNDERS: Yes, a multi-mode product that had -- that  
 2 practised 3G, that is a licensed product, therefore it  
 3 is covered.  
 4 If you sell, for example, a 5G-only device, then you  
 5 are outwith the --  
 6 THE CHAIR: When you say "multi-mode", are you using that to  
 7 encompass something which had -- which was 5G but also  
 8 backwards compatible with LTE and one or other form of  
 9 3G?  
 10 MR SAUNDERS: Exactly. So that is the usual -- so there are  
 11 no products -- Apple did not sell any single-mode 4G or  
 12 5G phones. They are always backwards compatible and  
 13 include some flavour of CDMA.  
 14 THE CHAIR: Some flavour of CDMA, exactly. So if you have  
 15 a phone which is a -- which is a 5G/4G and then some  
 16 flavour of 3G, your position is that it was not  
 17 necessary for there to be a new licence agreement for  
 18 those products, because those products were covered by  
 19 the existing licence --  
 20 MR SAUNDERS: Because they were licensed products.  
 21 THE CHAIR: -- because they were licensed products. What  
 22 would have been necessary would have been if there was  
 23 a handset that was only 5G --  
 24 MR SAUNDERS: Yes.  
 25 THE CHAIR: -- a pure 5G that did not have some flavour of

4

1 3G or 4G, for that matter, and, in that case, a separate  
 2 licence would have been required.  
 3 MR SAUNDERS: Yes, because there is no — they are not  
 4 within the scope of the definition of "licensed  
 5 products".  
 6 THE CHAIR: All right.  
 7 MR SAUNDERS: I think as, Madam, you picked up, we did not  
 8 think there was a particular dispute about this, because  
 9 in paragraph 11 of my learned friend's note on  
 10 Wednesday, they averred that prior to 2019 Apple was  
 11 licensed via its CMs.  
 12 THE CHAIR: Yes.  
 13 MR SAUNDERS: So it seems that — perhaps during — someone  
 14 came up with the idea in cross-examination of making  
 15 some kind of distinction with 5G, but if you think about  
 16 it the same point — the same construction and the same  
 17 point runs for 5G, 6G, 7G, whatever. The question  
 18 is: does it have CDMA?  
 19 THE CHAIR: So the reason why Apple was licensed in respect  
 20 of 4G through its CMs was that the 3G licences covered  
 21 a multi-mode phone or backward compatible phone which  
 22 was 4G and some flavour of 3G?  
 23 MR SAUNDERS: That is the point.  
 24 THE CHAIR: All right. That was our understanding of  
 25 Mr Gonell's evidence, but we wanted to just check that

5

1 we had understood that section of the transcript  
 2 correctly. That is what you say is the interpretation  
 3 of what he said.  
 4 Obviously if the Class Representative takes  
 5 a different view as to how we should understand that  
 6 part of his evidence, they will make submissions on that  
 7 in due course.  
 8 MR SAUNDERS: Yes, although at the same time it would help  
 9 if — because they have already telegraphed this seems  
 10 to be common ground.  
 11 THE CHAIR: As regards 4G.  
 12 MR SAUNDERS: So, if it is no longer common ground, it would  
 13 be helpful to know that that is something we have to  
 14 deal with and also it may be illegitimate for them to  
 15 change tack on that, but let us not debate that now.  
 16 THE CHAIR: Thank you for that helpful clarification.  
 17 Mr Moser or Mr Williams, is there anything that  
 18 either of you want to say about that?  
 19 MR WILLIAMS: No, Madam. There is nothing I want to say  
 20 about it. I think from our point of view it is a matter  
 21 for submissions in due course. I hope in the course of  
 22 the cross-examination the Tribunal understood the points  
 23 that we were putting to the witness about the way in  
 24 which the position had been understood between the  
 25 parties historically and about, I think, precisely as

6

1 Mr Saunders says, the distinction between the scope of  
 2 the licensed product and the scope of the licensed  
 3 patents and the point that we were seeking to get at in  
 4 cross-examination was about the scope in respect of the  
 5 licensed patents and the short point is — or the short  
 6 point we were getting at is that if Apple wanted to  
 7 implement 5G using 5G chips, it needed to be licensed in  
 8 respect of 5G SEPs and so that is the point that we were  
 9 getting at in cross-examination.  
 10 THE CHAIR: Well, no, the response to that from Mr Gonell  
 11 was there is a distinction between licensed products and  
 12 licensed patents with the — and our understanding of  
 13 that was as Mr Saunders has confirmed is also Qualcomm's  
 14 understanding of his evidence.  
 15 MR WILLIAMS: We understand that was his evidence. I think  
 16 where one goes beyond that is a matter of submission,  
 17 Madam.  
 18 THE CHAIR: Yes, but just to note that Mr Moser did not push  
 19 back at Mr Gonell when he said that point.  
 20 MR WILLIAMS: No, the point we were getting at was related  
 21 to the scope of the patent in respect of — sorry, the  
 22 licence in respect of patents, not the scope of the  
 23 licence in respect of products.  
 24 THE CHAIR: When Mr Gonell made the point about the  
 25 distinction, it was not suggested to him that that

7

1 distinction was an invalid one.  
 2 MR WILLIAMS: No, any submissions we make in due course will  
 3 not be calling that into question.  
 4 THE CHAIR: No.  
 5 MR WILLIAMS: They will be about the significance of whether  
 6 Apple was licensed in respect of 5G SEPs.  
 7 THE CHAIR: Yes, all right. Thank you very much.  
 8 MR SAUNDERS: My Lady, just hearing that submission, there  
 9 is one other point. Of course these are foreign law  
 10 agreements under which different rules of interpretation  
 11 apply, in particular I think in California they have  
 12 slightly more emphasis on the — relative to English  
 13 eyes — the subjective intention of the parties in  
 14 setting up the agreement. If we are going to get into  
 15 debates about issues of construction in closing that  
 16 would obviously be rather undesirable, because you have  
 17 not heard any evidence on that at all and there is  
 18 nothing in the case to deal with that.  
 19 THE CHAIR: No one has suggested that there is any issue of  
 20 construction on which we are going to need to take  
 21 evidence of any form.  
 22 MR WILLIAMS: Any submissions we make will be based on the  
 23 evidence that Mr Gonell gave.  
 24 THE CHAIR: Thank you very much.  
 25 So it is the hot-tub now.

8

1 MR SAUNDERS: Yes.  
 2 THE CHAIR: Right.  
 3 MR JOWELL: I will call ---  
 4 THE CHAIR: Yes, I think both.  
 5 MR JOWELL: And need to be sworn.  
 6 THE CHAIR: Yes, they do.  
 7 MR ROBIN NOBLE (sworn)  
 8 DR JORGE PADILLA (sworn)  
 9 Questions by THE TRIBUNAL  
 10 MR WILLIAMS: I do not know if you want me to go through the  
 11 formalities in relation to signatures on reports and all  
 12 the rest of it, Madam?  
 13 THE CHAIR: No, I do not think so.  
 14 MR WILLIAMS: There are some corrections to Mr Noble's  
 15 report which I should just introduce, if I may?  
 16 THE CHAIR: Those have been sent in a letter to the  
 17 Tribunal. We have all had that.  
 18 MR WILLIAMS: If you are prepared to take them as read ---  
 19 THE CHAIR: I think we should take those as read and I think  
 20 in terms of going through the attestation to the  
 21 contents of the reports, I think that could be done when  
 22 they come to give their individual evidence.  
 23 MR WILLIAMS: Okay. Mr Noble, the corrections that were set  
 24 out in the letter from the Tribunal, do they affect any  
 25 of the opinions or conclusions expressed in your

9

1 reports?  
 2 MR NOBLE: No, they do not.  
 3 MR RIDYARD: You have received a list of the topics we would  
 4 like to go through in this session. As has been  
 5 explained, I am sure you are aware already, the plan  
 6 will be to go through a number of questions under each  
 7 of those topic headings. We will more or less try to  
 8 alternate who goes first, although sometimes it may be  
 9 more appropriate to switch the order.  
 10 Clearly I am going to be leading those questions, as  
 11 you know, but it is important to emphasise that it is  
 12 the whole Tribunal that is involved in this procedure.  
 13 I am sure my colleagues will chip in with questions as  
 14 we go through. It is very important, of course, that  
 15 your responses are addressed to the whole Tribunal and  
 16 you deal with them in that way.  
 17 Also, it is almost unnecessary for me to say but  
 18 I will say it anyway: you understand your duty is to  
 19 assist the court and we certainly need assistance on  
 20 this case, as in other cases, from your expertise and we  
 21 are expecting you to provide answers that help us to get  
 22 to where we want to get to. We understand where you are  
 23 coming from in your reports, but just to re-emphasise,  
 24 you know, we do want your help and we expect that from  
 25 you.

10

1 Okay. So, without further ado, our first topic is  
 2 the question of market definition. The first question  
 3 maybe I can address it to Dr Padilla in the first  
 4 instance. This is this distinction between whether we  
 5 would look at the market as being a market for chipsets  
 6 to all OEMs in aggregate or individual markets for the  
 7 supply of chipsets to either or both Samsung and Apple.  
 8 You have both signed up to the notion of the SSNIP  
 9 test framework or the hypothetical monopolist framework.  
 10 So my first question, Dr Padilla, is: under that  
 11 framework, how, if at all, is that framework useful to  
 12 determine why you prefer your approach compared to the  
 13 approach taken by Mr Noble?  
 14 DR PADILLA: Right. So my understanding of the framework is  
 15 that, first, you need to identify a candidate market and  
 16 then, on that candidate market, you perform a number of  
 17 experiments. You try to see whether the products in the  
 18 candidate market define a market in itself, appropriate  
 19 market, or whether you should expand the boundaries of  
 20 that market.  
 21 Defining the candidate market is a tricky issue  
 22 which is not really --- there is no theory about it, but  
 23 I think that the common practice is to start as narrow  
 24 as possible, to make sure that, given that the  
 25 experiment is one-directional, whether you expand, you

11

1 do not end up with a market that is too wide in the  
 2 first place.  
 3 What helps you in order to identify where to start  
 4 is the theory of harm that you are trying to assess,  
 5 because ultimately market definition is just an  
 6 instrument, a tool, that should help you understand the  
 7 cogency and the correctness or not of the theory of  
 8 harm.  
 9 The theory of harm in this case concerns  
 10 negotiations between Apple and Qualcomm, Samsung and  
 11 Qualcomm, regarding both royalties but also chipsets.  
 12 MR RIDYARD: Sorry to interrupt. The theory of harm --- the  
 13 damage claim relates to Samsung and Apple, but the  
 14 theory of harm, does it not relate to everyone in the  
 15 market?  
 16 DR PADILLA: My understanding is that the focus of the  
 17 debate is on Apple and Samsung and I think that I would  
 18 say 99.9% of the reports that both Mr Noble and I have  
 19 produced concern Apple and Samsung and in fact I think  
 20 that, on that basis, very little, if anything, is  
 21 discussed about the negotiations that Qualcomm has with  
 22 other OEMs.  
 23 MR RIDYARD: Let me just stop you there and allow Mr Noble  
 24 to come in.  
 25 MR NOBLE: So I agree with Dr Padilla that, as you say, the

12

1 SSNIP test is what we are using and I agree that one  
 2 should start small with a focal product, because it is  
 3 a one-way test, so there is a risk of starting too  
 4 large, that you just assume the market is bigger than it  
 5 is going to be, but — and I also agree with Dr Padilla  
 6 that we need to look at the theory of harm in order to  
 7 perform our market definition analysis, because market  
 8 definition analysis is case-specific. However, I think  
 9 as you alluded to, the theory of harm, as I understand  
 10 it from the Class Representative, is that there is  
 11 a market-wide set of behaviours that potentially impact  
 12 all OEMs in their negotiations about royalties and  
 13 therefore, to my mind, it makes sense therefore to start  
 14 market-wide with the focal product because of that and  
 15 in terms of the evidence that we have put forward,  
 16 I mean, to my mind, I mean, my reports look at the whole  
 17 market and also, I think, Dr Padilla's leveraging  
 18 analysis does not just look at Apple and Samsung, it  
 19 obviously does look at Apple and Samsung, but it does  
 20 look at all the other OEMs as well and so, in a sense,  
 21 you know, that is certainly my understanding that the  
 22 theory of harm is about all OEMs, not just Apple and  
 23 Samsung.  
 24 As you say, the damages claim is then about Apple  
 25 and Samsung, but it could easily have been, you know,

1 Huawei as well or some other OEM as well.  
 2 MR RIDYARD: Okay. In terms of — I mean, market definition  
 3 is there as a means to an end, something to make — to  
 4 provide a framework for our assessment. I mean, can you  
 5 maybe comment on how that would work? If we were to —  
 6 I mean, in principle, if we were to find that there  
 7 was — there might be an adverse effect against the  
 8 other OEMs but because of Apple and Samsung's position,  
 9 their extra leverage or bargaining power, whatever,  
 10 there was not an effect on them; what is the point of us  
 11 getting agitated about the effect on the other players  
 12 when the damages claim is just focused on these two?  
 13 MR NOBLE: Well, the reason for that is that there are two  
 14 mechanisms by which the theory of harm can have  
 15 an impact of Apple and Samsung. Mechanism one is  
 16 obviously the chipset negotiations between Apple and  
 17 Qualcomm and Samsung and Qualcomm, but mechanism two is  
 18 via the other royalty agreements, because you see lots  
 19 of evidence in the negotiations that they referred to as  
 20 "benchmarks" and also, you know, as I explained in the  
 21 context of the bargaining model, one can expect that —  
 22 you know, the outside option is to go and have  
 23 a litigation or some other kind of dispute where it is  
 24 quite possible that these benchmarks come into play and  
 25 of course there is some prospect in my judgment that

1 those might therefore influence the outcome of that.  
 2 So it is essentially the fact there are those two  
 3 elements. There is the direct element, which is Apple  
 4 and Samsung, and then there is that indirect element  
 5 which relates to all the other OEMs. So I think for  
 6 that indirect element, one needs to think about the  
 7 whole market as a whole because of course if Qualcomm  
 8 was not dominant at all, then in a sense the whole  
 9 theory of harm does not work.  
 10 MR RIDYARD: Dr Padilla, any comments?  
 11 DR PADILLA: I disagree on a number of fronts, as you can  
 12 imagine.  
 13 Number one is if indeed the theory of harm concerns  
 14 everybody, then I think that the case that both Mr Noble  
 15 and I have argued is incomplete, because there is no  
 16 discussion in our reports about the negotiations, both  
 17 in terms of royalties or chipsets, that Qualcomm has  
 18 with any of the other OEMs. There is nothing in that  
 19 regard. We do not know where the negotiations with  
 20 Huawei, where the negotiation with CDE, there is nothing  
 21 of that sort, and there is nothing in the evidence that  
 22 we have produced, the economic evidence, that helps us  
 23 understand to what extent these kind of  
 24 cross-contamination effect that Mr Noble was just  
 25 referring to exists. There is no discussion about

1 whether the agreements — OEM agreements or negotiations  
 2 between Apple and Qualcomm, for example, were influenced  
 3 by other agreements.  
 4 So if that is the theory of harm, then I am afraid  
 5 that the Tribunal does not have the elements to decide  
 6 on that theory of harm.  
 7 I think that the Tribunal has elements to assess  
 8 whether or not there was abusive conduct in relation to  
 9 the negotiations between Qualcomm and Apple and Qualcomm  
 10 and Samsung. In fact, I think that when we are  
 11 discussing in our reports those negotiations, in fact  
 12 there is no discussion, as far as I can recall, in any  
 13 of the reports that Mr Noble and I have produced of how  
 14 other agreements could have influenced those  
 15 negotiations. When we are talking about the  
 16 negotiations between Apple and Qualcomm, we are looking  
 17 at different points in time and all the discussion is  
 18 about what was discussed, what was not discussed, what  
 19 was the scope, the extent to which the chipset alleged  
 20 dependency matters.  
 21 So I think that it is because of that, for  
 22 intellectual consistency, that it is good to look at the  
 23 market in the way that we are looking at, in an  
 24 OEM-specific way.  
 25 MR RIDYARD: Just to push back a bit on that. You do look

1 at the other OEM deals --- and we will talk later on  
 2 about your leverage analysis, but you do look at the  
 3 other OEMs when you do that leverage analysis, do you  
 4 not?  
 5 DR PADILLA: As a sensitivity analysis. The main focus of  
 6 my third report, the leveraging analysis, is on Apple  
 7 and Samsung and I think that, frankly, I could have  
 8 stopped there. I think that the analysis is, you know,  
 9 in terms of preponderance of evidence, looking at  
 10 whether there is additional evidence that I could look  
 11 at of a relationship between royalties and chipset  
 12 dependency or reliance, but that is only as a robustness  
 13 test, no more.  
 14 MR RIDYARD: Then just to move on then to the next point.  
 15 I think this is, Dr Padilla, for you --- no, sorry, to  
 16 Mr Noble. Just in terms of the practical differences  
 17 between your two approaches, in practice is the main  
 18 difference when it comes to looking at market shares, is  
 19 the main difference the difference between including or  
 20 excluding self-supply? Is that what it all comes down  
 21 to?  
 22 MR NOBLE: There are two differences I think that we arrive  
 23 at. One difference is the self-supply. The other one  
 24 is then the extent to which we have different  
 25 generations in the same relevant market.

1 MR RIDYARD: We are certainly going to come on to  
 2 generations in a moment. In terms of the market share  
 3 numbers, as it were, it is almost a question of  
 4 sequencing, is it not? You agree that self-supply is  
 5 relevant to the overall assessment but not in market  
 6 definition, whereas Dr Padilla's approach has  
 7 self-supply in the market shares and the market  
 8 definition?  
 9 MR NOBLE: Precisely, yes. I think Dr Padilla and I both  
 10 agree self-supply needs to be part of the assessment and  
 11 the question is where. I think you are right, that is  
 12 the key distinction. I say that it should be analysed  
 13 when one comes on to the individual negotiations and  
 14 I think, as I understand Dr Padilla, he's saying you  
 15 should look at this in market definition because he is  
 16 starting at the OEM.  
 17 DR PADILLA: If I may, I agree, but I think it is important  
 18 to clarify the following: although it is of secondary  
 19 importance in the context of the case and I would think  
 20 that in general market definition is not the critical  
 21 issue here because the differences are to some extent  
 22 intellectual more than practical in terms of the  
 23 consequences.  
 24 Including self-supply seems to me intellectually  
 25 rigorous and correct and the reason is when Qualcomm is

1 negotiating chipset prices with Samsung or when Qualcomm  
 2 is negotiating chipset prices with Apple, Samsung can  
 3 leverage its ability to self-supply. Apple can then  
 4 leverage its ability to self-supply. They may --- that  
 5 self-supply may have no impact on the chipset prices  
 6 that Huawei, CDE and others pay and we had defined  
 7 a broad market, then that would be the case, but if we  
 8 are trying to understand the chipset prices paid by  
 9 Apple and Samsung, that self-supply is a constraint on  
 10 those chipset prices and that is why it is important to  
 11 keep it in, obtain the right market share figures.  
 12 Ultimately, as you may have noticed, and I think we also  
 13 make clear in the joint statement, market shares are  
 14 high with one market or the other. So countervailing  
 15 buyer power is going to be fundamental.  
 16 MR RIDYARD: I do not think there is any disagreement really  
 17 on the need to include self-supply in the assessment.  
 18 Can I just ask a very detailed question, Dr Padilla,  
 19 on your approach. If you look at the chip --- your  
 20 market for Apple, the sort of chipsets of the kind  
 21 purchased by Apple is the descriptor, that includes  
 22 Apple's --- there are some very specific products that  
 23 Apple buys which have been customised, it is so-called  
 24 "thin modem chipsets". Can you just on a kind of  
 25 practical level explain how they are different from the

1 kind of chipsets that are supplied to Samsung and other  
 2 OEMs because of Apple's, you know, customisation  
 3 requirements on these thin products. How do the thick  
 4 products, which is not what they are called obviously,  
 5 how do they form part of the same market as the thin  
 6 products? What is the mechanism whereby they are part  
 7 of the same market? Is that a supply-side substitution?  
 8 DR PADILLA: So my understanding and I am not a technical  
 9 expert --- so my understanding is that basically in a  
 10 chipset you have like two components, the application  
 11 processor and the baseband component. The thin chipset  
 12 is one that does not have the application processor,  
 13 because Apple wants to retain its own application  
 14 processor, and the integrated has both.  
 15 I think that our view, and I think that this is  
 16 a common view, is that both thin and thick compete with  
 17 each other. To some extent, and it is not quite correct  
 18 to think about the thin as a thick one in which you have  
 19 removed the ---  
 20 MR RIDYARD: On the demand side.  
 21 DR PADILLA: Yes. I do not know if you have any comments on  
 22 that. There is no need to ---  
 23 MR NOBLE: I would agree and I think my understanding of the  
 24 factual evidence is that the way Qualcomm builds its  
 25 modems is that, in a sense, it has these sort of Lego

1 bricks. It has a modem and it then has application  
 2 processors and I think there are a few other parts to  
 3 the chipset as well and it then builds families around  
 4 those. So, for example, I think there is the X55M ---  
 5 there has been quite a lot of discussion around that.  
 6 That is the first 5G modem that Apple purchased.  
 7 Various other OEMs also purchased that same modem, but  
 8 there is also a Snapdragon 865 system on a chip which is  
 9 the thick version of it which, as I understand it, is  
 10 closely related to the X55M so it is essentially, very  
 11 roughly, the X55M with the other parts added on around  
 12 it and other chipset players also have these --- they  
 13 offer both options.  
 14 MR RIDYARD: Then just a question about how we go about our  
 15 task in choosing between your two approaches. I mean,  
 16 does one approach to the market definition preclude the  
 17 other? Is there a right answer to this question, or  
 18 could we take the view that both are valid ways of  
 19 looking at things and we should look at both?  
 20 DR PADILLA: It is for you to decide. I think that an  
 21 option is to leave the market definition open, given  
 22 that ultimately things do not, you know --- nothing  
 23 really hinges on that. But I think that in order to  
 24 understand the theory of harm, the intellectual  
 25 discipline of considering an OEM-specific market is

21

1 helpful and when you read both Mr Noble's reports and my  
 2 reports on conduct, you are going to find that actually  
 3 what we are talking all the time about is whether or not  
 4 Apple and Samsung, respectively, were reliant on  
 5 Qualcomm and what other OEMs were purchasing features ---  
 6 it does not feature in the discussion. So  
 7 intellectually ---  
 8 MR RIDYARD: You have made that point.  
 9 DR PADILLA: --- (inaudible - overspeaking). At the end of  
 10 the day I do not think that you have to make a finding.  
 11 MR RIDYARD: I understand that, but one could look  
 12 at --- clearly we need to look at the bargaining position  
 13 between Samsung and --- sorry, between Qualcomm and these  
 14 two big users. There is no question about that. The  
 15 question really is could we also consider both ways of  
 16 looking at the market definition are valid and it may  
 17 be, Mr Noble, you would like to comment.  
 18 MR NOBLE: I would certainly say that the market-wide  
 19 position is a valid position because in order to  
 20 consider the whole theory of harm one needs to consider  
 21 the positions of lots of different OEMs and Qualcomm  
 22 needs to be dominant at the macro level, as it were.  
 23 I mean, I have been scratching my head about can you do  
 24 it the other way round and does it make a difference?  
 25 I think potentially you could do it the other way round

22

1 and it might not make a difference, in the sense that if  
 2 you start stepping out from one of the OEMs, if there is  
 3 sufficient supply-side substitution, then I think  
 4 potentially you end up at the same answer anyway because  
 5 I think Dr Padilla and I --- I think there is some  
 6 comments in the joint statement --- I forget exactly  
 7 which number it is, but I think we are aligned on the  
 8 fact that there is supply-side substitution between  
 9 different types of chipsets, high quality, low quality,  
 10 thin, SoC, etc, and since the OEMs often buy the same  
 11 chipsets as one another, there is not a lot of  
 12 bespoke-ness about the chipsets and it is also not  
 13 obvious how much price discrimination there actually is.  
 14 I mean, yes, people do pay individualised prices,  
 15 but are they paying those because of price  
 16 discrimination or are they paying those because of  
 17 volume-related points? Apple often pays lower prices  
 18 than other people, but Apple often buys a lot more of  
 19 that specific chipset than everybody else and trying to  
 20 disentangle those I think is quite difficult.  
 21 So it is not clear to me --- that is quite a long  
 22 answer to say I think you can start at the individual  
 23 OEM and then still sort of aggregate up and then end up  
 24 in the same or very similar place.  
 25 MR RIDYARD: Yes.

23

1 DR PADILLA: What I would, you know, find problematic is if  
 2 the Tribunal aggregates OEM-specific markets using the  
 3 supply-side substitution arguments of Mr Noble. I think  
 4 that would be a conceptual mistake and a bad precedent.  
 5 Using those arguments, basically you would be ruling out  
 6 the possibility of identifying price-discrimination  
 7 markets. So, no, we do not agree on supply-side  
 8 substitution. There is price discrimination. There is  
 9 quite a bit of price discrimination, because even the  
 10 volume effects are the result of different competitive  
 11 constraints. If I have --- can self-supply, I am going  
 12 to buy less. If I am buying less, maybe I get  
 13 a different price. If I am going to self-supply, I may  
 14 push pressure on a lower price.  
 15 Apple and Qualcomm, Samsung and Qualcomm were  
 16 negotiating about chipsets bitterly, fiercely, and  
 17 trying to obtain a competitive advantage vis-à-vis the  
 18 other OEMs. It is easy to identify who your  
 19 counterparty is. You can distinguish Apple from  
 20 Samsung. There is no arbitrage and they were paying  
 21 different prices. That seems to me the poster child  
 22 example of a price discrimination market.  
 23 MR RIDYARD: I think your evidence on both of those sides is  
 24 very clear on that. We understand where you are coming  
 25 from.

24

1 Let me move on then to the distinction between UMTS  
2 and CDMA chipsets.

3 THE CHAIR: Could I just, sorry to interpose, just before we  
4 get on to the next question, can I ask about the concept  
5 that has come out a little bit in the factual evidence  
6 about competition for the slots and phones and the  
7 suggestion that there is some kind of bidding market  
8 when there is a new slot opening for competition, that  
9 different suppliers are going to compete to be selected  
10 by Apple or Samsung for a particular new slot, eg the  
11 slot on the 5G iPhone.

12 Do you see this as a bidding market and does that  
13 impact how you approach the market definition in this  
14 regard, as in whether it is an OEM-specific market or  
15 a market-wide market definition? Why do I not start  
16 with Dr Padilla on that.

17 DR PADILLA: Yes, I think that that is very relevant.  
18 I think that the bidding market may or may not be  
19 a bargaining market. This bidding for the slot is  
20 OEM-specific. The slot is OEM-specific. What matters  
21 fundamentally is whether the competitors for the slot  
22 are the same or different. If competitive constraints  
23 vary across OEMs, you need to define OEM-specific  
24 markets and there is a fundamental difference in the  
25 case, you know, not always, but in many years, which is

1 that, for example, Samsung could bring in its  
2 self-supply. Apple could not. There were other times  
3 in which Apple had the opportunity to bring its own  
4 supply to compete for that slot and that changes the  
5 outcome quite significantly.

6 THE CHAIR: So you do understand this to be a type of  
7 bidding market?

8 DR PADILLA: It is a bidding market.

9 THE CHAIR: Mr Noble.

10 MR NOBLE: So I think when we are thinking about whether or  
11 not something is a bidding market, it is not enough just  
12 to identify that there are slots that need to be filled,  
13 because you can think of almost any market that looks  
14 like that. If I am a manufacturer, I have slots and  
15 I think there is a continuum from one end of the  
16 spectrum where something is just completely atomised  
17 that there are so many slots, there is one coming up  
18 every day, I do not think people would characterise that  
19 as a bidding market because there are so many bids ---

20 THE CHAIR: But that is not the case here.

21 MR NOBLE: Exactly, they are just purchases. But there are  
22 quite a lot of slots. Certainly if we look across the  
23 market, Apple is the exception that has fewer slots than  
24 other OEMs, but Samsung has an awfully wide range of  
25 phones. Certainly if you look globally, there are often

1 many, many variants of individual handsets sold in  
2 different locations with slightly different  
3 specifications and so --- and that is --- again, there are  
4 many other OEMs that adopt a model that looks much more  
5 like Samsung where they have a very large number of  
6 handsets and, again, strictly speaking, you might say  
7 each one of those is a slot that you could bid for.

8 THE CHAIR: So Dr Padilla said categorically it is a bidding  
9 market. Do you conceptualise this as a bidding market  
10 or not?

11 MR NOBLE: Well, I think in economic parlance "bidding  
12 market" means a particular thing so it is certainly  
13 a market in which bids are made. I do not think it  
14 meets the requirements of what one would classically  
15 call a "bidding market" though.

16 THE CHAIR: So ---

17 DR PADILLA: If I may just one point that I think follows  
18 directly from what we have just heard. Precisely, there  
19 is a fundamental difference between Apple, Samsung and  
20 others. Apple has a limited number of slots. Apple  
21 carries very significant volume. Apple is unique in  
22 many respects. Competition for those slots is of  
23 a nature that is somewhat different from that of  
24 Samsung. Samsung is also different from other OEMs in  
25 terms of volumes, but those are the differences that

1 explain differences in chipset prices, in terms and  
2 conditions, which I think that you can identify when you  
3 are focusing on an OEM-specific market definition and  
4 that you will lose --- all that texture will be lost when  
5 you aggregate the market.

6 THE CHAIR: Thank you. Sorry, Mr Ridyard.

7 MR RIDYARD: Thank you.

8 Let us move on to the UMTS/CDMA distinction. I will  
9 use those terms as a bit of shorthand, but just I think  
10 we understand what we are talking about when we are  
11 talking about those two types of chipsets. Clearly the  
12 dominance claims are strongest against Qualcomm on the  
13 CDMA for reasons that I think we all understand.

14 MR NOBLE: Just to clarify, and I think this is clear, but  
15 when we say "CDMA", we mean it in the CDMA one and  
16 CDMA 2000 sense, as opposed to the long-form code  
17 division multiplex, because I think in the context of ---  
18 I think I heard earlier Qualcomm also interprets the  
19 acronym "CDMA" in a much broader sense, that WCDMA,  
20 which is ---

21 MR RIDYARD: I am ---

22 MR NOBLE: I just wanted to clarify that that is ...

23 MR RIDYARD: The ones that Verizon and China Telecom and so  
24 forth ---

25 MR NOBLE: Yes.

1 MR RIDYARD: Mr Noble, the SSNIP test is about considering  
 2 a hypothetical monopolist. Here, in your client's case,  
 3 there is a real-life monopolist and it is Qualcomm.  
 4 They are pretty much the only show in town on CDMA  
 5 chipsets. So why cannot we just look at --- we know  
 6 that, you know, we understand that Qualcomm did indeed  
 7 charge a premium for CDMA chipsets compared to the UMTS  
 8 chipsets of a similar kind. So does that answer our  
 9 SSNIP test question all in one go without further ado?  
 10 MR NOBLE: Well, it might do. I think it is --- I think the  
 11 logical flow that I followed in this is to say, first,  
 12 are UMTS and CDMA 2000 --- are they similar qualities, in  
 13 the very broadest economic sense, that you might want to  
 14 pay more for them, just because one is better than the  
 15 other? As far as I can see, that is not true. They are  
 16 similar sorts of standards, with similar sorts of  
 17 connectivity.  
 18 I think the next question is then: is there a cost  
 19 difference, a variable cost difference between the two,  
 20 because if one were to cost more to make, then one might  
 21 expect that the price would be higher and then that  
 22 might tell you something different from what you have  
 23 just said?  
 24 MR RIDYARD: If prices are related to costs.  
 25 MR NOBLE: Yes, if prices are related to costs.

1 I do not think there is evidence of that. If  
 2 anything, I have seen evidence that says that the prices  
 3 seem to be the same, or in fact sometimes it appears  
 4 that the cost of making a CDMA chipset might be less  
 5 than it might be a UMTS one because there are some  
 6 versions of UMTS chipsets that are actually CDMA  
 7 multi-mode that are compatible with everything and they  
 8 have the CDMA part disabled so it is a further  
 9 manufacturing step.  
 10 Then I think the third question, which I think is  
 11 what you were getting at originally, in some instances,  
 12 although not all, we observe that Qualcomm does appear  
 13 to charge a CDMA premium. It calls it I think the "CDMA  
 14 adder". Then there is a question, well, how big is  
 15 that? Because if it was very small, we might not be  
 16 very interested in it but if it is bigger, then it is  
 17 potentially telling us something useful in the context  
 18 of market definition. The data I have seen suggests the  
 19 CDMA adder is \$3, \$4, \$5. It varies, I think, precisely  
 20 which chipset, precisely which time period, but the kind  
 21 of base price that you are talking about for these  
 22 chipsets is typically \$10, \$15, \$20.  
 23 So this is a significant delta in the prices and so,  
 24 on its face, I think it is consistent with the idea that  
 25 somebody holds market power in the product called "CDMA"

1 and that they are exerting it in some instances to some  
 2 degree.  
 3 MR RIDYARD: 25% price premium sounds --- I mean, what is the  
 4 point of having a monopoly unless you charge a high  
 5 price for it and you are saying they have a monopoly in  
 6 this product and they charge quite a hefty price premium  
 7 for it. So does that --- I mean, in classic terms you  
 8 would say, well, this is kind of getting us into  
 9 cellophane fallacy area, that if it is an actual  
 10 monopolist and it is charging this high price, obviously  
 11 it has decided not to charge \$10 more for CDMA and it  
 12 has decided to charge whatever it is, \$3 more, whatever  
 13 the number is, so does that mean that evidence we have  
 14 at the market prices which exist is tainted by the fact  
 15 that, you know, there will be less substitution if we  
 16 looked at it at competitive levels but an artificial  
 17 amount of substitution arises because it is broadly  
 18 already at the monopoly price?  
 19 MR NOBLE: Well, I think there is a question because I think  
 20 there is a distinction between being able to charge  
 21 a price that is high enough that it sends a signal about  
 22 that these are in separate relevant product markets and  
 23 a price that is, in a sense, taking advantage of the  
 24 full short-term monopoly rent that might be available to  
 25 you. I think there are two reasons to think that

1 Qualcomm might not have taken full advantage of that  
 2 rent and therefore may not have reached the point at  
 3 which the cellophane fallacy kicks in.  
 4 So the first reason is that I think there are  
 5 barriers to entry to chipset manufacture but, as with  
 6 all technical barriers, they are surmountable at some  
 7 price so the higher you put the price, the greater the  
 8 incentive that you create for someone to surmount those  
 9 barriers and create a rival chipset.  
 10 So it might be the case that Qualcomm has a desire  
 11 not to encourage entry. If it responded to that desire  
 12 very strongly, then we might be very comfortable, in the  
 13 sense that, well, where is the problem?  
 14 MR RIDYARD: I am not saying that all. I am just saying  
 15 every --- pretty much every monopolist decides to stop  
 16 raising prices at some point and on your view of the  
 17 world ---  
 18 MR NOBLE: The reason I think quite carefully about this is  
 19 because there is a coherent argument against the Class  
 20 Representative's case that says there is one monopoly  
 21 rent. Where is the monopoly rent? On the Class  
 22 Representative's case, it is in chipsets and if you take  
 23 all of the monopoly rent in chipsets, then there is no  
 24 more to take anywhere else. Therefore, the theory of  
 25 harm does not work.

1 MR RIDYARD: Yes.  
 2 MR NOBLE: So I think there is then a question, well, okay,  
 3 is this all of the monopoly rent? The reason one might  
 4 think it is not is because actually if you have reached  
 5 the point at which you can force people to be elastic,  
 6 then you might think, well, we are close to that point,  
 7 but Qualcomm might restrain the price that it charges  
 8 for two reasons. One is to — because it does not wish  
 9 to encourage entry and the second is because it needs to  
 10 save some of that rent because it wishes to use that in  
 11 the chipset negotiation — in the royalty negotiations.

12 MR RIDYARD: Dr Padilla.

13 DR PADILLA: There are a lot of things, if I may unpack.  
 14 I would like to cover them in a certain order.  
 15 First, is there a premium? To tell you the truth, that  
 16 is a Pandora's box. It is very complicated. If you  
 17 look at chipset pricing, chipset pricing, the price of  
 18 a chipset, tends to vary over time and tends to decline  
 19 over time. Developing a chipset involves some fixed  
 20 cost and some variable costs and in my experience, and  
 21 I think you can document that by looking, for example,  
 22 at the Commission's decision in the Icera case, what  
 23 happens is that fixed costs are amortised over time in  
 24 a declining way. So as chipsets get sold, the company  
 25 is covering the fixed costs and then, you know, the

1 prices go down and converge in a sense towards the  
 2 short-run marginal costs.  
 3 Now, that is important because there are two  
 4 dimensions then that become critical over and above the  
 5 variable cost of production. One is what is the fixed  
 6 cost? Second, what is, when you are looking at the CDMA  
 7 chipset or a UMTS chipset, whether they are at the same  
 8 point in their lifetime or not?

9 So there may be a high premium, what you think is  
 10 a high premium, but it is because some standard CDMA's  
 11 are an early life, the UMTS is lower life and even at  
 12 the same point in time one may sell a lot and the other  
 13 one may sell less.

14 So establishing whether or not there is a premium on  
 15 the magnitude is very, very complicated and it would  
 16 have to be done almost chipset by chipset and, frankly,  
 17 I have worked that to some extent and I see that but not  
 18 here.

19 Second, how do we interpret the premium? Is the  
 20 fact that there is a premium telling us that there is  
 21 a separate market? Well, let me give you an analogy.  
 22 Let us think about an iPhone, an Android — a Samsung  
 23 Android phone and a Xiaomi Android phone. I think that  
 24 the CMA has concluded that they are all in the same  
 25 market, yet the iPhone sells at a premium. Competition

1 between the two Android phones, the Xiaomi and the  
 2 Samsung, is bound to be stronger. Maybe that means that  
 3 the Android prices are going to be somewhat more  
 4 similar. Apple sells at a premium, but still there is  
 5 a competitive constraint. Absent that competition,  
 6 Apple will be able to charge even higher prices.

7 So even if there was a premium, that in itself does  
 8 not allow us to conclude that there are separate  
 9 markets.

10 The SSNIP test. The SSNIP test cannot be answered  
 11 by reference to the premium, because the SSNIP test, as  
 12 you correctly pointed out before, needs — when you  
 13 referred to the cellophane fallacy — needs to look at  
 14 the competitive price and whether there is — what would  
 15 happen in response to a 5% to 10% increase in the  
 16 competitive price.

17 Now, assuming that the price of the UMTS chipset is  
 18 the competitive price for CDMA is incorrect, given that  
 19 the chipsets may be at different point in time in their  
 20 lifecycle and, in any event, have different volumes. So  
 21 we will need to think about whether there is a 10 — 5%  
 22 to 10% premium over the competitive price.

23 MR RIDYARD: I understand.

24 DR PADILLA: Finally, the last point I would like to make in  
 25 response, and this is elaborating on something Mr Noble

1 just said, is that the theory of harm that the CR is  
 2 presenting is kind of a Goldilocks theory of harm.  
 3 Qualcomm has to be dominant somewhere (CDMA, 5G), but  
 4 not too dominant or dominant but self-restrained in the  
 5 chipset market, and, on the contrary, show its nasty  
 6 face exclusively in the licensing market, because if we  
 7 had a monopoly in CDMA, if we had a monopoly in 5G, then  
 8 what stops the monopolist from charging monopoly prices?  
 9 There are no FRAND commitments here.

10 The story that this is going to provoke entry means  
 11 that then we do not have dominance because then we do  
 12 not have a monopoly.

13 MR RIDYARD: We will come on to some questions on that in  
 14 due course. I understand where you are coming from.

15 I think I have heard enough to know that we are not  
 16 going to get to a neat answer to these questions, but  
 17 that was a useful discussion of some of those issues.

18 Actually I think it would have been — could have  
 19 been useful to have had some of that articulated in the  
 20 experts' reports, but we are where we are on that.

21 Dr Padilla, on this UMTS/CDMA distinction, your  
 22 contention is that they are in the same market,  
 23 obviously. So what would — can you just talk me  
 24 through what would prevent a hypothetical monopolist in  
 25 CDMA raising price by a small but significant amount

1 above the competitive level? What would make it regret  
 2 doing that?  
 3 DR PADILLA: So vis-à-vis Apple or vis-à-vis Samsung because  
 4 the analysis in my case is ---  
 5 MR RIDYARD: Yes.  
 6 DR PADILLA: So the issue is as follows: if you look at the  
 7 purchasing patterns of, say, Apple, because the argument  
 8 carries on or carries through mutatis mutandis, let us  
 9 focus on Apple. Apple is buying mostly UMTS chipsets  
 10 and a few CDMA chipsets. Suppose that there is a very  
 11 significant increase in the price of the CDMA chipset.  
 12 That means that the margin that Apple is going to make  
 13 on CDMA phones is less than the margin that it is going  
 14 to make on UMTS phones. Does that mean that it is going  
 15 to give up all CDMA demand? Not necessarily. But it  
 16 can choose how much effort to push in one direction or  
 17 the other, how much marketing effort to place here or  
 18 there, how much marketing support to provide to mobile  
 19 phone operators that are using or relying on UMTS  
 20 networks versus CDMA networks.  
 21 That is the dimension of substitution that I think  
 22 that exists and if you think about it logically, and  
 23 I think that all the evidence that we have seen suggests  
 24 that when Apple is discussing chipset prices with  
 25 Qualcomm, it is discussing chipset prices for its

1 portfolio. Looking at CDMA phones, UMTS phones, there  
 2 are a number of slots and they --- and Apple can  
 3 arbitrate in the way that I have just mentioned.  
 4 MR RIDYARD: Mr Noble, comments on that mechanism, is that  
 5 how you see this working?  
 6 MR NOBLE: Well, I think the real question that helps us  
 7 disambiguate between the two about whether CDMA and UMTS  
 8 are competing or not is really about whether or not we  
 9 think that OEMs see the two as substitutes or whether  
 10 OEMs see them as complements to one another.  
 11 MR RIDYARD: When you use the word "complement", what are  
 12 you talking about? So you mean in the ordinary language  
 13 sense or the economic sense?  
 14 MR NOBLE: In the economic sense. The question for me  
 15 is: do we see OEMs offering a portfolio of equivalent  
 16 phones that are on both networks?  
 17 MR RIDYARD: That is nothing --- that is not the economic  
 18 sense of "complements", is it? A complement in  
 19 economics is if the price of A goes up, demand for B  
 20 goes down.  
 21 MR NOBLE: Well, in a sense I think what they want to offer  
 22 to their consumers is an attractive portfolio of  
 23 products.  
 24 MR RIDYARD: Yes.  
 25 MR NOBLE: And so the question mark is --- so maybe I start

1 again.  
 2 So in equilibrium, when we are talking about the  
 3 market, you have OEMs that are offering a portfolio of  
 4 phones. They offer, I think, in Dr Padilla's analysis,  
 5 a portfolio of phones on UMTS networks and a portfolio  
 6 of phones on CDMA networks. They are seeking to try and  
 7 maximise their sales by offering attractive phones.  
 8 Then the SSNIP test posits the idea that we shock that  
 9 system by imposing a 5% to 10% price rise but only on  
 10 the CDMA chipsets, not on the UMTS chipsets. I think  
 11 the question mark then is what do we anticipate that the  
 12 OEMs are going to do? Are they going to withdraw, you  
 13 know, certain handsets from CDMA networks? Are they  
 14 going to somehow try and encourage customers to switch  
 15 across from one to the other? I think if they are going  
 16 to withdraw the handsets, I think the question mark for  
 17 me is: why are they --- why is it now sufficiently  
 18 unattractive for them to do that?  
 19 MR RIDYARD: I think Dr Padilla's answer to that was because  
 20 it is now less profitable to sell CDMA phones and  
 21 therefore I will put more effort into selling UMTS  
 22 phones. I will not abandon Verizon or ---  
 23 MR NOBLE: Yes, but I think then the question comes because  
 24 in a sense they are doing that in a derived demand  
 25 sense. So ---

1 MR RIDYARD: Yes, everything is derived demand here, is it  
 2 not?  
 3 MR NOBLE: Yes, but I think it is hard to get away from the  
 4 notion that ultimately it is the customer that is really  
 5 driving the attractiveness of any of these options and  
 6 so in the examples I gave in the joint statement and in  
 7 my report, I was imagining, okay, what happens if the  
 8 OEM passes on this extra cost to the end-consumer? The  
 9 price delta is very small and so the question for me  
 10 then is if there is this very small increase in a \$600  
 11 phone, then do you get enough substitution caused at the  
 12 consumer level between that one network and the other to  
 13 make it sufficiently unprofitable so that the OEM loses  
 14 sales on CDMA and such that the hypothetical monopolist  
 15 of CDMA chipsets loses sales on CDMA, is that likely to  
 16 be enough to defeat the SSNIP? I find that very hard  
 17 to --- you need a very, very high elasticity to make that  
 18 maths work, because of the dilution effect that you get.  
 19 MR RIDYARD: You just say effectively because of that  
 20 dilution, as an OEM, you just kind of ignore the  
 21 increase in price and just carry on regardless and  
 22 just ---  
 23 MR NOBLE: Well, so one option is you can put the price up  
 24 and then, you know, there is then not enough ---  
 25 MR RIDYARD: In different ---

1 MR NOBLE: Exactly, there is not enough substitution and  
 2 therefore you have not defeated the SSNIP, therefore you  
 3 have stopped expanding your market on CDMA.  
 4 The alternative as an OEM is that you could do  
 5 something that worsens the quality offering on CDMA and so  
 6 you can — but in a sense that is a debate to be had in  
 7 a CPO hearing which is about the kind of equivalence  
 8 between quality adjustments and price adjustments, but  
 9 I think it matters in this context because if you  
 10 withdraw a particular handset, you can think of that as  
 11 the quality — you know, the options available on the  
 12 CDMA network got a bit worse and you would think that  
 13 they would get a bit worse by about the amount of the  
 14 passed—on SSNIP essentially and, again, so you would  
 15 think it is a small delta in quality that has happened  
 16 and, again, it is back to the question of are consumers  
 17 likely to be elastic enough at the downstream level or  
 18 not?  
 19 DR PADILLA: If I may, I will use an analogy. Analogies are  
 20 always dangerous, but this is a complicated industry and  
 21 the analogy I will use comes from my first job which was  
 22 selling clothes.  
 23 Consider the following example: you are selling  
 24 clothes and you are selling sweaters and they are  
 25 different colours, green, red, yellow, and actually in

1 yellow there is kind of a monopoly. In green and red  
 2 there is much more competition. Preferences are such  
 3 that some consumers just want yellow. They will not  
 4 switch to green and red, unless with a lot of  
 5 persuasion. Does that mean that if you are the shop  
 6 selling sweaters of all colours, you are resigned to pay  
 7 whatever for the yellow colour? Not necessarily. You  
 8 may buy some, but you will do things to increase the  
 9 relative demand of green and red over yellow. You will  
 10 put the green sweaters and the red sweaters in the shop  
 11 windows. You will display them more prominently. You  
 12 may give them some marketing effort that you would not  
 13 give to yellow and that is the way that you discipline  
 14 the monopolist. That is what happens here.  
 15 Qualcomm sells CDMA, sells UMTS. Apple buys both  
 16 but actually buys very little in relative terms of CDMA.  
 17 There is a limit to what Qualcomm can charge in CDMA,  
 18 even if it faces less competition there than in UMTS,  
 19 and that is because Apple can orchestrate a change in  
 20 product mix by playing with a number of levers,  
 21 including marketing effort.  
 22 MR TURNER: Can I ask: can you just elaborate on that, what  
 23 those levers are and how we know that they are  
 24 effective, changing customer behaviour to move from —  
 25 DR PADILLA: When you are selling — an OEM is selling

1 phones, is selling these phones either directly or  
 2 through MNOs. You can put more emphasis, greater  
 3 advertising, provide greater marketing incentives to  
 4 those mobile networks, for example, that rely on UMTS as  
 5 opposed to CDMA. Given that CDMA and UMTS sometimes  
 6 sell in different areas, you can decide to allocate more  
 7 marketing efforts to sell in Europe or, in particular,  
 8 in the UK where you have UMTS phones and spend much less  
 9 in China, responding to the price pressure.  
 10 Now, you can tell me do you have evidence of that?  
 11 Well, that is an impossible proof, because if I am  
 12 correct, then the prices of CDMA have been constrained  
 13 to the point in which the optimal decision of purchasing  
 14 CDMA and UMTS, the product mix, is the one that we are  
 15 observing.  
 16 MR TURNER: But it is very different to your clothes  
 17 example. Why would you not maximise your sales in  
 18 Europe and maximise your sales in China?  
 19 DR PADILLA: That would be possible if you did not face  
 20 budget constraints and I think that there are budget  
 21 constraints. In fact, I think that yesterday I was in  
 22 a dinner and Sir Christopher Pissarides was saying to  
 23 Tim Harford there is one thing that we need to teach the  
 24 public and this is that there are budget constraints.  
 25 That also applies to Apple and Samsung. You have

1 a budget constraint on how you are going to push the  
 2 different products because you have margin targets and,  
 3 you know, those margins get reflected in the stock  
 4 value.  
 5 MR RIDYARD: I think I understand where the two of you are  
 6 coming from on the concepts, but let us focus in on the  
 7 actual evidence.  
 8 Dr Padilla, you present evidence on the fact of the  
 9 UMTS and CDMA phones selling side-by-side in what look  
 10 like broadly comparable price ranges. How does that —  
 11 how effective is that evidence as a way of testing the  
 12 hypothesis that we are looking at here?  
 13 DR PADILLA: That is an important question for the following  
 14 reason: I would think that, given the evidence about the  
 15 portfolio of products that Apple and Samsung sell, and  
 16 particularly if we focus on Apple, the CDMA/UMTS mix,  
 17 I could make the argument, even if there were no  
 18 overlaps. Yet, I was trying to see whether it was  
 19 reasonable to think that those that enter the shop  
 20 looking for the yellow sweater will be willing to switch  
 21 to the red sweater, because if there are many people  
 22 that will be willing to switch, then the argument  
 23 becomes stronger.  
 24 The way that I did so is by looking at countries  
 25 where the two networks co-existed, CDMA and UMTS

1 co-existed, and where the phones that were sold in those  
2 networks were selling at comparable prices. That tells  
3 me that there is some substitution between yellow and  
4 red.

5 MR RIDYARD: Does it? That tells you that they are both  
6 selling at similar prices, but does it tell you anything  
7 about substitution between them?

8 DR PADILLA: That is correct. It is consistent with  
9 substitution.

10 MR RIDYARD: It is consistent with lots of hypotheses, but  
11 is it testing the hypothesis?

12 DR PADILLA: It does not tell you there will be substitution  
13 in response to a price increase of one or the other.  
14 That is why I started by saying even in the absence of  
15 the price overlap, I could argue, even in the situation  
16 in which there is strict separation in demand, no  
17 substitution whatsoever, the argument carries through  
18 for the reasons that I mentioned before and I explained.

19 I think that that evidence suggests that there may  
20 be some substitution.

21 MR TURNER: So I understand your argument that there may be  
22 the ability to influence the market over a period, but  
23 if one is interested in a bid when a new version of the  
24 phone comes along, at that point, why would there be  
25 substitution at that point?

1 DR PADILLA: The reason is the following: Apple makes  
2 significant margins, if I am focusing on Apple, so it  
3 does not need to lose all CDMA in order to be willing to  
4 substitute. See I think that if there is a reduction in  
5 margin, Apple would be willing to defend that margin and  
6 force a reduction in the CDMA price by substituting some  
7 volume. It does not need to sell zero. It will only  
8 reduce volume somewhat. That has an important impact on  
9 its counterparty, in this case Qualcomm. Remember when  
10 what I mentioned before: chipsets involve very  
11 significant fixed costs which are amortised over time.  
12 Apple is by no means a small player. If Apple tells  
13 you: in response to your CDMA pricing, which I find  
14 excessive, I am going to cut my demand of CDMA phones by  
15 X%, that has a very significant impact on Qualcomm's  
16 ability, not only to sell CDMA to Apple but to sell CDMA  
17 to everybody else because now it will need to amortise  
18 those fixed costs —

19 MR TURNER: But Apple can make that decision when you are in  
20 an active bidding process for a new version of the  
21 phone, Apple can make — can factor that into its  
22 negotiations that it is going to reduce its CDMA  
23 dependency, even though it knows it has those levers  
24 that it can pull for the future.

25 DR PADILLA: I think that is precisely what I am saying,

1 that when it is negotiating, it is not negotiating CDMA  
2 in ignorance of what it can do in terms of its product  
3 portfolio. As you can see, and I think it is Padilla 4,  
4 when you look at the composition of CDMA — between CDMA  
5 and UMTS or the portfolio of these two OEMs, it varies  
6 continuously over time. It is not discrete. It is not  
7 like you buy or do not buy. You change the proportions  
8 between the two. I think that it is only reasonable to  
9 assume that that decision is influenced by relative  
10 prices of the chipsets.

11 MR RIDYARD: Mr Noble.

12 MR NOBLE: Yes, I mean, I think there is really two points  
13 that I would highlight in response to this. I think one  
14 is the fact that in the US, where I think this is most  
15 prevalent, because you have CDMA networks and UMTS  
16 networks, I presented evidence — I forget it was either  
17 in my eighth or ninth report — that indicated that it  
18 is heavily an MNO-led market and so you sell phones  
19 throughout MNOs and so that signals to me that there may  
20 well be some stickiness amongst customers to stick with  
21 the current network and I think, as Mr Ridyard just  
22 alluded to, I think there is a question mark about the  
23 power that this test has because observing the same  
24 price for a CDMA phone and a UMTS phone, it tells you  
25 that they are the same price, but that could be because

1 of substitutability or it could be because there is zero  
2 substitutability and these are entirely — you know,  
3 they are completely separate customer groups and it is  
4 just that you have cost-based pricing and you cannot  
5 tell the difference between those two just based on the  
6 data that we have.

7 But we do have other evidence, and I cited some of  
8 that in my report, about OEMs making submissions to the  
9 European Commission about their willingness to  
10 substitute, but I think it is also useful to look at the  
11 instance when Apple decided to launch a CDMA iPhone  
12 because Apple did originally launch on UMTS and, as an  
13 economist, that strikes me as a coherent entry strategy.  
14 You do not make phones at the moment. You are going to  
15 go from zero phones to some number of phones. You  
16 partner with launch partners who happen to be MNOs.  
17 That makes a lot of sense, particularly in the US where  
18 it is an MNO-led market. In order to do that, you  
19 obviously make a phone that is compatible with the MNO  
20 that you are going to launch with and you sign an  
21 exclusivity agreement because, you know, that is  
22 normally how one achieves buy-in from your launch  
23 partner.

24 So you go through that process. That exclusivity  
25 agreement is going to run out. What are you going to do

1 at the end of it? Do you carry on just selling UMTS  
 2 phones or do you also launch a CDMA phone, because you  
 3 have now penetrated the market? I think in that example  
 4 there is some very clear evidence from Tony Blevins that  
 5 it was very difficult for them to conceive of not  
 6 launching a CDMA phone because there are millions of  
 7 customers on the Verizon network that they cannot  
 8 access.

9 MR RIDYARD: I do not think Dr Padilla is suggesting they  
 10 have to give up one or the other; he is just saying  
 11 that — after that launch period they were selling to  
 12 both networks and acquired both types of chipset, but  
 13 they could vary the proportions that they bought, if  
 14 some event happened that made it more attractive to sell  
 15 to AT&T than to Verizon.

16 MR NOBLE: Yes, although I think one of the issues is that  
 17 in that particular example, if people are elastic  
 18 between UMTS and CDMA networks, they have already  
 19 performed their transition. They really want an iPhone.  
 20 One would expect that they would have been transitioning  
 21 away from the Verizon network on to the UMTS AT&T  
 22 network so that has already happened to a large degree.  
 23 So the group of people that are left on the Verizon  
 24 network are presumably less likely to switch than those  
 25 that would otherwise — that in another situation where

1 you would just launch on both networks simultaneously.  
 2 DR PADILLA: If I may, three very quick comments.  
 3 First, the submissions in question are irrelevant  
 4 because there is no dispute between Mr Noble and I that  
 5 if you want to manufacture a CDMA phone, you need a CDMA  
 6 chipset.

7 The point about not launching I am in full agreement  
 8 with you, but I think that what Mr Noble would have to  
 9 explain, in my opinion, is the evidence that is  
 10 presented in figures 3 and 4 in my fourth report, which  
 11 shows continuous variation in the product mix between  
 12 UMTS and CDMA. How can that be reconciled with the  
 13 stickiness that he is referring to? Even if there is  
 14 a stickiness at the consumer level, I still, as the OEM,  
 15 can play in terms of, you know, the emphasis that  
 16 I place on one product versus the other.

17 MR RIDYARD: Yes. I understand.  
 18 I think we have probably covered this topic quite  
 19 well, but can I just ask one last question on this  
 20 topic, and that is: I mean, Dr Padilla, in your analysis  
 21 you make some — you lay some stress on the fact that in  
 22 the CDMA countries, UMTS was sitting side-by-side so  
 23 there was AT&T and Verizon and the same or similar was  
 24 happening in the other territories where CDMA was  
 25 present, but, I mean, does that matter? Would your

1 argument be just the same if the United States had been  
 2 a complete CDMA place and then — because we are talking  
 3 about global markets for chipsets here. So does it  
 4 matter about whether — if you forced the choice to be  
 5 more, you know, a one-zero choice between territories,  
 6 would it make any difference to your argument or your  
 7 evidence?

8 DR PADILLA: No, it does not really matter.

9 I think what is helpful in order to — from  
 10 a persuasion perspective is to realise that CDMA  
 11 globally is not that important for either Apple or  
 12 Samsung, but, no, I agree with you.

13 MR RIDYARD: Well, I mean, okay, but, I mean, I guess the  
 14 question really is: so the substitution that we are  
 15 talking about could have happened by just deciding,  
 16 well, I will just sell more phones in Europe and fewer  
 17 in America?

18 DR PADILLA: Correct.

19 MR RIDYARD: Mr Noble, can you respond to that?

20 MR NOBLE: If one thinks that this is the right framework to  
 21 analyse it through, then I think logically you do not  
 22 have to analyse it within a specific territory. I think  
 23 practically I understand why Dr Padilla has done what he  
 24 has done because he is looking at consumer prices as  
 25 opposed to OEM to MNO prices, for example, and so —

1 MR RIDYARD: I think he would lose his price observations  
 2 then, would he not, under this scenario because —

3 MR NOBLE: You cannot operationalise the test because at  
 4 least if you do — you have data that says there are two  
 5 networks in the US and there are two phones and they are  
 6 pricing in dollars and they are the same customers with  
 7 similar purchasing power, it is much, much harder to  
 8 even do that analysis if you look at Europe versus US.

9 MR RIDYARD: That would be virtually impossible to make  
 10 sense of that, would it not?

11 MR NOBLE: Yes.

12 MR RIDYARD: So it is another way of saying even if —  
 13 Dr Padilla is saying his argument he thinks would work  
 14 even if you just put a line through the whole comparison  
 15 of the product prices?

16 DR PADILLA: Only Apple and Samsung know exactly how the  
 17 economics work. All that I would say in this connection  
 18 is that the evidence that I think that I have seen  
 19 indicates that they do not deal with these chipsets in  
 20 their negotiations with Qualcomm as silos.

21 MR TURNER: Sorry, just going back to your point that you  
 22 can impact the sales in — let us take Europe and China  
 23 with distinct geographical areas, you can impact the  
 24 sales by deciding how much marketing you spend in Europe  
 25 and how much marketing you spend in China and you say

1 resources --- marketing resources are necessarily  
 2 limited, they are not infinite, you are making  
 3 decisions, but that applies across the whole suite of  
 4 Apple products. It is having to make decisions about  
 5 whether it invests in phones or whether it invests its  
 6 marketing in computers, but that does not make them part  
 7 of the same market. So why is that --- why is this  
 8 a dominant consideration in your analysis? Sorry if  
 9 that is an ignorant question.  
 10 DR PADILLA: It is a very logical question. First, I think  
 11 that Apple is negotiating CDMA chipsets and prices and  
 12 UMTS chipset prices with Qualcomm.  
 13 MR TURNER: Yes.  
 14 DR PADILLA: All the other things may be relevant and will  
 15 be, you know, considerations for the CFO, but they are  
 16 not going to matter in that discussion. So it is the  
 17 possibility of substitution between those two products  
 18 that is going to discipline Qualcomm when pricing CDMA.  
 19 Whatever substitution happens outside those two products  
 20 is not going to discipline.  
 21 MR TURNER: I understand.  
 22 THE CHAIR: So we will take a five-minute break. Just to  
 23 remind you now, and I probably do not need to say it  
 24 again, you are in purdah under oath until released from  
 25 the hot-tub. I am sorry that that does mean that you

1 will be in purdah over the weekend. During that time  
 2 you will not be able to talk to your solicitors or  
 3 anyone else, whether in your legal team or outside your  
 4 legal team, about the case until the end of your  
 5 evidence in the hot-tub.  
 6 As you are aware, once the hot-tub has been  
 7 completed, you will be released from your oath and then  
 8 be able to return and have discussions with your  
 9 solicitors before you are then re-sworn for individual  
 10 cross-examination. Thank you.  
 11 MR WILLIAMS: Madam, can I say obviously most of the  
 12 discussion this morning has been at a fairly general  
 13 level, but it is just to remind both experts that when  
 14 we start referring to the evidence of specific witnesses  
 15 in other proceedings, then confidentiality issues may  
 16 arise. I just wanted to remind the experts of that,  
 17 because at one point we did start to drift in that  
 18 direction and I thought it was helpful to raise that.  
 19 THE CHAIR: I think most of the questions should be capable  
 20 of being dealt with in open session. As we previously  
 21 discussed, it is very difficult for us to now tell what  
 22 is confidential and what is not. So if we start  
 23 straying into a confidential area, I am expecting one of  
 24 you to pop up and say, "I am sorry, that is  
 25 confidential" and the transcript may also have to be

1 redacted in consequence if anyone says anything that  
 2 they should not.  
 3 Five minutes.  
 4 (11.48 am)  
 5 (Short Break)  
 6 (11.58 am)  
 7 MR RIDYARD: So we are now going to move on to a different  
 8 but in some ways very related aspect of the market  
 9 definition and that is between the different generations  
 10 of chipsets, as opposed to the UMTS/CDMA distinction.  
 11 Maybe, Mr Noble, we could ask you first of all. We  
 12 understand that we have different price levels for the  
 13 chipset of different generations. What role does that  
 14 play in the SSNIP test analysis?  
 15 MR NOBLE: Well, I think it is consistent with the idea that  
 16 they might be separate products, in the sense that they  
 17 are materially different prices for different things  
 18 essentially, and so it sends a signal about the fact  
 19 that these might be separate from one another,  
 20 particularly at the transition period, because there is  
 21 a very substantial price difference between a 4G chipset  
 22 and a 5G chipset, and that is important, I think,  
 23 particularly, because there are some comments, I think,  
 24 in the Qualcomm Defence that suggest that the data  
 25 performance, for example, of 4G and 5G at that point are

1 not as far apart as they then become.  
 2 So, in a sense, it may be that actually the --- there  
 3 is a question mark about the qualities, as it were, but  
 4 you do see a very substantial price --- it is 80%,  
 5 I think, the price difference.  
 6 MR RIDYARD: So it is indicative of differentiation at least  
 7 which itself might be indicative of a lack of closeness,  
 8 as it were?  
 9 MR NOBLE: Precisely, but on its own it is not definitive.  
 10 It needs to be considered in the round with the other  
 11 evidence.  
 12 MR RIDYARD: Dr Padilla, do you agree with that?  
 13 DR PADILLA: Yes and no. Let me clarify. I think that of  
 14 course if there is a difference in chipset prices, you  
 15 would think that, you know, may indicate --- it does not  
 16 corroborate, but it may indicate separate markets, but  
 17 I think it is important that we focus attention to the  
 18 points in time where I am alleging that there was  
 19 substitution across generations, because those are  
 20 limited. If you go to table 1 in my fourth report, you  
 21 will see that I am talking basically about  
 22 four years, 2011 and 2012, between ---  
 23 MR RIDYARD: Can you give me a page number on that?  
 24 DR PADILLA: Yes, page 60 of the fourth report, table 1,  
 25 paragraph 191.

1 MR RIDYARD: Your page 60, yes.  
 2 DR PADILLA: You can see that substitution across generation  
 3 happens in 2011/2012 by and large and then in 2019  
 4 and 2020. Those are transition periods. 2019/20, for  
 5 example, is the period in time in which Samsung was  
 6 competing with 5G phones and Apple was not competing  
 7 with a 5G phone.  
 8 The existence of price differences at this point in  
 9 time is not surprising and to a large extent reflects  
 10 the fact that I mentioned before, that chipset prices  
 11 tend to go down over the lifecycle. These are going to  
 12 be --- this is the end for, say, 4G or 3G at the  
 13 different points and the beginning for 4G and 5G  
 14 respectively.  
 15 MR RIDYARD: Your mechanism for --- I asked the question  
 16 earlier : what is the mechanism for the SSNIP test to  
 17 work as between the UMTS and CDMA. It is a similar  
 18 mechanism here, is it, that the --- even though as an OEM  
 19 I do want to transition towards, you know, 5G over 4G or  
 20 4G over 3G and I know it is going to happen in the next  
 21 few years, I have discretion about how quickly I  
 22 transition and the price difference between the chipsets  
 23 will condition how quickly I make that transition and  
 24 I have discretion and choice over that, so that is the  
 25 choice area which you think is --- provides a constraint

1 from one to the other in principle .  
 2 DR PADILLA: Correct.  
 3 MR RIDYARD: That is the principle. You then have to try to  
 4 measure it against some evidence.  
 5 Mr Noble, do you agree with that as a mechanism and  
 6 is that what we are arguing about here?  
 7 MR NOBLE: I think the mechanism is agreed, in the sense  
 8 that in the way that we are conceptualising it, the  
 9 first --- the person making the choice --- the entity  
 10 making the choice is an OEM, about what chipset to buy  
 11 and what handset to market, but they are doing that  
 12 obviously in the context of other OEMs making similar  
 13 choices and they are doing it in the context of consumer  
 14 demand and so in a sense the discretion that they have,  
 15 I think, is --- one needs to see that in the context of  
 16 those constraints, that if other OEMs are launching  
 17 flagship phones with the new generation, then it may be  
 18 that you do need to buy these products.  
 19 You need to buy at least some of them and there is  
 20 then a question about, well, if you are going to buy  
 21 them and sell some of them, the question is: who is  
 22 really then in control of how many get sold? Because  
 23 I do not think it is quite right to think of the OEM as  
 24 having a magic lever about deciding I shall sell  
 25 1 million 5G and 1 million 4G. In a sense, it is the

1 other way round. They launch a phone and then the  
 2 consumer demand to a large extent determines, well, is  
 3 it 500,000 or is it 1 million that you sell in  
 4 a particular quarter? You obviously then seek to try  
 5 and meet that.  
 6 MR RIDYARD: The demand depends on the OEMs' prices and  
 7 quality choices?  
 8 MR NOBLE: Yes, precisely.  
 9 MR RIDYARD: So can be manipulated in that way.  
 10 One thing which I thought was quite useful here was  
 11 I think it is in Mr Noble's report, where you showed for  
 12 both Samsung and Apple the kind of profile of how  
 13 quickly they switched from one generation to another.  
 14 Do you know, Mr Noble, offhand where that --- I think ---  
 15 MR NOBLE: I think you might be referring to the eighth  
 16 report on page 13, which I think is {POE/21/17}.  
 17 MR RIDYARD: So this is ---  
 18 MR NOBLE: Is this the one you had in mind?  
 19 MR RIDYARD: I had in mind the specific ones for Apple  
 20 and --- this is Apple, is it?  
 21 MR NOBLE: This is Apple.  
 22 MR RIDYARD: Right, okay.  
 23 So the --- then I think for Samsung the pattern was  
 24 quite --- we do not --- the pattern was quite different,  
 25 was it not? It was more --- from what I recall, for

1 Apple it is a quicker changeover than for Samsung?  
 2 MR NOBLE: Yes, that is my recollection. I do not know  
 3 where the equivalent Samsung one is offhand, but ...  
 4 MR RIDYARD: A few pages further on, I guess.  
 5 DR PADILLA: You will get similar information, if I may, not  
 6 exactly identical, but similar information if you look  
 7 at figures 3 and 4 of my fourth report. That is not  
 8 about chipset supply.  
 9 MR BAILEY: In case it assists, I wonder if Mr Ridyard has  
 10 in mind, as Dr Padilla referred, to figure 3 and 4,  
 11 {POE/22/57}. That may be what you are considering, sir.  
 12 MR RIDYARD: It was Dr Padilla's report. There is similar  
 13 information in both places, but I guess I just found the  
 14 pictures to be easy to see because there indeed you do  
 15 see that transition .  
 16 I mean, for Apple, it is when the transition  
 17 happened, it is pretty rapid. I mean, Dr Padilla, what  
 18 do you make of that? One interpretation that Mr Noble  
 19 would make of that is that it just shows, okay, they  
 20 have some discretion, but essentially once this new  
 21 thing happens, Apple goes all in for the new generation,  
 22 which is sort of consistent with what you might expect  
 23 from a premium brand like Apple, and therefore the  
 24 discretion that you are relying on is --- it exists, but  
 25 it is quite limited in terms of time and maybe the

1 levers that they have open to them.  
 2 DR PADILLA: Indeed and we do not disagree on that, and if  
 3 you look at, again, table 1 that we were looking at  
 4 before, you would find that in 2021, which is the timing  
 5 which you saw this discrete jump in Apple, you know, my  
 6 analysis does not suggest that there is a wide across  
 7 generations. It just looks at 5G in isolation.

8 So when that happens, when the possibility of  
 9 substitution is so limited, I take it into account. It  
 10 is 2020 — 2019 and 2020, which is an important period  
 11 for the discussion that we will have in due course about  
 12 conduct because of the Apple 2019 agreement that the  
 13 discretion existed and there Apple had a discretion to  
 14 push forward or backwards the day which it was going to  
 15 compel its customers to switch from 4G to 5G.

16 MR RIDYARD: Mr Noble.

17 MR NOBLE: Well, I think it is useful to think about —  
 18 I mean, it goes back to the point I was making before  
 19 about in a sense who is really in the driving seat here.  
 20 Is it the OEM in the driving seat deciding what it is  
 21 that the consumer is going to have or is it that the  
 22 consumer is in the driving seat, deciding what they are  
 23 going to have? As you say, Apple is a premium brand and  
 24 I think there is a lot of evidence that appears  
 25 consistent with the position that they felt they had to

61

1 adopt this standard relatively quickly and when they do,  
 2 as we see in the data, the transition is very rapid from  
 3 one to the other.

4 I think with Samsung, one can think of them as  
 5 accessing different pools of demand, that they have  
 6 a premium offering of phones which arguably is competing  
 7 most vigorously with Apple, things like the Samsung S20,  
 8 and then they have other phones as well, which are  
 9 arguably accessing different pools of demand. I think  
 10 we are going to come on to talk about the CMA market —  
 11 the ecosystem market study. I mean, that highlights  
 12 that there are these sort of, you know, mid and low  
 13 tiers which Apple really is not focusing on and so if  
 14 one thinks of them as these different pools of demand,  
 15 then it may well be that actually the low tier — there  
 16 is not a willingness to pay for whatever it is, \$60 more  
 17 in cost, plus potentially margin, etc, for a phone to  
 18 get 5G and therefore consumers do not want it in a sense  
 19 at that stage.

20 So I think we really have to think of it in that  
 21 way, that ultimately who is paying for this technology?  
 22 I would suggest ultimately it will be the consumer.  
 23 There is very likely to be some degree of pass-on here  
 24 and, therefore, there is a cost difference and therefore  
 25 a price difference and therefore the question is how

62

1 substitutable do customers see the 4G and the 5G  
 2 ultimately?

3 MR RIDYARD: But do you think that the different patterns  
 4 between Apple and Samsung that you just described, does  
 5 that give Samsung greater discretion about how it  
 6 switches or how quickly it switches or in what  
 7 proportions it switches from one G to another G in its  
 8 chipsets?

9 MR NOBLE: I think there are two distinct questions. There  
 10 is a sort of threshold question of are you in the 5G  
 11 game or are you not? I think the evidence, as I read  
 12 it, is Samsung does appear to have acted in a way that  
 13 was a threshold question for it. You know, it was the  
 14 world's first commercially launched 5G handset. That is  
 15 consistent with someone that wants to be —

16 MR RIDYARD: Let us assume that everyone wants to be in the  
 17 new generation.

18 MR NOBLE: In that sense, that it is a must-have, they do  
 19 need to buy some. So the question then is, okay,  
 20 because you have in a sense a must-have product, how  
 21 elastic, how substitutable is it at the margin to say,  
 22 well, I have to have some of these, but maybe I do not  
 23 have to have so many? I think, again, that comes back  
 24 to this consumer point of you are offering products to  
 25 the consumer, are the consumers going to be willing to

63

1 pay extra for this more expensive — substantially more  
 2 expensive — this is not a marginal — you know, even on  
 3 a \$500 or \$600 phone, we are talking 10%, 15%, 20% more  
 4 potentially for a 5G-enabled model, versus a 4G-enabled  
 5 model because of the delta in the chipset price.

6 MR RIDYARD: But you could adjust other aspects of your  
 7 phone to compensate for those differences, could you  
 8 not?

9 MR NOBLE: You could. You could, but I think my  
 10 understanding of the facts is that Samsung offered very  
 11 similar phones with and without 5G. So they — and  
 12 there was then a price difference between the two and so  
 13 I think conceptually you could be offering a sort of 5G  
 14 phone but with fewer whistles and bells on it, but,  
 15 again, I think that comes back to almost how do we  
 16 conceive of the demand here? Because if we think that  
 17 the people at least initially in the transition period  
 18 are the earlier adopters with the highest willingness to  
 19 pay, then it does seem slightly incongruous that they  
 20 are willing to pay to adopt a very fast mobile standard  
 21 but they want to view that HD video on a less good  
 22 screen than they otherwise would have done.

23 THE CHAIR: So is there a real difference between Apple and  
 24 Samsung here because of their different business models?  
 25 You have Apple, who brings out a product once a year,

64

1 and therefore that product has to be the latest  
 2 standard, and Samsung, who brings out a lot of products,  
 3 and what does that tell you about the market definition?  
 4 MR NOBLE: Well, I would not want to over—emphasise the  
 5 difference between the two because Apple, yes, they do  
 6 tend to bring out generations in a single launch event,  
 7 once per year, but Apple has tried all sorts of  
 8 different arrangements. It has launched more than one  
 9 phone at a time. It has launched multiple tiers of  
 10 phone. Different sizes. Different qualities. It has  
 11 the SE range which is a sort of slightly trimmed down  
 12 set of qualities associated with that.

13 Apple also tends to sell phones. It does not just  
 14 sell the latest model. It sells last year's model and  
 15 even sometimes the year before that simultaneously. So  
 16 it may have a small number that it launches per year,  
 17 but it does have a tail of phones and therefore both  
 18 operators do have a range. It is certainly true that  
 19 Samsung has a much wider range of phones, but, as I say,  
 20 part of that is driven by the fact that it operates —  
 21 some of its phones are at very different price points.  
 22 They are at \$100 or \$200. Some of them — well, until  
 23 recently, they were not even what you would call  
 24 smartphones. They were feature phones that in a sense  
 25 they are very different.

1 MR RIDYARD: Dr Padilla.  
 2 DR PADILLA: A couple of points. One is a factual point.  
 3 I think my understanding is that actually Apple tends to  
 4 lag behind others in the introduction of new standards,  
 5 instead of leading.  
 6 The point here is what are the dimensions of  
 7 substitution for Apple and for Samsung? Samsung decided  
 8 to release 5G sooner, but it had — but it did it  
 9 in small numbers and with a product portfolio that also  
 10 included 4G. So there is the flexibility that it had  
 11 when negotiating chipset prices is that it could change  
 12 the product mix.  
 13 In the case of Apple, Apple tends to, contrary to  
 14 what my colleague Mr Noble says, to some extent guide  
 15 demand and not just follow demand and when it launches  
 16 a new generation, it tends to phase out the existing  
 17 one.  
 18 The dimension of flexibility was the timing.  
 19 2019/ 2020, I think that time flies, but 5G was starting  
 20 at that point. The number of 5G networks in the world  
 21 was fairly limited. In fact, even the true 5G in many  
 22 places in Europe is still —  
 23 THE CHAIR: I understand your point. Your point is that the  
 24 dimension of flexibility is different, but in both cases  
 25 you say that there was flexibility; Samsung by changing

1 in the product mix, Apple by changing the timing.  
 2 DR PADILLA: Correct.  
 3 MR RIDYARD: I just wanted to quickly check on what you are  
 4 saying about Apple — the distinction between Apple and  
 5 its ownership of the iOS system compared to Samsung  
 6 which, as you said earlier, is obviously Android and  
 7 therefore competes with other Androids. Does that make  
 8 a difference to any of this?  
 9 DR PADILLA: Not really, because I do not think any of us is  
 10 defining or, you know, in any way arguing for separate  
 11 markets, iOS or Android.  
 12 MR RIDYARD: No. But you did suggest that you thought Apple  
 13 had less — faced less intense competition than others.  
 14 DR PADILLA: It is likely to and I think that that is  
 15 an issue that is being debated constantly, to what  
 16 extent the price premium would support — and the  
 17 existence of switching costs would support separate  
 18 markets, but I think that, as far as I can think of now,  
 19 for the purposes of the discussion in this case, I do  
 20 not think that that is material.  
 21 MR RIDYARD: That is useful.  
 22 MR NOBLE: Just one reference that might provide — find of  
 23 assistance, which is from the CMA mobile ecosystems  
 24 market study. It is paragraph 376. It says:  
 25 "We have not received substantive evidence [the "we"

1 being the CMA] to show that there is a quality  
 2 difference between iOS devices and Android devices at  
 3 comparable price points."  
 4 So ...  
 5 MR RIDYARD: Okay. That is useful.  
 6 Then if we can just turn to the sort of analogous  
 7 question to the one I asked earlier, which is about  
 8 Dr Padilla's price overlaps analysis. The things you  
 9 were saying about the price overlap analysis between  
 10 CDMA and UMTS phones, I mean, it is sort of the same  
 11 concept that has been used in your comparison of prices  
 12 between the different generations of phones.  
 13 MR NOBLE: Absolutely.  
 14 MR RIDYARD: Is there anything more to say on that or is  
 15 there any difference in the pros and cons of that piece  
 16 of analysis?  
 17 MR NOBLE: I think the pros and cons are, in a sense,  
 18 similar, whether you are looking, you know, between 4G,  
 19 5G, 3G 4G.  
 20 MR RIDYARD: I am talking about Dr Padilla's price overlap  
 21 analysis, where he — I mean, he has used essentially  
 22 the same argument and the same analysis, but —  
 23 MR NOBLE: Yes, that is what I meant because I think  
 24 actually the way — Dr Padilla will correct me if  
 25 I misstate this — the way I understood his actual —

1 the spreadsheets to work is that it is all the  
 2 spreadsheet, it is all the same analysis, it is that,  
 3 you know ---  
 4 MR RIDYARD: Of course, yes, he does not do the two  
 5 separately.  
 6 MR NOBLE: Yes, exactly.  
 7 DR PADILLA: The only thing I would point out is that, if  
 8 anything, the reference to the CMA report that Mr Noble  
 9 has just, you know, discussed is very relevant because  
 10 it suggests that the CMA considers that there is  
 11 substitution at the price point.  
 12 MR RIDYARD: Well, okay, yes, possibly. We need to look a  
 13 bit more closely at everything they said there, which  
 14 I must confess I have not yet done.  
 15 Okay. We talked about --- in the beginning about  
 16 what relevance does price differences in the chipsets of  
 17 different generations have. Is there any evidence of ---  
 18 obviously to do a kind of SSNIP test analysis, one does  
 19 not so much price differences although I understand they  
 20 may be relevant, but changes in relative prices over  
 21 time. Is there anything there that we could have used,  
 22 because I think in one of your exhibits, Mr Noble, you  
 23 showed a sort of --- what appeared to be a little spike  
 24 in the 5G prices and I just wondered whether that threw  
 25 up any interesting kind of natural experiment, as it

1 were, to see how the market responded to that price  
 2 change?  
 3 MR NOBLE: Are you perhaps referring to figure 2.3 of my  
 4 eighth report, which I think is {POE/21/20}? Is that ---  
 5 MR RIDYARD: Yes, probably.  
 6 MR NOBLE: Is it that spike on the right-hand side?  
 7 MR RIDYARD: Yes, indeed.  
 8 MR NOBLE: No, I have not been able to analyse that. We  
 9 have not --- no.  
 10 MR RIDYARD: So there is nothing --- I mean, obviously we can  
 11 only work with the evidence that we have and that  
 12 includes you as well, but there is nothing we can do  
 13 here to sort of convert that into an interesting natural  
 14 experiment that we could analyse?  
 15 MR NOBLE: I mean, I think one could try and look. I think  
 16 the question mark that --- before we get too excited  
 17 about the spike, is I think, I mean, this chart is,  
 18 I think, an average. Who is this? I think this is ---  
 19 DR PADILLA: If I may, because I think this would save time.  
 20 If you look at the period where the spike takes place,  
 21 I think there is agreement between Mr Noble and I that  
 22 there is a 5G-only market.  
 23 MR RIDYARD: Yes, indeed, so it does not help.  
 24 DR PADILLA: It does not help us. The spike would have to  
 25 be in 2019/2020 for that to make a difference.

1 MR RIDYARD: I will have to reign back my excitement in that  
 2 case.  
 3 I think that covers everything we can usefully talk  
 4 through on the 3G, 4G, 5G analysis.  
 5 I wanted to move on to this question of quality  
 6 differentiation within the chipset industry because,  
 7 I mean, this issue seems to come up time after time when  
 8 we start getting into the sort of --- the nuts and bolts  
 9 of the alleged abuse. I mean, clearly, you know, there  
 10 is quality differentiation between the different  
 11 chipsets and they are complicated products and some  
 12 people are doing it better than others, but you have  
 13 both taken the view that at least within a particular  
 14 category of chipsets, you know, 3G UMTS chipsets,  
 15 whatever, that all the offerings in the market are in  
 16 the same market. There is not a separate market for  
 17 sort of high-end as opposed to low-end chipsets. Is  
 18 that your position, Mr Noble?  
 19 MR NOBLE: Yes.  
 20 MR RIDYARD: So what does that --- so that means that it  
 21 would not be possible for someone who was,  
 22 hypothetically, a monopolist on high-end chipsets in  
 23 that category to impose a unilateral price rise above  
 24 the competitive level?  
 25 MR NOBLE: Yes. I mean, the logic flow is that we have

1 a range of qualities and that if there is a hypothetical  
 2 monopolist for the high-quality chips, they try and  
 3 raise the price and, you know, because I am looking at  
 4 the market-wide level, there is sufficient substitution  
 5 to the next rung in the quality ladder, which is the  
 6 thing that they do not control, to constrain that and so  
 7 on and so on. So it is a chain of substitution.  
 8 MR RIDYARD: On the demand side?  
 9 MR NOBLE: On the demand side, yes.  
 10 MR RIDYARD: Dr Padilla, presumably you are in agreement  
 11 with that?  
 12 DR PADILLA: I agree.  
 13 MR NOBLE: I think also --- I mean, the evidence is a bit  
 14 more mixed the other way round on the supply-side  
 15 substitution. I think at various times it may have been  
 16 possible that there was also supply-side substitution,  
 17 but I think one of the reasons we talk about the quality  
 18 differentiation is I think there is a question mark  
 19 about the extent to which there is an ability for  
 20 suppliers to alter which qualities they are offering.  
 21 MR RIDYARD: Yes. You do not need both demand and supply to  
 22 get you home on the conclusion that you reached on  
 23 market definition.  
 24 So this, in some ways, is kind of jumping ahead and  
 25 we will deal with this maybe in more detail when we get

1 to the specifics of the dominance and so forth and  
2 indeed the abuse allegations, but how does that impact  
3 the sort of leverage that Qualcomm might be able to  
4 exert over OEMs? Mr Noble, maybe you should start on  
5 that.

6 MR NOBLE: Well, I think the way I think about market  
7 definition, as we said at the beginning, is it is not  
8 the be-all and end-all of a case. It is the starting  
9 point. It is an analytical tool and I think it is  
10 important to recognise, what we are not doing here is  
11 defining kind of a homogeneous "good market" and so  
12 I think --- Dr Padilla will no doubt speak for himself,  
13 but I think we are both agreed there are different  
14 qualities. It is an important feature of the market  
15 that there are those different qualities. It is very  
16 hard to draw lines in the sand between those different  
17 qualities and a lot of the ways that you might do that  
18 are circular. You know, a high-quality chipset is  
19 the thing that goes in a high-quality phone. Well, that  
20 is largely circular logic. But I do think it matters to  
21 recognise, you know, at various stages in the analysis,  
22 that there is a quality differentiator and there is  
23 a couple of ways that that makes itself known.

24 One is when I think when we come, I think on the  
25 next section, to talk about market shares, I think it

1 tells you something about whether you should be focusing  
2 on volume or revenue market shares and then I think it  
3 also --- it is an important contour of that market when  
4 you are thinking about individual interactions within  
5 those relevant markets.

6 MR RIDYARD: But looking at a very specific one. I mean,  
7 there is an issue at some point about whether, you know,  
8 say, Apple could credibly switch to the MediaTek chip  
9 instead of a Qualcomm chip, when Qualcomm chips are no  
10 doubt rightly perceived as being high quality and  
11 MediaTek ones as being of a less high quality and the  
12 argument is made, well, they could not credibly make  
13 that switch because of the phones they want to make. So  
14 how does that kind of proposition stack up against the  
15 conclusion that you reached about the MediaTek and the  
16 Qualcomm chipsets being in the same market, being  
17 effective substitutes for one another?

18 MR NOBLE: Well, I think it comes back to the question that  
19 if one is looking at the market-wide level across all  
20 OEMs, then some of the substitution does not have to  
21 involve all OEMs. You can have elastic OEMs in the  
22 middle that are willing to make that kind of  
23 substitution and you can have less elastic OEMs that are  
24 less willing or unwilling to make that kind of  
25 substitution. It can then still result in the fact that

1 when you are looking at this at the market-wide level,  
2 that in a sense it is very difficult to then draw  
3 lines in the sand that say there is a higher quality  
4 market and a lower quality market, but I do not think  
5 that is inconsistent with the notion that there can be  
6 individual players that might be less willing to make  
7 such substitution and other ones that will be more  
8 willing to make such a substitution.

9 DR PADILLA: That would contradict the existence of OEM  
10 agnostic markets, I think, but I think that the point  
11 I would like to clarify here --- and I think it has come  
12 across in a number of questions and answers in  
13 previous days --- is whether an input supplier, chipset  
14 supplier, is indispensable because its customer wants to  
15 design a particular product and sell a particular  
16 product. I fundamentally disagree with that, because if  
17 that were the case, then each of us would be an  
18 indispensable input supplier because somebody decides  
19 that it wants to go with Mr Noble or wants to go with  
20 Dr Padilla.

21 I think that the question is whether we are  
22 reasonable substitutes. So Apple wanted a particular  
23 specification. That was self-imposed. If the price of  
24 the chipset --- the high quality chipset is very high,  
25 then they could have switched to MediaTek who provides

1 lower quality but are competitive and tried to  
2 compensate in other dimensions and they do this all the  
3 time. To the best of my understanding Apple, as of  
4 today, does not sell foldable phones. Samsung sells  
5 foldable phones. It is a choice. Would that mean that  
6 the provider of the glass for foldable phones becomes an  
7 indispensable trading partner vis-à-vis Apple because  
8 Apple decides suddenly it wants to do that? That is why  
9 I think the market that we are defining broadly  
10 indicates that there are options and that is why I think  
11 that it is very relevant for all that discussion that  
12 you were referring to.

13 MR RIDYARD: Mr Noble, any come-back on that?

14 MR NOBLE: Well, I think part of this also comes back to,  
15 you know, the extent to which you think there is  
16 a supply-side substitution, because I think one of the  
17 reasons that Dr Padilla and I arrive at similar  
18 markets --- part of it is demand-side substitution, but  
19 part of it is supply-side substitution as well.

20 MR RIDYARD: Surely, let us take the MediaTek/Qualcomm thing  
21 and this may be a very unfair kind of characterisation,  
22 but let us say Qualcomm are good and MediaTek are bad,  
23 but still okay, I mean, MediaTek cannot just suddenly  
24 think, "I would like to be more like Qualcomm". It is  
25 difficult to do that.

1 MR NOBLE: Yes.  
 2 MR RIDYARD: So there is no supply—side substitution there,  
 3 is there?  
 4 MR NOBLE: Well, I think at different points in time,  
 5 I think Dr Padilla and I agree there is more or less of  
 6 it. I think in some of the later periods of 4G LTE  
 7 there do appear to be — you know, the ability for  
 8 people to offer high—quality chipsets seems to go up,  
 9 which is what you would expect as people innovate. So  
 10 I think, again, it depends quite which time period we  
 11 are talking about. I think in the earlier time periods,  
 12 particularly when MediaTek is an entrant, I think your  
 13 characterisation is more fair.  
 14 DR PADILLA: But I do not think that we agreed or disagreed  
 15 that different qualities were part of the same market,  
 16 because of supply—side substitution or demand—side  
 17 substitution. I think that actually we did not — I do  
 18 not think that we said anything on that. I think that  
 19 my view about supply—side substitution is that it needs  
 20 to be always taken with a pinch of salt, in that there  
 21 is this famous statement by somebody from the  
 22 Commission, I do not remember now, saying: you know, we  
 23 used supply—side substitution for market definition when  
 24 it makes no difference, which means, you know, you have  
 25 to be very, very cautious.

1 I think that there is demand—side substitution here  
 2 and I think that that is what drives the market and  
 3 everything that I said before applies.  
 4 MR RIDYARD: Okay.  
 5 I think that takes us to the end of the section on  
 6 market definition. I think we said to the parties that  
 7 there will be a chance for the advocates to raise just  
 8 questions of clarification at the end of each section.  
 9 MR MOSER: We do not have any.  
 10 MR SAUNDERS: Nor us.  
 11 MR RIDYARD: Perfect clarity. Excellent.  
 12 Right. So we will move on to the second topic,  
 13 which is the question of dominance. Our first subtopic  
 14 on that is just looking at market shares. The parties  
 15 have very helpfully both provided your summary market  
 16 share numbers. I guess the first question — maybe  
 17 Dr Padilla — is there any important difference  
 18 between — obviously you look at the market in different  
 19 ways, I understand that, but is there any difference  
 20 between you on the actual numbers that you are using?  
 21 DR PADILLA: Market shares are high under both definitions  
 22 and so the discussion about dominance is fundamentally  
 23 about other dimensions than market shares.  
 24 MR RIDYARD: But there was nothing in the other side's  
 25 market share numbers that you thought were incorrect?

1 Obviously you look at it in a different way, you say  
 2 they are asking the wrong question, but the answers they  
 3 have given are okay as far as you are concerned?  
 4 DR PADILLA: If any arithmetical error, I would have flagged  
 5 during our discussions in the joint expert statement.  
 6 MR RIDYARD: Mr Noble, are you the same?  
 7 MR NOBLE: We did not detect any arithmetical errors.  
 8 MR RIDYARD: Okay.  
 9 So then, I mean, Dr Padilla, you just said some of  
 10 the market shares are high. Clearly that is the case.  
 11 So then there is a question about what use we make of  
 12 market shares in an industry such as this. I think you  
 13 make the statement that — you have already just said it  
 14 really just now — market shares do not provide  
 15 a reliable indicator of market power, in an industry  
 16 such as this. I am not surprised to hear you make that  
 17 argument, but what does it mean? What is it  
 18 specifically about this industry that causes you to  
 19 reach that conclusion?  
 20 DR PADILLA: So on the one hand I think that there is the  
 21 bidding market dimension that we were discussing before.  
 22 If you look at market shares, they are driven by the  
 23 evolution over time and the numbers are driven by this  
 24 competition for slots that we were discussing before.  
 25 You know, when Apple decides to go with Qualcomm, then

1 Qualcomm's market share jumps tremendously. Does that  
 2 mean that Qualcomm has a lot of market power or does  
 3 that mean that Apple had a lot of buyer power and made  
 4 a decision to purchase from Qualcomm as opposed to from  
 5 somebody else?  
 6 So I think that that is one characteristic that is  
 7 important.  
 8 The second characteristic is that when we are  
 9 measuring market shares, whether in volume or in value,  
 10 which I do not think that it makes a difference in this  
 11 case, we are looking at volume — sorry, at market  
 12 shares in the market. We are not looking at capacity in  
 13 market shares. That may have an impact. You know, when  
 14 we say Qualcomm has X% of the market, MediaTek has X% of  
 15 the market, we are looking at the volumes that were  
 16 transacted or the value of the volumes that were  
 17 transacted, not the capacity to serve the market.  
 18 Capacity here is actually fairly unlimited, not really  
 19 constrained because we are talking about fabless chipset  
 20 sellers, which means that if Apple had decided not to go  
 21 with Qualcomm but had decided to go with MediaTek,  
 22 MediaTek most likely would have been able to serve that  
 23 demand and then the very high market share would be on  
 24 MediaTek.  
 25 So —

1 MR RIDYARD: Sorry to interrupt. We do not really know  
 2 anything about the fabs. Someone is making these things  
 3 somewhere. We do not know anything about the fabs'  
 4 capacity, do we?  
 5 DR PADILLA: So we are talking about TSMC and Global  
 6 Foundries, basically. These are the two companies that  
 7 produce those and, look, if the volumes that TSMC was  
 8 going to manufacture for Apple go to MediaTek ---  
 9 MR RIDYARD: That is just moving the same numbers around.  
 10 DR PADILLA: --- and therefore if it had capacity for Apple,  
 11 it had capacity for MediaTek.  
 12 THE CHAIR: So the same foundries are making the chips for  
 13 both?  
 14 DR PADILLA: To the best of my understanding, yes.  
 15 MR RIDYARD: That was a bit of a digression, but useful.  
 16 Sorry, just before we move to Mr Noble, Dr Padilla,  
 17 so the features that --- the specific features about this  
 18 industry that mean we should not be worried about or  
 19 should not be interested in market share or we should  
 20 not be unduly influenced by market shares or what  
 21 exactly?  
 22 DR PADILLA: So the bidding characteristic, which means that  
 23 you are going to observe very significant fluctuations  
 24 that are driven by demand decisions as opposed to  
 25 capacity constraints or product differentiation and,

1 secondly, as I mentioned, the fact that there is the  
 2 ability to expand for existing players their volumes  
 3 significantly in response demand decisions.  
 4 MR RIDYARD: Right. Mr Noble, your response on that because  
 5 I think you expressed, obviously, the contrary view  
 6 which is that this is not an industry where we should  
 7 disregard market shares.  
 8 MR NOBLE: Yes. I mean, I think market shares are useful.  
 9 I think one should see them in their context in all  
 10 cases and not simply just take them as read, but I think  
 11 there are two things to note here.  
 12 One is that they are high and the other is that they  
 13 are persistently high and so if they were high but in  
 14 aggregate fluctuated very substantially, then I think  
 15 that might tell you one thing, but that is generally not  
 16 what we see. What we see is that Qualcomm's market  
 17 share is high at all times, or most times. I think,  
 18 I mean, I do agree with Dr Padilla about the ability to  
 19 expand. There may have been time periods that there  
 20 were restrictions. I think during the coronavirus  
 21 pandemic, for example, I do think there were some  
 22 challenges. I think some of the lead times on some of  
 23 these fabs became very, very long so I do not think it  
 24 is quite right that it is always sort of complete  
 25 flexibility on capacity, but I do not --- but I guess

1 what I think is not disputed is that it is --- the  
 2 chipset makers are all fabless and therefore they are  
 3 all outsourcing their manufacturing in some way, shape  
 4 or form and they do all seem to be calling on a common  
 5 pool of fabs to make those chipsets and so, as  
 6 Dr Padilla said, if one fab is not --- you know, was  
 7 making Apple one day, it might make Samsung the next.  
 8 DR PADILLA: If I may, I would like to disagree with my  
 9 colleague about persistency and, sorry, I do not have  
 10 the reference to the file, but I would like to take you  
 11 to figures 5 and 6 in my fourth report, if at all  
 12 possible, pages 75 and 76 respectively.  
 13 MR BAILEY: It is at {POE/22/78}.  
 14 MR RIDYARD: It is useful to look at these. What do we see?  
 15 DR PADILLA: There you see in the red lines what you have is  
 16 Qualcomm's share of all customers for the products that,  
 17 you know, I consider part of the market --- the Apple  
 18 market. The blue line would be Qualcomm's share of  
 19 Apple's chipset purchases.  
 20 MR RIDYARD: Yes.  
 21 DR PADILLA: So the blue line gives you what Apple bought  
 22 from Qualcomm, what is the share of its chipsets that it  
 23 acquired from Qualcomm. The red line is telling you  
 24 actually it could have bought from others and if it had  
 25 bought in proportion to the market, that would have been

1 Qualcomm's market share.  
 2 This red line actually overestimates or  
 3 underestimates the competitive constraint because it  
 4 does not take into account this fabless dimension that  
 5 we were mentioning before, meaning that MediaTek and  
 6 others could have produced more, but I think that the  
 7 point I want to make here is that there is no  
 8 persistency and you can see how --- if you go to the next  
 9 figure, perhaps, even more clearly, you can see how  
 10 {POE/22/79}, the decisions of Apple contribute to  
 11 Qualcomm's market share. Here, in blue, you have  
 12 Qualcomm sales to other OEMs and then you have, in red,  
 13 Qualcomm's shares to Apple. You can see that, absent  
 14 Apple's purchasing decisions, there is a downward trend  
 15 in the blue line and it is when Apple decides to go for  
 16 Qualcomm that Qualcomm's shares jump up quite  
 17 significantly.  
 18 So I am not saying the market shares are irrelevant  
 19 or provide no information, but I think that we always  
 20 have to distinguish whether the market share is telling  
 21 me who is best or whether they are telling me that  
 22 somebody has market power. I believe that Apple was  
 23 choosing Qualcomm because it was best and that  
 24 Qualcomm's market share was high because it was the best  
 25 option, but that does not mean that it had market power

1 because Apple could have made different decisions in  
 2 a market where substitution possibilities exist and then  
 3 market shares would have been completely different.  
 4 MR RIDYARD: Well, okay. Mr Noble.  
 5 MR NOBLE: Well, I wonder if it is possible to look at the  
 6 Class Representative's market share table because of  
 7 course this is calculated on Dr Padilla's market? I do  
 8 not know --- I do not actually have that reference to  
 9 hand.  
 10 MR WILLIAMS: Do you mean this week's note or do you mean  
 11 the report?  
 12 MR NOBLE: Yes.  
 13 MR RIDYARD: While we are waiting on that, Dr Padilla, on  
 14 your red and blue lines, I mean, the blue one was  
 15 jumping around sort of zero to 100 for Apple, but that  
 16 is not your description of the market, is it? That is  
 17 just Apple's purchases within the relevant market, as  
 18 you have defined it?  
 19 DR PADILLA: Yes, correct.  
 20 MR RIDYARD: Yes. It is in your eighth report, is it,  
 21 Mr Noble?  
 22 MR NOBLE: No, this is the Class Representative's note that  
 23 the Tribunal asked for that came, I think, was it,  
 24 Wednesday?  
 25 MR SAUNDERS: It is {X/2.1/1}.

1 THE CHAIR: Can someone provide a copy of that to Mr Noble  
 2 and Dr Padilla {X/2.1/1}. Is it on the screen now?  
 3 MR NOBLE: It is on screen.  
 4 If you go on to the next page {X/2.1/2} and then the  
 5 one after that {X/2.1/3}. Yes, it is this.  
 6 So this provides the revenue market shares on the  
 7 left and then the volume market shares on the right for  
 8 each of the relevant markets that are defined.  
 9 Certainly, as I said, in the way that I have defined the  
 10 market, what I observed from this table is that Qualcomm  
 11 has a very high and a very persistent market share, you  
 12 know, across all those markets.  
 13 DR PADILLA: Well, Mr Noble, if we go to your second column,  
 14 LTE-UMTS-GSM goes down from 100% to 50% in value, or in  
 15 volume, and in value 67%.  
 16 MR NOBLE: Yes, although I would say that ---  
 17 DR PADILLA: I do not think that you or I would like to lose  
 18 that market share and we would be able to defend to our  
 19 shareholders that that was ---  
 20 MR NOBLE: Well, what shareholders care about is the revenue  
 21 and they are still capturing 67% of the value and  
 22 I would say that it is important to note that in these  
 23 tables, some of these are quite --- some of these market  
 24 shares are quite difficult to estimate because a lot of  
 25 the data we have does not distinguish very effectively

1 between UMTS and CDMA chipsets in those two columns. It  
 2 often just elides the two and so, in a sense, it is at  
 3 least 66 and at least 67, for example, in 2017 and 2018  
 4 because we have made assumptions there that Qualcomm has  
 5 100% of the market in CDMA, which obviously it does not,  
 6 but we did not wish to overestimate those numbers.  
 7 MR RIDYARD: I understand that.  
 8 DR PADILLA: But the question here in relation --- in  
 9 comparison with my blue line/red line analysis is, and  
 10 I do not know, Mr Noble, whether you know these figures,  
 11 what would be the market shares if you removed Apple and  
 12 Samsung?  
 13 MR NOBLE: Removed them? I would not know offhand.  
 14 MR RIDYARD: But is that even a valid question to ask  
 15 because if you remove --- I mean, if you remove them,  
 16 what does it mean? I mean, if you remove Apple from the  
 17 face of the earth and see what happens or ---  
 18 DR PADILLA: It is exactly the same point that I made  
 19 before. So I would not say that that would be the right  
 20 market share, but I am trying to interpret whether  
 21 market share is driven by Qualcomm's power or is the  
 22 result of decisions made by consumers and that is the  
 23 bidding market dimension that I mentioned before.  
 24 MR RIDYARD: Yes.  
 25 DR PADILLA: So Apple could --- if Apple could have chosen

1 somebody else, then that market share would have  
 2 migrated immediately, which is very different from  
 3 a situation in which market shares are stable over time  
 4 as a result of an aggregate of various --- many decisions  
 5 of individual players, subject, for example, to  
 6 switching costs, where you can see that is market power,  
 7 but here it is to some extent a decision of a large or  
 8 a couple of large buyers that represent a very  
 9 significant chunk of demand at that point.  
 10 So it is not about a calculation of market share;  
 11 you would be absolutely correct, it is about  
 12 interpretation.  
 13 MR NOBLE: Yes, although I think the caveat that I would  
 14 highlight there is that Apple becomes a large OEM late,  
 15 in the later years. In the earlier years that we are  
 16 talking about here, I mean, they only started making  
 17 a phone in 2007 so they are not a large OEM then. They  
 18 are barely an OEM at all. So Apple does grow and grow  
 19 and grow. It has been a very successful company, but  
 20 I think it is not right to think of Apple as always sat  
 21 there with 30-something per cent market share. You  
 22 know, it may have that now, but it certainly did not  
 23 back in 2010, for example.  
 24 It is similar for Samsung. The market as a whole  
 25 was generally much more fragmented in earlier years than

1 it is in the later years. You know, lots of entities ,  
 2 like , well , Nokia and then it becomes Microsoft Mobile,  
 3 you know, Ericsson, Sony, etc, are all active and we  
 4 heard from BlackBerry and from Lenovo about their  
 5 activity in the market. Many of those players have now  
 6 exited over time.  
 7 MR RIDYARD: I think we have a sense though of the core  
 8 answer to my question about what is it about this that  
 9 you would — where you would say the market shares do  
 10 count and it is really this difference of view about  
 11 persistence. I think that is the core difference  
 12 between you.  
 13 MR NOBLE: Yes, I think that is the essence of it.  
 14 MR RIDYARD: What about something that was touched on  
 15 briefly by Dr Padilla there about the difference between  
 16 value and volume? I think it is your position,  
 17 Mr Noble, that in a differentiated product market, it  
 18 makes best sense to look at value shares. Is that  
 19 something you disagree with, Dr Padilla?  
 20 DR PADILLA: I think that in this case there is an issue  
 21 about the quality of data, but, frankly, I do not think  
 22 that that is material. So I think that I have provided  
 23 numbers with volume, volume market shares, and I have  
 24 provided value market shares.  
 25 MR RIDYARD: But I thought you had a distinct preference for

1 volume shares?  
 2 DR PADILLA: Because of the — as Mr Noble was mentioning,  
 3 calculating market shares is complicated and I think  
 4 that it is easier to do it here with volumes, as opposed  
 5 to with value.  
 6 MR RIDYARD: So just because it is easier, not because it is  
 7 better?  
 8 DR PADILLA: I think that I do not have a strict preference  
 9 for one or the other in this particular instance.  
 10 MR RIDYARD: Mr Noble.  
 11 MR NOBLE: I mean, from my perspective, the easy market  
 12 shares to calculate, in inverted commas, are the 3G CDMA  
 13 and 5G because the datasets we are using, it is  
 14 relatively clear which chipsets are which. The hard  
 15 ones are LTE—UMTS and LTE—CDMA because some of the  
 16 datasets are just not very clear and so you have to make  
 17 these kinds of assumptions. So that affects the extent  
 18 to which one can be sure that you have the right number  
 19 in those particular columns, but I do not think it  
 20 particularly affects the extent to which the value or  
 21 the volume columns are the right ones to look at because  
 22 once you have solved that problem of identifying which  
 23 chipset is which, I do not think there is a lot of lack  
 24 of clarity about what the number is. The numbers are in  
 25 the dataset.

1 I think it is also quite clear from the earlier  
 2 conversations that, you know, potentially it is  
 3 a dispute of fact about whether or not higher prices  
 4 were charged for CDMA, the CDMA adder, for example, but,  
 5 assuming that they were, then I think that, for me, is  
 6 a quite important factor in steering us one way or the  
 7 other because it does suggest that the revenue numbers  
 8 might be capturing both quality differences , which are  
 9 important in a market where we all agree that quality  
 10 matters, but also where there is a question mark about  
 11 does someone have market power and, you know, the  
 12 presence of something like a CDMA adder is consistent  
 13 with that and therefore I prefer a measure that captures  
 14 those factors .  
 15 MR RIDYARD: Yes.  
 16 Let us move on to my next sort of subtopic, which is  
 17 the question of entry areas and constraints on chipset  
 18 pricing. You both talk a fair bit about entry barriers  
 19 and the existence or non—existence of them in your  
 20 reports and in the joint report, but I would like to  
 21 start with a very basic question, which is what is an  
 22 entry barrier because I did not see either of you tell  
 23 me what it was? Maybe I should know by now, but —  
 24 DR PADILLA: That is a very hard question. I will tell you  
 25 what I think, but I think that there is disagreement

1 amongst economists about what this is.  
 2 My view is that we are talking about hurdles that  
 3 the entrant incurs or faces that the incumbent does not  
 4 and, to be more concrete, fixed costs that are incurred  
 5 on a recurring basis, by both incumbent and the entrant,  
 6 are not a barrier to entry. It is part of the cost of  
 7 doing business. Fixed costs or any other sunk costs  
 8 that the incumbent has already incurred and does not  
 9 need to incur again and the entrant faces at the entry  
 10 point, these are entry barriers .  
 11 MR RIDYARD: So it is asymmetry between the incumbent and  
 12 the entrant?  
 13 DR PADILLA: Right. In support of that, I would quote the  
 14 paper of Mankiw & Whinston, RAND Journal of  
 15 Economics 1996, which looks at prices in free entry/free  
 16 exit and the pricing free entry/free exit is, by and  
 17 large, the long—run average incremental cost, which  
 18 means that those fixed costs are part of the free  
 19 entry/free exit scenario and those are fixed costs that  
 20 are incurred both by the incumbent and the entrant.  
 21 MR RIDYARD: Mr Noble, where are you on entry barriers?  
 22 MR NOBLE: I mean, I think for me the critical issue is  
 23 really about the sunkness of them. So are they sunk  
 24 costs? So, I mean, if we go and look, for example, at  
 25 the CMA guidelines, it talks about entry barriers

1 arising where an undertaking has an advantage over  
 2 a potential entrant and I think, in Dr Padilla's  
 3 definition, he highlights the distinction between a sunk  
 4 cost and a non-sunk cost and I think that is often  
 5 a critical distinction between the two because it can  
 6 then create an asymmetry between the incumbent and the  
 7 entrant.  
 8 MR RIDYARD: I think you are agreeing then, are you, with  
 9 your working definitions?  
 10 MR NOBLE: I think so. I mean, I was going to cite  
 11 a different paper, but I do not know if we want to trade  
 12 too many academic references. There is a Baumol &  
 13 Willig paper that is quite interesting on this, but  
 14 I think the sunkness is, I think, in the context of this  
 15 case, the most important aspect of entry barriers.  
 16 DR PADILLA: I would say to clarify my position because  
 17 I think that we are very close but not exactly identical  
 18 in the way that we have formulated. Suppose that  
 19 following entry, so T plus 1, entry happens at T, and T  
 20 plus 1, the entrant and the incumbent are both --- or  
 21 both need to incur in sunk costs, for example  
 22 advertising costs. If there is no asymmetry, that is  
 23 not a barrier to entry. However, if advertising made by  
 24 the incumbent in T minus 1 or T minus 2 has created  
 25 a stock, a brand value, that will create a barrier to

1 entry, provided that that brand value, that stock, you  
 2 know, carries through over time.  
 3 MR RIDYARD: Okay.  
 4 MR NOBLE: I think maybe there is not a gap because I would  
 5 agree with that.  
 6 MR RIDYARD: You agree with that?  
 7 MR NOBLE: Yes.  
 8 MR RIDYARD: All right. We will circle back to that,  
 9 I think, as we go through some of the entry barrier  
 10 headings in the next few questions. Thank you for that.  
 11 THE CHAIR: I just wondered whether, before getting into  
 12 a new question, which might take a little bit of time,  
 13 it would be better to stop now and return at 2 o'clock.  
 14 Thank you.  
 15 (12.58 pm)  
 16 (The luncheon adjournment)  
 17 (2.00 pm)  
 18 MR RIDYARD: We are going to continue talking about entry  
 19 barriers. I want to ask next about the benefits of  
 20 larger scale operation, given that there are some quite  
 21 big differences in the sizes --- or very big differences  
 22 in the sizes of different players.  
 23 Mr Noble, do you consider that scale effects give  
 24 rise to entry barriers in this industry?  
 25 MR NOBLE: Entry barriers for chipset manufacturers?

1 MR RIDYARD: Yes.  
 2 MR NOBLE: Yes. Yes, I think they do.  
 3 MR RIDYARD: How?  
 4 MR NOBLE: Well, I think it is because you have very, very  
 5 large-scales of investment and if we go back to our  
 6 discussion earlier about what is a barrier to entry, the  
 7 fact that something is big on its own is not enough, but  
 8 in this context the evidence that I have seen signals  
 9 that when people are investing in cellular technology,  
 10 or cellular R&D, that is essentially a sunk cost. You  
 11 know, it is specific to cellular and therefore they are  
 12 sinking that cost relative to that industry and there is  
 13 a particularly useful quote --- I think in my eighth  
 14 report --- so it is at {POE/21/43}, and it is in the  
 15 footnote at the bottom. It is the Broadcom quote there.  
 16 I do not think that is confidential. I do not know.  
 17 I will not read I out.  
 18 MR RIDYARD: That is fine. We can look at it.  
 19 MR NOBLE: So the way I read this is that it is saying there  
 20 is billions of dollars of investment needed and it is  
 21 specific to cellular baseband technology and  
 22 therefore --- and therefore it is sinking it into that  
 23 industry and if you were to exit that industry, then  
 24 essentially it is stranded or largely gone.  
 25 So that is the --- I think that is the first point.

1 I think the second issue is about --- and I think we  
 2 have this --- I do not know whether we want to cover now,  
 3 the economies of scale.  
 4 MR RIDYARD: Yes, of course.  
 5 MR NOBLE: But there is the economies of scale because, of  
 6 course, if you are sinking a very large amount of money  
 7 into something, then in order to --- for that to be  
 8 a rational thing to be doing you have to expect you are  
 9 going to acquire a significant enough amount of sales in  
 10 order to make that worthwhile and, therefore, the very  
 11 large-scale of these investments, potentially, means  
 12 that you have scale effects that you need to be able to  
 13 acquire a significant --- a significantly large chunk of  
 14 sales in order to make that worthwhile in the first  
 15 place.  
 16 MR RIDYARD: I can see the first one, you know, fits ---  
 17 seems to fit very well with the notion of asymmetry  
 18 because an incumbent has already incurred the R&D costs  
 19 and I am sitting there, thinking, "Shall I do it  
 20 tomorrow?" You are saying that is an asymmetry because  
 21 the other guy has already done it and I have not yet.  
 22 In the second one, I mean, we can both be sitting  
 23 side-by-side considering entering a market and it will  
 24 cost us both a lot in terms of getting into the market,  
 25 but the one who ends up with the 80% market share would

1 get a pay-off and the one who gets the 20% market share,  
 2 would not get enough to pay off, but that it not an  
 3 asymmetry ex ante between those two players.  
 4 MR NOBLE: No, it is not an asymmetry ex ante, but there is  
 5 a distinction between, say, two parallel industries  
 6 where you are considering that example. One industry  
 7 where you have atomised buyers, in a sense, you would  
 8 not necessarily think scale effects on their own are  
 9 the, you know, be—all and end—all. They are almost the  
 10 other side of the coin of the largeness of the  
 11 investment that, you know, in order to make it  
 12 worthwhile you have to get a lot of scale, but there is  
 13 potentially an additional barrier created by the fact  
 14 that if the scale becomes lumpy, it can then become more  
 15 challenging, in the sense of if I do not win a certain  
 16 number of big customers, if I do not build my brand  
 17 sufficiently, then it can become more one/zero than  
 18 actually I have to pass some threshold, I have to pass  
 19 some brand test, I have to pass some quality threshold  
 20 in order to be taken seriously in this industry and of  
 21 course when you have lumpiness in that, that potentially  
 22 on its own becomes a further barrier, because of course  
 23 it is a bit of a dice roll that you have to take. You  
 24 make that investment and it is very hard to get very,  
 25 very small increments of sales. You have to get

1 moderately sized ones.  
 2 MR RIDYARD: Has your rival already rolled the dice and  
 3 rolled a 6?  
 4 MR NOBLE: Well, in this particular instance, I think we are  
 5 looking at an instance where — we heard some of the  
 6 factual evidence. Qualcomm has been in this industry  
 7 for a very long time and so it has already built up  
 8 a reputation of high quality and so really the question  
 9 mark here is: how can someone enter? How can someone be  
 10 credible to rival someone like Qualcomm, or another  
 11 incumbent that has also done the same sort of thing?  
 12 For me that is the question about the entry barriers.  
 13 It is not just about Qualcomm, but it is about other  
 14 incumbents that have gone on that journey.  
 15 I think a third point to highlight here is also the  
 16 repeated nature of this, the fact that most of what  
 17 people want to buy is multi-mode phones — sorry,  
 18 multi-mode chipsets, and so it means that by the time we  
 19 get to 3G, 4G, 5G, the incumbent has already sunk  
 20 investment into the earlier standards. Qualcomm was  
 21 effective in LTE — sorry, in UMTS and CDMA 2G and then  
 22 it can build on that success because it has already  
 23 built good chipsets there. When it enters the next  
 24 round, it has already started with the skills and  
 25 technology and know-how in order to do that. It is

1 investing in the increment of doing the next round of  
 2 technology, but we know that the OEMs want these  
 3 multi-mode options so that they can operate across  
 4 multiple standards.  
 5 MR RIDYARD: That is not a fresh roll of the dice.  
 6 MR NOBLE: It is a loaded dice in a sense, yes. It is not  
 7 guaranteed that it will be successful, but in a sense it  
 8 gives it an advantage, an asymmetric advantage that  
 9 a non-incumbent does not have.  
 10 MR RIDYARD: Dr Padilla, plenty of material there for you.  
 11 DR PADILLA: Yes, I am in agreement with some of it and in  
 12 disagreement with some of it as well.  
 13 So, the first thing, are there economies of scale in  
 14 the industry? Yes, there are economies of scale,  
 15 especially with respect to R&D. I mentioned before you  
 16 need to amortise the R&D cost that incur and therefore,  
 17 not surprisingly, you are going to have always a limited  
 18 number of players and this is not just true for chipsets  
 19 and for mobiles, but in all semiconductor markets. So  
 20 that is the case.  
 21 Now, are these economies of scale sufficient to  
 22 prevent entry? The evidence there suggests "no" and  
 23 what is the evidence? The evidence is that there is  
 24 always a first mover advantage — a first mover.  
 25 Qualcomm has been typically the first mover in 3G, LTE

1 and 5G, and its market share over time declines. If the  
 2 market share over time declines, it is because,  
 3 unfortunately, there must be somebody that has entered  
 4 and has taken some of that market share.  
 5 Of course you are not going to see entry by  
 6 multitudes. That is not going to happen because of the  
 7 economies of scale that I mentioned before. You are  
 8 going to have entry by one or, at most, two players.  
 9 This is what we have observed. MediaTek entered and  
 10 took market share out of Qualcomm in all those product  
 11 spaces.  
 12 Why? Because to a large extent your success  
 13 yesterday is independent of your success today. You  
 14 need to keep investing and innovating in order to remain  
 15 a credible player in the market.  
 16 MR RIDYARD: Sorry, those are two different statements  
 17 though. I mean, yes, you need to keep investing,  
 18 clearly, but is it true that your success today is  
 19 independent of your success yesterday?  
 20 DR PADILLA: Well, completely independent it cannot be  
 21 because you build a reputation, etc, but, look, the  
 22 reputation did not save Infineon from going down in the  
 23 market because it was not able to keep up in terms of  
 24 investment and quality development. The reputation of  
 25 Intel, who else, was not enough to keep them alive in

1 the market. You need to invest very significant amounts  
2 of money on a continuous basis in order to retain  
3 a position in the market, a place in the sun.

4 Therefore, you know, again, it is not zero/one but  
5 the entrant can take market share and it does take  
6 market share and it may take some time.

7 It is important also to note that the entrant can  
8 choose the scale of entry and typically what you do is  
9 you enter at certain scale, you build some reputation  
10 and then grow from there. This is possible because, as  
11 we were discussing before, once you are in, actually  
12 there are very limited economies of scale at that point  
13 in terms of production and manufacturing. The real  
14 hurdle is to invest. As I mentioned before, the  
15 asymmetry — there may be an asymmetry, but it is not,  
16 according to the evidence, so large that it has  
17 prevented entry.

18 Therefore, any company has to keep it on its toes  
19 and doing what? First, obviously, keeping their prices  
20 at reasonable levels and be investing and the investment  
21 that we see here in terms of revenue over — and indeed  
22 over revenue are very large.

23 The last point I will make, just last point. Note  
24 that there is a sponsor entry. So we are talking about  
25 a market where there is also concentration on the other

1 side and we have seen the importance of Apple and  
2 Samsung, which, for example, in the case of Qualcomm,  
3 may represent 50% or more of its sales. As we have seen  
4 in the file, Apple sponsored the entry of Intel in 4G  
5 and it contributed therefore to compensate for some of  
6 the advantages that Qualcomm had initially. This is  
7 a very, very good example, not only because it was  
8 a sponsor entry but because you could see that clients  
9 are not necessarily exclusive. So, in that instance,  
10 Intel enter with some products and eventually grew to  
11 dominate the 4G demand of Apple.

12 MR RIDYARD: Next, just to follow up on the actual physical  
13 production through the third-party fabricators. Do we  
14 know anything about the economies of scale there?

15 I mean, do we know that a large order gets a lower price  
16 than a smaller order? I have not seen anything on that.

17 MR NOBLE: I do not think we know.

18 DR PADILLA: I know because I have been working on that  
19 industry and I have been — but it is not in the record.

20 MR RIDYARD: That is fine.

21 MR NOBLE: If I might just add a couple of very brief points  
22 on what Dr Padilla said.

23 I think one interesting point one needs to consider  
24 is the — there is some other factual evidence that  
25 I think helps us understand whether or not we think

1 there are significant barriers to entry in the sunk cost  
2 way that we have described them. Another quote that  
3 I would highlight from my eighth report is at  
4 {POE/21/45}. It is at the top of the page. This is  
5 a quote from Intel describing that acquiring an existing  
6 player in the industry was the most expedient way to  
7 enter into the LTE—CDMA segment and I take that as  
8 consistent with the idea that there is essentially  
9 a time dependency here that, you know, incumbents of the  
10 past have some advantage over the new entrants of today  
11 and Intel, in a sense, has to become hybrid. It sort of  
12 partially enters in some of the industry, but it has to  
13 or at least it describes here that its strategy was to  
14 acquire an existing player in order to achieve —  
15 overcome those entry barriers in the CDMA segment.

16 I do not know if we were going to talk about the  
17 history of entry and exit now or if that is something we  
18 should come back to?

19 DR PADILLA: Just one point, if I may?

20 MR RIDYARD: I will come back to that.

21 DR PADILLA: Entry for buyout is a form of entry. It means  
22 there are assets there that are not controlled by the  
23 incumbent and you enter so I do not see that point.

24 MR RIDYARD: So you might even argue it was  
25 a short-circuiting device to reduce possible asymmetry?

1 DR PADILLA: Right.

2 MR RIDYARD: Okay. Let us come on to the actual history of  
3 entry and exit because there is — obviously there are  
4 very high shares at any point in time, but then there  
5 are also changes in the personnel in the industry.

6 I mean, Mr Noble, I think you make comments in the joint  
7 report about how the exit of certain players shows that  
8 there are barriers to entry, but, I mean, does that  
9 follow or should we be taking a more optimistic view  
10 about the industry, given, as Dr Padilla says, people  
11 come and they go?

12 MR NOBLE: Well, I think we do see evidence that people go.

13 That is clear. People like Broadcom, for example, have  
14 exited the industry. I think there is a question mark  
15 about how many people we have seen come, because I think  
16 there is a debate about is Intel a pure new entry or is  
17 it a sort of hybrid, because it is buying an incumbent?  
18 VIA before that purchased the CDMA business of LSI in  
19 order to, as I understand it, to be credible in that  
20 space. You can see that, for example, in the history of  
21 some of the non-assert agreements that they get handed  
22 over.

23 So I think we do know there is exit and we do know  
24 that there is at least — there is evidence that is  
25 consistent with the idea that there is this time

1 dependency. There is some entry, I think that is  
 2 undeniable. MediaTek, for example, I do not think, they  
 3 appear to be a fresher entrant and there is also some  
 4 other entry, I think, in the 5G era, although it is more  
 5 of the self—supply nature because this HiSilicon, which  
 6 is closely associated with Huawei, and I think there is  
 7 also a question mark about that because there is  
 8 the whole geopolitical debate about, well, HiSilicon  
 9 essentially is not really an option for western mobile  
 10 manufacturers because of the US Government stance on  
 11 Huawei and its associates and so there is a question  
 12 mark about, well, in a sense, if that was not there,  
 13 would HiSilicon have entered in quite the way it did?  
 14 Is this almost a — is it a self—supply through  
 15 necessity because Huawei otherwise is not — cannot  
 16 guarantee itself access to these chipsets because it may  
 17 be blocked geopolitically, as opposed to on an economic  
 18 basis?

19 So, yes, they do overcome that entry barrier, but it  
 20 may be for other reasons than we are focused on here.

21 MR RIDYARD: In parallel, if you are talking about 5G, both  
 22 Apple and Samsung have, by now at least, reached  
 23 a position in 5G through doing it themselves, rather  
 24 than relying on the market.

25 MR NOBLE: Yes. Samsung certainly is a credible

105

1 self—supplier and the — Apple though essentially buys  
 2 Intel 's chipset business and the question mark then is,  
 3 well, it does take it a very long time, at least  
 4 seemingly, to convert that chipset business into  
 5 something that can provide it with a 5G chipset which  
 6 I think is a signal about, in this instance, the size  
 7 and the complexity of undertaking that kind of  
 8 investment, even though, in a sense, it is sat there  
 9 with a waiting customer, its own integrated handset  
 10 business.

11 MR RIDYARD: That shows that it is hard to do it and get it  
 12 right.

13 MR NOBLE: Yes.

14 MR RIDYARD: And it takes some time.

15 MR NOBLE: Mm—hmm.

16 MR RIDYARD: Are you concerned about what happens in the  
 17 meantime? Is that your —

18 MR NOBLE: Yes. I mean, the fact that something takes  
 19 a very long time is not in and of itself, at least for  
 20 the very period that it takes, a form of entry barrier  
 21 because it says, well, during that period someone  
 22 potentially has market power as entrants try and ramp  
 23 up, you know, solve whatever technical problems they  
 24 might have. You know, that period of time is a window  
 25 in which they are not yet acting as a discipline on the

106

1 incumbent.

2 MR RIDYARD: You can make the same comment about MediaTek.  
 3 You know, it takes a while for it to try and catch up  
 4 with Qualcomm in whichever segment you are looking at.

5 Do you have any observations on that, Dr Padilla?

6 DR PADILLA: Yes, a few.

7 First, I do not think that there is any dispute  
 8 between us that there is no hit—and—run entry. Entry  
 9 cannot happen overnight and that is why, you know, if we  
 10 would not argue there is supply substitution here, but  
 11 when we consider entry, we typically consider a period  
 12 of time, one or two years. Why do we do so? Well,  
 13 because dominance, at least as I understand it, is the  
 14 ability to sustain prices above competitive levels for  
 15 a period of time, not one day or a month or two months,  
 16 because when you think that somebody can enter in a year  
 17 or two, you are going to discipline yourself because  
 18 otherwise all that you are going to do is annoy your  
 19 customers today and then throw them in the hands of the  
 20 entrant when it finally comes.

21 So entry has a discipline effect, not only when it  
 22 happens but when it is clear that it will happen or can  
 23 happen. So I think that that is important.

24 The second point is that what we see is a few  
 25 instances of exit. We see some failed attempts to enter

107

1 and we see at least a very successful entry story, which  
 2 is MediaTek, which eventually became leader in 3G, 4G,  
 3 5G, by 2023 even leader in 5G, but we see other  
 4 instances of entry. As you pointed out, there is the  
 5 expansion — more than the entry, the expansion of  
 6 Samsung and the entry for buy—out, among others, of  
 7 Apple. If I am not mistaken, the iPhone 17 Pro sells  
 8 with an Apple chipset, the A19.

9 That is a new player. It did not enter buying some  
 10 of the assets of Intel. Quite frankly, it did so  
 11 because Intel was a failure and so instead of propping  
 12 up Intel, what it did is it acquired and developed its  
 13 own capabilities, but now, when Qualcomm deals with  
 14 Apple, it is going to have to face the competitive  
 15 constraint that is imposed, not just by MediaTek, but  
 16 also by the self—supply you know of —

17 MR RIDYARD: But in that case, a five—year gap between the  
 18 acquisition of the Intel business and actually producing  
 19 5G chips, is that — at what point does the delay become  
 20 so long that you say —

21 DR PADILLA: That is a fair point. I would not recall when  
 22 they bought Intel, to tell you the truth.

23 MR RIDYARD: 2019, I think. Do not trust me on that.

24 DR PADILLA: I would not be able to tell you. I would not  
 25 be able to tell you. I do not remember now what was the

108

1 period of time for which the duration of the contract —  
 2 the contract with Qualcomm, but I do agree with you that  
 3 time matters and if we go beyond two or three years,  
 4 then it is less of a constraint than if we are in one or  
 5 two years.  
 6 Think about the cumulative effect. I think that  
 7 MediaTek has started winning market share much more  
 8 quickly. 2023, it is leading in the market. Samsung  
 9 was there.  
 10 MR NOBLE: I guess one other point that I would note in this  
 11 regard is I think there is a signal in the fact that  
 12 incumbents feel — sorry, chipset buyers feel the need  
 13 to sponsor entry because when you talk about industries  
 14 that do not have very high entry barriers, you do not  
 15 even trouble yourself with debating whether people have  
 16 to sponsor entry because people organically overcome  
 17 them. Why would an incumbent — a large buyer go to the  
 18 trouble of guaranteeing sales to an as-yet unproven  
 19 supplier?  
 20 They typically are incentivised to do that because  
 21 they recognise the fact that if they do not do that,  
 22 then there may not be entry and why would there not be  
 23 entry? Because there are entry barriers in the first  
 24 place.  
 25 DR PADILLA: I am not sure that I would agree with that, to

109

1 tell you the truth.  
 2 MR RIDYARD: Sorry, Dr Padilla, the act of sponsoring entry  
 3 is the act of overcoming those barriers, is it not?  
 4 MR NOBLE: Yes, it is, but I think, as I said, it is the  
 5 fact that you have to go to the trouble of it that tells  
 6 you that the entry barriers are there in the first place  
 7 and there is then a question of how effective are you at  
 8 sponsoring that entry? So you try and sponsor the  
 9 entry. You try and help the rival leap the hurdle and  
 10 perhaps they do, in the sense then that at the point  
 11 they leap that, at least there is one more supplier than  
 12 there was before, but if they do not or it takes them  
 13 longer than you expected, then in a sense what it has  
 14 told you is (a) there was an entry barrier to start with  
 15 that you were trying to overcome and (b) it is perhaps  
 16 very hard to overcome it because, despite the sponsoring  
 17 of the entering, there is then either no entry or it is  
 18 a very prolonged entry period.  
 19 MR RIDYARD: Dr Padilla, I interrupted you.  
 20 DR PADILLA: No, no, I interrupted you actually and  
 21 apologies for that.  
 22 I was going to say that, no, I do not think that is  
 23 the case in that, you know, entry involves some costs  
 24 and it involves some ingenuity. You may lack money or  
 25 you may lack ingenuity. When somebody buys you, it may

110

1 be because it wants to provide you with the funds that  
 2 you lack or because it provides you with ingenuity that  
 3 you lack, but ingenuity is not a barrier to entry. It  
 4 is unfortunate that not everybody is able to develop the  
 5 same products and services and I think that Apple  
 6 brought ingenuity, capability, creativity and not only  
 7 funding, because I think that, frankly, Intel has good  
 8 access to the capital markets in the US and it appears  
 9 also to the US Government to get the funds needed in  
 10 order to invest, especially, you know, now perhaps it is  
 11 going through difficulties, but it will go back in time.  
 12 MR RIDYARD: Okay. Just to move on slightly, and that is  
 13 the notion of economies of scope. I think at that one,  
 14 Mr Noble, you indicated you thought there were economies  
 15 of scope in this industry. Is that a part of — is that  
 16 an immaterial part or is that an important part? Did  
 17 I just imagine the whole thing?  
 18 MR NOBLE: No, I think you did not. I just want to check  
 19 exactly what I said because I think ...  
 20 No, yes, this is paragraph 3.36.  
 21 MR RIDYARD: In the joint?  
 22 MR NOBLE: {POE/21/49}. Is that the part you had in mind?  
 23 No, maybe — sorry, 48 {POE/21/48}. I am on the wrong  
 24 page. It is 3.37. If we go back a page.  
 25 MR RIDYARD: Can we go back one page?

111

1 MR NOBLE: I think this is the point you are referring to  
 2 because I talk part economies of scope. I think I was  
 3 using that somewhat synonymously with the point about  
 4 the multi-mode point that I made earlier on about the  
 5 fact that because you have provided a history of — you  
 6 are a proven entity in GSM and in CDMA one, then that  
 7 helps you with the next round of standards. Yes,  
 8 because it is in a sense —  
 9 MR RIDYARD: It has an ascendancy.  
 10 MR NOBLE: Yes, exactly. It is almost what the multi-mode  
 11 chip is, it is a GSM chip and it is a CDMA one chip and  
 12 it is a CDMA 2000 chip all in one so one can conceive of  
 13 those as an economy of scope. Over time, that then  
 14 becomes an incumbency advantage, because of course these  
 15 standards arrive over time. Initially, there is just  
 16 GSM and CDMA one and then we have those two, plus two  
 17 more, and then, again, we have those four, plus a fifth  
 18 one, which is 5G. So I think that is — that was how  
 19 I meant that.  
 20 MR RIDYARD: Yes.  
 21 DR PADILLA: Again, not zero/one. I would admit that there  
 22 may be some economies of scope related to reputation,  
 23 but I think that the evidence in the market suggests  
 24 that those economies of scope are not determinative and  
 25 the reason is because if they were so insignificant, you

112

1 would have a lot of parallelism in the market structure  
 2 irrespective across standards and, you know, you would  
 3 not have movement in one standard, whereas in the other  
 4 there is not that much movement in market share. So  
 5 there may be some, but I think that they are limited and  
 6 they have not prevented the emergence of players in each  
 7 of the different generations.

8 MR RIDYARD: So let us move on then to the consequences of  
 9 your — I mean, clearly you have somewhat opposing views  
 10 on the existence of barriers to entry. Let us look at  
 11 how that impacts on the view about Qualcomm's market  
 12 power.

13 I mean, Mr Noble, in your view, does the existence  
 14 of entry barriers or other factors, does that allow  
 15 Qualcomm to set chipset prices significantly above the  
 16 competitive level?

17 MR NOBLE: It gives it the potential to do so, yes.

18 MR RIDYARD: If you have the potential, why would you not  
 19 use it?

20 MR NOBLE: I mean, this goes back to the conversation we had  
 21 earlier on, which is about whether or not if you have  
 22 market power, what do you do with it? You could set  
 23 a high chipset price or you could seek to leverage that  
 24 market power into a royalty rate, or you could do a bit  
 25 of both.

1 MR RIDYARD: And then, Dr Padilla, we are back in the  
 2 Goldilocks territory here which you commented on  
 3 earlier .

4 DR PADILLA: Yes.

5 MR RIDYARD: Just to be clear, Mr Noble, your position is  
 6 that they choose — Qualcomm chooses to maybe exercise  
 7 a bit of market power by charging somewhat higher —  
 8 excessively high prices in chipsets, but mainly using it  
 9 as a lever in the theory of harm about denying access to  
 10 FRAND arbitration?

11 MR NOBLE: Yes, exactly. The Class Representative's theory  
 12 of harm is that they take that market power which I say  
 13 they have in the chipset market, and it varies exactly  
 14 which one, but they then gain a benefit from that by too  
 15 high a royalty rate.

16 MR RIDYARD: They do it by deliberately choosing not to  
 17 exploit it properly in chipsets but to use it elsewhere?  
 18 Is that how it works?

19 MR NOBLE: Yes. I think to be economically coherent, they  
 20 need to do that because if one believes in one economic  
 21 rent, then you cannot have that rent twice. You cannot  
 22 simultaneously take a very high chipset price and have  
 23 a high royalty rate. That would not be a coherent  
 24 theory of harm.

25 MR RIDYARD: But why do they — I will give you chance in

1 a minute, Dr Padilla, but why do they choose to cash in  
 2 through that mechanism, rather than just charging high  
 3 prices for chipsets? Is there any difference really?

4 MR NOBLE: Yes, I think there is, and it is to do with the  
 5 nature of the entry barriers . We have talked here  
 6 about, you know, a chipset market where the entry  
 7 barriers are in a sense natural entry barriers . They  
 8 are created by the features of the industry, you know,  
 9 the complexity of the technology, the size of the  
 10 investment, the sunkness of that investment. The entry  
 11 barriers in SEPs, they are statutory. They are created  
 12 by law and the — so, in that sense, it is not possible  
 13 for someone else to enter and be a competitor to the  
 14 specific SEP, once it is declared a standard essential  
 15 patent, and assuming that they really are valid patents  
 16 and that they are really infringed and they are really  
 17 essential , assuming all of those characteristics are  
 18 met, then in a sense there is a statutory barrier to  
 19 entry saying that other people cannot compete for these  
 20 SEPs, they are quasi government awarded monopolies.

21 THE CHAIR: I just do not understand this because you are  
 22 saying that they are doing two things. One is that they  
 23 are leveraging into a market where they have even more  
 24 barriers to entry, 100% market share in a SEP market,  
 25 and, secondly, they are leveraging into that market

1 where the exercise of that market power is constrained.  
 2 So you are doing two things: you are leveraging them one  
 3 way and you are leveraging into a market where the abuse  
 4 of market power is constrained by the FRAND network.  
 5 Why would they do that? Why would you not just take the  
 6 chipset market where you do not have — you do not have  
 7 the problem of constrained by FRAND?

8 MR NOBLE: Well, the logically coherent answer to that is to  
 9 say that, absent this behaviour, you potentially have  
 10 market power in SEP markets, but there is a very strong  
 11 countervailing force against you, which is called the  
 12 FRAND regime; the ability of implementors to go and  
 13 essentially get a regulated price , as it were, from you.  
 14 So you cannot — you are not free to exercise that  
 15 market power, but the logic of the theory of harm is  
 16 that you unshackle yourself from that regulated price by  
 17 using the market power in the chipset market and then  
 18 you, in a sense, disable the FRAND regime so the  
 19 regulated price is no longer active and you in a sense  
 20 are unlocking this market power that you had there.

21 Now, I guess there is a conceptual debate about is  
 22 the rent that you are taking there actually the rent of  
 23 chipset market power or is it the as-yet — the  
 24 constrained rent that you were not able to take in a SEP  
 25 regime? I am not sure it matters which version of that

1 world is true. It is the fact that ---  
 2 THE CHAIR: But one way or the other, you are using your  
 3 chipset market. Whether you describe that as exercising  
 4 your chipset market power or leveraging your chipset  
 5 market to unshackle the SEP regime from FRAND, one way  
 6 or the other it is dependent on your chipset market  
 7 power so why do such a complicated thing of trying to  
 8 take your rent out of a constrained market? Why not  
 9 just take it out of the unconstrained market? It does  
 10 not make sense to me.  
 11 MR NOBLE: Well, the rationale would be that --- and I think  
 12 Dr Padilla alluded to ---  
 13 DR PADILLA: I subscribe to what the Chair has been saying.  
 14 THE CHAIR: I am trying to understand what you are saying.  
 15 I just do not understand.  
 16 MR NOBLE: In the chipset market, if one takes the view that  
 17 there are some entry barriers, the question is: why  
 18 would someone go to the trouble of overcoming them?  
 19 They go to the trouble of overcoming them because there  
 20 is an incentive to overcome them. The higher the  
 21 chipset price, the stronger the incentive.  
 22 So normally in an exploitative abuse case,  
 23 we explore the question of, well, or, rather, we think  
 24 very hard about exploitative abuse, because we think,  
 25 well, the high prices are what killed the market power

1 in the first place and so a lot of markets that have  
 2 entry barriers are self-correcting, either people behave  
 3 themselves and charge low prices, therefore not  
 4 exploiting their market power, or they charge high  
 5 prices, take advantage of their market power and  
 6 encourage entry. This allows Qualcomm to have it both  
 7 ways. They can charge a lower price. It might still be  
 8 higher than the competitive price, but it is a lower  
 9 price than they would have otherwise charged, but they  
 10 can still take advantage of the fact that there is this  
 11 sort of excess market power that they have not converted  
 12 into chipset price, the more contestable market, into  
 13 a high price that they then charge in the SEP market  
 14 where it is not contestable because these are patents  
 15 that in a sense government regulation says that you  
 16 cannot contest them.  
 17 DR PADILLA: If I may, with all due respect, I think that  
 18 there is a problem in that line of argument and the  
 19 problem is as follows: suppose that you decide not to  
 20 exploit your market power, which at points by the way it  
 21 is characterised as being an indispensable trading  
 22 partner. Suppose you decide not to exploit that  
 23 directly but indirectly through the patents. What is  
 24 going to happen is if you think that entry into chipsets  
 25 is possible if the price signal is --- if the rents are

1 sufficient, what you are going to have is that those  
 2 OEMs that are paying you those very high royalties are  
 3 going to sponsor the entry. So eventually your attempt  
 4 to displace your market power from one market to the  
 5 other is going to end up backfiring in the first market  
 6 anyway.  
 7 MR RIDYARD: Your response to that?  
 8 MR NOBLE: I think it really matters about who benefits from  
 9 the entry because the more atomised the customers, the  
 10 less incentive that any individual OEM has to, in  
 11 a sense, go through this process of undermining  
 12 Qualcomm's market power in chipsets, not to get a lower  
 13 chipset price, but in order to get a lower royalty rate,  
 14 which inevitably is going to be shared with everybody  
 15 because, you know, if they feel comfortable to then go  
 16 and launch FRAND charges and so on, then it is likely to  
 17 set a precedent that will undermine Qualcomm's strategy  
 18 and mean that all OEMs benefit. So there is this big  
 19 externality. There is lots of cost on them and there is  
 20 lots of benefit to everybody else and so there is really  
 21 a question mark about the incentives on the incumbent  
 22 OEMs in order to sort of do this public good of going  
 23 to, you know, the trouble of sponsoring entry with the  
 24 purpose of lowering royalty rates.  
 25 DR PADILLA: No, Robin, Mr Noble, I did --- you are not

1 responding to the mechanism that I postulated. I did  
 2 not say that because they were paying very high  
 3 royalties, they would initiate FRAND litigation. What  
 4 I said is that with the rents that --- in order to save  
 5 those rents, they would sponsor entry into chipsets. In  
 6 fact, to some extent, you can think that that is what  
 7 Apple did.  
 8 MR RIDYARD: I was having that very same thought. Does that  
 9 help you or hinder you?  
 10 DR PADILLA: Well, it did that in response to the chipset  
 11 position of Qualcomm. You do not need to go through  
 12 this very convoluted situation. If the problem --- if  
 13 the problem in the market is that you have market power  
 14 in chipsets, you address that problem directly by trying  
 15 to sponsor entry and have a more dynamic and competitive  
 16 market.  
 17 THE CHAIR: So I think your response, Dr Padilla, is to  
 18 Mr Noble's point that the logic of exploiting market  
 19 power indirectly is that that, he said, allows Qualcomm  
 20 to have it both ways. It is not exploiting it directly  
 21 in the market where it might face competitive entry, if  
 22 it were to do so, by charging excessive prices there.  
 23 It thinks that it can exploit the market power  
 24 indirectly and thereby gain the monopoly rent while, to  
 25 some extent, shielding itself in its position in the

1 market which gives it that monopoly rent.  
 2 Your response is: it would happen in either way?  
 3 DR PADILLA: Because the buyers are the same and the buyers  
 4 are powerful.  
 5 THE CHAIR: Because whether or not you have entry in  
 6 response to exploitation in the chipset market or you  
 7 have it in response to exploitation in the SEP market,  
 8 your point is the buyer is the same, ultimately it is  
 9 the OEM, and the incentive is one and the same?  
 10 DR PADILLA: It has an incentive to anticipate those rents  
 11 and it can do that through entry.  
 12 THE CHAIR: Right. So the constraint from the threat of  
 13 entry is the same whichever market you exploit?  
 14 DR PADILLA: Under the assumption that Qualcomm is doing  
 15 what is alleged to be doing.  
 16 THE CHAIR: Yes.  
 17 DR PADILLA: Which, you know, it is — which we are  
 18 operating here.  
 19 THE CHAIR: We are just trying to tease out why economically  
 20 you would do that. I understand. That is what your  
 21 response is?  
 22 DR PADILLA: Yes.  
 23 MR NOBLE: My response to that is this issue around the  
 24 externality that you create, because if you are a large  
 25 OEM and you sponsor entry and the purpose of sponsoring

121

1 entry is not to lower chipset prices because in a sense  
 2 they might not be too high, or they might be, but they  
 3 might not be in this postulation, there is a very direct  
 4 externality that they create by that because they do it  
 5 in order to then be able — because to stop Qualcomm  
 6 having the rent, what you have to do is to get them to  
 7 behave differently and one way you might behave  
 8 differently is that you might launch a FRAND challenge  
 9 or you might, you know, just drive a very hard bargain  
 10 in the negotiation that you have, but I think, as  
 11 Qualcomm have highlighted, some OEMs have MFN clauses  
 12 and so if you do that, then you benefit both yourself,  
 13 who incurred all that entry sponsoring cost and energy,  
 14 but you also benefit your rivals also who did not and  
 15 therefore they get a lower royalty rate as well and so  
 16 there is a question mark about the incentives in order  
 17 to go about doing that in the first place.  
 18 MR RIDYARD: But then you are saying there is no point in  
 19 investing in efforts to reduce your cost if it is going  
 20 to reduce your rival's costs in the same way?  
 21 MR NOBLE: Well, it is not that you do not have any  
 22 incentive; it is that you have an attenuated incentive.  
 23 I think that the distinction.  
 24 DR PADILLA: But if you invest in providing self-supply, you  
 25 are not generating any externality. I do not think

122

1 that —  
 2 MR RIDYARD: Well, you would if you believe that you invest  
 3 in self-supply. You can then mount a FRAND challenge  
 4 because the leverage thing goes away and you get the  
 5 FRAND rate down for yourself and then the middle  
 6 automatically comes down for everyone else. That is the  
 7 argument being made.  
 8 DR PADILLA: But you will have eliminated all market power  
 9 in chipsets and then you will have eliminated — I mean,  
 10 then the theory of harm is no longer there.  
 11 MR RIDYARD: Okay.  
 12 DR PADILLA: I am saying this because in the counterfactual,  
 13 the counterfactual, as I understand it, now, is that you  
 14 will go FRAND.  
 15 THE CHAIR: We will get on to the counterfactual. Let us  
 16 park that.  
 17 DR PADILLA: It is only one comment there, which is that  
 18 going FRAND in the counterfactual will also generate  
 19 externalities so the externalities are not different in  
 20 the factual and in the counterfactual.  
 21 THE CHAIR: We will move on to the counterfactual later,  
 22 probably tomorrow.  
 23 MR RIDYARD: That is very useful. I think we will have to  
 24 reflect a bit on that exchange, but I think it was  
 25 a very useful one to have aired so thank you very much.

123

1 My next subtopic was buyer power, including  
 2 self-supply. As I go through my questions I will  
 3 probably find myself thinking we have already covered  
 4 that in the preceding discussion, but let me have a go  
 5 anyway. I guess I can ask just as a sort of conceptual  
 6 question really: what are the things we should be  
 7 looking at when we talk about buyer power? What are  
 8 the — why is buyer power a mechanism that is different  
 9 from other competitive — distinctive from other  
 10 competitive factors and what it is we should be looking  
 11 at in principle when we come to evaluate whether buyer  
 12 powers is effective or not? Maybe, Dr Padilla, you  
 13 might go first on that one.  
 14 DR PADILLA: Yes. I think the reason why buyer power is  
 15 particularly relevant in this case is that if Apple or  
 16 Samsung stop purchasing chipsets from Qualcomm, then  
 17 that has a dramatic impact on the profitability of  
 18 Qualcomm's chipset business and it does so because they  
 19 represent a very significant chunk of the volumes that  
 20 Qualcomm sells. That means — that is very important  
 21 because that means that Qualcomm's threat of not  
 22 supplying if you do not agree on a certain price are not  
 23 credible and they are not credible because Qualcomm  
 24 cannot get all those volumes and find alternatives for  
 25 those volumes.

124

1 Now, of course this is possible because Apple and  
 2 Samsung have dimensions of flexibility, either through  
 3 self-supply, sometimes, either through MediaTek, in some  
 4 occasions and it is — though difficult, it is easier  
 5 for them to exercise that flexibility than for Qualcomm  
 6 to find alternatives to Apple and Samsung. That is why  
 7 I was, before, illustrating or, you know, highlighting  
 8 the fluctuations in Qualcomm's shares in response to  
 9 decisions made by Apple and Samsung.

10 MR RIDYARD: Mr Noble.

11 MR NOBLE: I think there are two real sources of  
 12 countervailing buyer power that we need to think about  
 13 in the context of this case. I think the first one is  
 14 the topic that Dr Padilla just covered, which is really  
 15 the size of the buyer in the chipset market. However  
 16 you define it, whether it is his market or my market,  
 17 I think there is agreement that it is possible that very  
 18 large buyers that are active in those markets, if they  
 19 have a credible alternative, if they have good choice,  
 20 they can then threaten credibly to the supplier that is  
 21 potentially dominant to switch away a significant volume  
 22 to essentially seek to try and discipline their  
 23 behaviour.

24 So that is sort of conceptual source one of buyer  
 25 power.

125

1 The second one is actually in the licensing market,  
 2 in the SEP market, and that is where one might be  
 3 engaging in a cross-licence and so — now, I think that  
 4 is not very relevant for Apple because they did not have  
 5 any or they do not have very many SEPs. It is also not  
 6 relevant for several other OEMs because quite a few of  
 7 them do not have that. So that sort of falls away for  
 8 a lot of them.

9 There are a number of them that do have a number of  
 10 SEPs and so that is an interesting question to ask  
 11 ourselves: could they use those in order to act as some  
 12 sort of countervailing force?

13 MR RIDYARD: Does Qualcomm need SEPs?

14 MR NOBLE: Well, that is really the question then and there  
 15 is some debate between Dr Padilla and I in the joint  
 16 statement about, in a sense, the differing positions of  
 17 the OEM, which is implementing the SEPs. I think, as  
 18 I understand the technical and the industry experts,  
 19 there is universal agreement that a mobile phone  
 20 implements these. So in order to — for Apple or  
 21 Samsung or Huawei to sell a phone that is licensed, it  
 22 has to have these SEPs. However, Qualcomm does not sell  
 23 phones. It sells chipsets. So there is a question mark  
 24 about, well, does it need them or does it merely want  
 25 them? There is a big difference between needing and

126

1 wanting and if it just — I do not think it needs them  
 2 because, as far as I can see, it generally is not —  
 3 certainly in the world we think in device licensing, it  
 4 is the way things are. It does not need to have these  
 5 SEPs. It may want to have them for security. It may  
 6 want to have them so it can use them as part of  
 7 a grant-back network but, in a sense, those are  
 8 nice-to-haves as opposed to must-haves and that is  
 9 a critical distinction between two sides of the debate.  
 10 One side, the OEM, needs the patents in order to sell  
 11 licensed phones and Qualcomm does not necessarily need  
 12 them.

13 MR RIDYARD: Any comment on that particular point?

14 DR PADILLA: Sorry, on the SEPs?

15 MR RIDYARD: Yes.

16 DR PADILLA: I think that — I am not going to get into  
 17 whether Qualcomm needs them or not, because it is more  
 18 a factual issue. But in terms of the economics, I think  
 19 that the evidence that we see is that they have a very  
 20 limited impact on the agreements that Qualcomm has  
 21 entered into. They do not explain much. That is why,  
 22 in the leveraging analysis, I downplay and I only  
 23 perform a robustness test with respect to  
 24 cross-licensing. So there I would agree.

25 But we were talking about chipsets and on chipsets,

127

1 on the contrary, I think that Samsung and Apple do have  
 2 very significant bargaining power by virtue of their  
 3 sheer size and the availability of options.

4 MR RIDYARD: Two points — as you just said: two points  
 5 there. One is what does — what do I have to lose if  
 6 I do not get this customer's demand and the other  
 7 is: can they credibly threaten to take that away from  
 8 me? On that credibility point, I mean, how — can you  
 9 give us any advice on how we should evaluate that  
 10 credibility point, because there are quite a lot of  
 11 points in the case where there is — obviously there is  
 12 uncertainty about the technical capability of various  
 13 players in the industry. We know some are more  
 14 accomplished than others, but we do not really know how  
 15 credible is it when Apple says, "If you do not give me  
 16 this price, I will switch to MediaTek or VIA or  
 17 whoever". I mean, can you give us any advice about how  
 18 we should factor in that uncertainty into our analysis?  
 19 Dr Padilla, start on that.

20 DR PADILLA: Yes, I think that there is — the first  
 21 question is at which point in time we are going to be  
 22 looking at this and there may be some disagreement  
 23 there. I think my view is that it has to be at the  
 24 point in time in which there were negotiations.

25 MR RIDYARD: I understand your position on that.

128

1 DR PADILLA: According to the fear of harm. There what you  
2 need to see is what are the available alternatives? Are  
3 there available alternatives? Did they have products  
4 and did they have the capacity?

5 MR RIDYARD: But even that is not clear, is it, because if  
6 you take the 5G example Apple might have been  
7 threatening or Qualcomm might have been concerned that  
8 Apple was about to switch to Intel's 5G chips and maybe  
9 at some point that was a real fear but, as it turns out  
10 now, it appears that Intel made a mess of it and was  
11 never able to produce one.

12 DR PADILLA: That is a very good point.

13 MR RIDYARD: So how do we evaluate that?

14 DR PADILLA: We need to focus on the information available  
15 to both sides at the point in time in which they were  
16 negotiating to understand what were the parties that ---  
17 or the alternatives that each of them considered that  
18 the other had, because that is what is going to  
19 determine the credibility of the threats and the  
20 credibility of the bargaining positions.

21 MR RIDYARD: It is not always easy to piece that together  
22 from snippets from email conversations and negotiations.

23 DR PADILLA: Very complicated.

24 MR RIDYARD: Mr Noble, can you help us out on that at all?

25 MR NOBLE: I am not sure there is a magic answer. I mean,

1 I do think that there is clearly a lot of factual  
2 dispute between the parties about what happened when and  
3 the relative credibilities of different parties.

4 I think one answer to that question is one just has to  
5 roll one's sleeves up and look in detail at all of that  
6 evidence and, you know, I do think that, in a sense,  
7 there are two sources of evidence that you have --- two  
8 classes of evidence. I think, as you have alluded to,  
9 one is the contemporaneous evidence of the emails, the  
10 witness statements, what the parties said at the time,  
11 and the other is then what actually happened in the  
12 market and of course there is a risk with what actually  
13 happened in the market is using the benefit of  
14 hindsight, but, you know, it does send you a signal  
15 about what may have been going through people's minds,  
16 how credible really were some of these threats. So,  
17 yes, I do not think it is a very easy question to  
18 answer, but I think --- ultimately, I think one  
19 potentially does have to almost go through year-by-year  
20 and make a factual decision about in this year this was  
21 credible, in that year it was not.

22 DR PADILLA: One additional comment because I fundamentally  
23 agree with what has been said, but I think that if we  
24 use the benefit of hindsight, we need to use the benefit  
25 of hindsight 100%. Meaning: you have to think, okay,

1 what happened one year after, two years after,  
2 three years after. What we cannot do, for example, and  
3 just as a hypothetical, is to say: we postulate that  
4 Apple was able to foresee that Qualcomm was going to be  
5 successful, was able to foresee that Intel was not going  
6 to be successful, was able to foresee that it would take  
7 a lot of time for them to develop their own chipsets,  
8 was completely ignorant about the fact that MediaTek was  
9 going to grow very fast and it was going to, in 2021,  
10 2022 and 2023 provide an alternative.

11 Those are, you know, perfectly possible assumptions  
12 but not very plausible. I think that if you have  
13 foresight, you have foresight for everything or for  
14 nothing because otherwise we can tailor --- we can  
15 explain whatever basically.

16 MR RIDYARD: Yes, okay. We will have to wrestle with that  
17 problem ourselves.

18 MR RIDYARD: One other aspect which --- there may be very  
19 little in this, but it is just something I thought might  
20 be useful to raise with you is of the things that the  
21 buyers can do to try and leverage their market power,  
22 one suggestion in some of the documents is that it might  
23 have been in Samsung's and Apple's interests to link the  
24 supply of chipsets with the royalty rates on SEPs in  
25 principle. The argument --- I guess the argument there

1 being on SEPs, you know, they are essential so you have  
2 to have them and there is no easy way out of that, but  
3 at least on chipsets, even if you might consider  
4 Qualcomm to have market power, at least there are  
5 alternatives. So could it be rational for big buyers to  
6 take steps themselves to link these two products in  
7 their negotiations with Qualcomm?

8 It is almost like the reverse of the leverage theory  
9 that we talk about here, but could that be a rational  
10 thing for these companies to do or is there some reason  
11 why that does not make sense? Maybe, Mr Noble, you  
12 might go first.

13 MR NOBLE: I guess the question is might they have an  
14 incentive to do that? I guess the question is do they  
15 have the ability to do that is I guess the question, but  
16 I perhaps we have dealt with that in a sense that it  
17 really is about the size and the credibility of  
18 switching. So obviously if you decide they do not have  
19 the ability to do it, then incentive slightly falls by  
20 the wayside.

21 If they have --- if they have the ability, do they  
22 have the incentive to then engage in this? Potentially,  
23 but I think this comes back to the point that  
24 I mentioned before about the externality of doing that,  
25 because, particularly in the presence of MFNs or if you

1 do that via a FRAND challenge, then it is not just you  
 2 that benefits. You are changing the terms of trade for  
 3 everybody potentially and so, you know, it does not mean  
 4 there is no incentive but it alters that incentive. It  
 5 potentially makes that less attractive for you to do it,  
 6 because normally acting on these kinds of incentives is  
 7 not free. Launching a FRAND challenge is not a free  
 8 thing to do. Why would you want to do that?  
 9 You might do it if it is really necessary, but if  
 10 a lot of those gains are going to go to an archrival,  
 11 well, that might cause you to pause and be less  
 12 incentivised to do that.  
 13 MR RIDYARD: I am thinking — this logic does not even work,  
 14 but I am thinking I have no choice but to pay the  
 15 royalty rate because it is essential, but I do have  
 16 a choice about how many chips to buy from you so I could  
 17 go into the negotiation saying, "If you do not give me  
 18 a good deal on the royalty rates, I will do everything  
 19 in my power to buy chips elsewhere".  
 20 MR NOBLE: Yes, but I think there is a question mark there.  
 21 If you really have that power, why would you not simply  
 22 do it more neatly on the chipsets? Because then you  
 23 sidestep the externality issue.  
 24 MR RIDYARD: Okay.  
 25 Dr Padilla, is this talking nonsense?

133

1 DR PADILLA: No, I think that is actually a very good point  
 2 and not just theoretical. I think it is practical.  
 3 Look, I think that it would be interesting to think  
 4 in terms of the Apple 2013 agreement there is the BCPA  
 5 negotiation. There I think that there are different  
 6 ways in which you can read that negotiation. One  
 7 possibility, one interpretation, which tends to be the  
 8 one that Qualcomm favours, is that what Apple did was to  
 9 basically say, "Look, I think you have to give me  
 10 a massive amount of money or otherwise I do not buy  
 11 chipsets from you". By the way, you have to give me  
 12 that amount of money upfront and I am not going to offer  
 13 you a volume commitment or a price commitment.  
 14 The other interpretation of that agreement is  
 15 Apple's interpretation, which is that actually what they  
 16 secured using that mechanism was a reduction in the  
 17 royalty. I am not sure exactly what interpretation is  
 18 correct. I think in the report I have used the Apple  
 19 interpretation for consistency with the analysis of the  
 20 theory of harm, but you can see that either directly or  
 21 indirectly ultimately what they do, by virtue of using  
 22 their bargaining power, is to reduce their costs quite  
 23 materially and I do not see any form of externality.  
 24 Importantly, I would like to say that implicit in  
 25 lots of what my colleague has been saying is that

134

1 whenever you achieve a reduction in your royalty rate  
 2 that translates to everybody else on a one-to-one basis,  
 3 I do not think that the evidence supports that  
 4 statement. JP3, my third report, I think, illustrates  
 5 that.  
 6 (redacted — confidential information)  
 7 MR RIDYARD: Okay. That is helpful.  
 8 I want to now move on to the — well, I have a list  
 9 of them under the topic of market dynamics. (Pause)  
 10 THE CHAIR: I have just been discussing with the panel the  
 11 timing. We are doing quite well on timing and, sorry,  
 12 Mr Noble, but I think it would be a good idea if we were  
 13 able to finish tomorrow. I am sure everyone on that  
 14 side of the room would be quite happy to be able to talk  
 15 to you both over the weekend, if that is possible.  
 16 Rather than just coming back for what may be just the  
 17 dregs on Monday, I am just wondering if we can make the  
 18 timetable work for us to finish the hot-tub by tomorrow  
 19 evening. We do have to clear out of here by shortly  
 20 after 3.00 tomorrow so I just want to canvas the views  
 21 of those in the court as to whether we might sit  
 22 a little bit late today and obviously it has been a long  
 23 day for you both so if that is not going to be all  
 24 right, please tell me, but my thought is whether we  
 25 should sit a little bit late today. So I am thinking

135

1 maybe to go through until 3.20, take maybe a ten-minute  
 2 break to give you a bit more time, then go through until  
 3 4.45, 5 o'clock, no later than 5.00, and then to come  
 4 back a little bit earlier tomorrow, maybe 9.30, so that  
 5 we can get through the day tomorrow.  
 6 That would then bring everything forward in the  
 7 timetable by a day. So —  
 8 DR PADILLA: I am available.  
 9 MR NOBLE: That works.  
 10 THE CHAIR: If we do give you a ten-minute break at 20 past,  
 11 otherwise it will be a long afternoon for you. Can  
 12 I just check whether that will work for everyone else?  
 13 MR JOWELL: It will work for us.  
 14 MR WILLIAMS: I think sitting late today is fine. I think  
 15 there is a question about what is meant by bringing  
 16 everything in the timetable forward by a day, just  
 17 because we have a deadline on Monday lunchtime at the  
 18 moment and so on, but that is probably a question for  
 19 another moment, Madam.  
 20 THE CHAIR: Yes. We can discuss that tomorrow. I was  
 21 envisaging that everything would come forward  
 22 potentially so we would finish everything a day earlier  
 23 than currently. As I have said several times during  
 24 this and the PTR, if we go short, the idea is that we do  
 25 not just build in extra days for writing closing

136

1 submissions but we bring the timetable forward.  
 2 Can I just check if that is all right with the  
 3 transcriber and the Tribunal staff. (Pause)  
 4 MR RIDYARD: Some questions under the general topic of  
 5 market dynamics which covers quite a few factors to be  
 6 honest. First of all, I think, Dr Padilla, you have  
 7 already stated you think it is important when we are  
 8 looking at market shares and market power assessments,  
 9 we do it at discrete points in time and you indicated  
 10 obviously the points in time at which significant  
 11 negotiations were taking place between Qualcomm and the  
 12 two OEMs.

13 Mr Noble, are you in agreement with Dr Padilla on  
 14 that, because I know at some point you said in some ways  
 15 you could characterise the situations as at any point  
 16 one could burst into negotiations if you wanted to?

17 MR NOBLE: Yes, so I think there is certainly agreement at  
 18 the moments when Dr Padilla thinks we should analyse it,  
 19 I agree those are good moments to do an analysis so  
 20 there is full agreement on that. I think I used the  
 21 word "continuous" I did not mean sort of every one  
 22 minute. What I meant by that was the notion that  
 23 perhaps on a year-by-year basis it is possible that  
 24 there are negotiations that never happened, that people  
 25 contemplated and felt dissuaded from engaging in

137

1 litigation because, you know, they felt as though it was  
 2 a pointless exercise, that Qualcomm was in a very strong  
 3 position and therefore why waste the time and energy  
 4 doing that. So I do think it is worth doing that.

5 I think also it is useful to think of that in the  
 6 broader context, because of course the specific points  
 7 in time we are talking about here, they relate to --- or,  
 8 rather the specific points in time that Dr Padilla is  
 9 referring to are the Apple and Samsung negotiations,  
 10 but, as I said, there is the indirect mechanism by which  
 11 other OEMs are negotiating and there are many dates for  
 12 that and so I think a practical way forward is  
 13 essentially to do it on a year-by-year basis or  
 14 something similar to that or perhaps a period-by-period  
 15 basis.

16 MR RIDYARD: Just to be clear, even if we were just looking  
 17 at Apple and Samsung, your view is it would be possible  
 18 for either party in principle to get in touch and say  
 19 how about a renegotiation?

20 MR NOBLE: Yes, exactly. There is a --- there are formal  
 21 mechanisms that clearly existed that will entitle  
 22 parties to do that, but I think the --- as I understand  
 23 the evidence, there are potentially other instances that  
 24 could have been contemplated where parties might have  
 25 then engaged in a renegotiation. Even if they were not

138

1 contractually entitled to, you know, this appears to be  
 2 an industry where it is the norm that you do not simply  
 3 set a rate and then stick with that rate for evermore.

4 You know, there is an updating process that has gone on.  
 5 MR RIDYARD: Yes. Is there agreement between you on at  
 6 which points in time Qualcomm's market power was, you  
 7 know, at its highest and lowest? Is that something  
 8 where you may be, Dr Padilla ---

9 DR PADILLA: Before getting to that, may I respond to what  
 10 Mr Noble has been saying?

11 MR RIDYARD: Sure.

12 DR PADILLA: So I think that my understanding, and I must  
 13 say that I am just an economist, but my understanding of  
 14 the negotiation is that there is a meeting of the minds  
 15 and the two parties decide to renegotiate and there is  
 16 a difference between renegotiate and unilateral breach.  
 17 These are long-term contracts, these licensing  
 18 agreements, and licensing agreements are long-term  
 19 contracts because they are not renegotiated on  
 20 a day-by-day basis, month-by-month basis or on a yearly  
 21 basis and if they are extended, renewed or renegotiated  
 22 it is because there is a meeting of the minds.

23 The second point I would like to make is that,  
 24 again, to be checked by the Tribunal because I may be  
 25 talking about facts and I am not the best person there,

139

1 but my understanding is that Qualcomm's position is that  
 2 provided that the licensee continues paying, it can  
 3 renegotiate. It can even challenge and it will not be  
 4 disrupted in its supply of chipsets. In fact, it  
 5 appears --- and this is a fact --- that that was the case,  
 6 even when the licensee, in this case Apple, decided not  
 7 to pay or instructed its contract manufacturers not to  
 8 pay.

9 MR RIDYARD: Is there not some tension there between your  
 10 two statements because, if that is the case, Apple or  
 11 Samsung could re-open negotiations on the royalty rate  
 12 at any point, given that they are assured supply?

13 DR PADILLA: Well, I think that that means that they are  
 14 breaching the contract and of course then they can  
 15 breach the contract and ---

16 MR RIDYARD: Then there would not be assured supply of  
 17 chipsets?

18 DR PADILLA: They would have supply --- sorry, if they  
 19 renegotiate and continue paying, I do not see any  
 20 problem there. I think that that would simply mean that  
 21 there would be a renegotiation or they would be  
 22 challenging the royalty, but there would be supply and  
 23 they would have the option to renegotiate or to, you  
 24 know, revise that royalty without discontinuation of  
 25 supply. If they breach, and Qualcomm decided not to

140

1 enforce, it could have applied the Chipset Supply  
 2 Practice and not supply. It did not. But I think that  
 3 my point remains, which is that, first, these are  
 4 long-term contracts. Second, I believe that they can be  
 5 challenged and provided that payment is made, in other  
 6 words, that you continue to be licensed, you are going  
 7 to be supplied.  
 8 So I think that those are important points because  
 9 that basically means that all those interim situations  
 10 are just meaningless, are, you know, they do not — they  
 11 do not materialise in practice. So the renegotiations  
 12 happen when the contracts are about to expire and that  
 13 is my experience in this industry. Not that you have  
 14 renegotiations on a constant basis, it is that  
 15 some years before, a year before, a year and a half  
 16 before the contract is going to expire, the parties  
 17 enter into a negotiation in order to extend it or modify  
 18 it.  
 19 MR RIDYARD: Mr Noble, do you have any observations?  
 20 MR NOBLE: I guess part of this is about contract law, as  
 21 opposed to economics, about, you know, is it a breach to  
 22 seek a renegotiation?  
 23 MR RIDYARD: Yes. There are limits to what we can get to  
 24 the bottom of here.  
 25 MR NOBLE: Yes, but I think conceptually it is — assuming

141

1 the answer — it may be that the law gives us a complete  
 2 answer to that question, but it certainly seems to me  
 3 that it is the generally accepted approach in this  
 4 industry that people can approach parties with which  
 5 they have a contract and seek — you know, the world has  
 6 moved on, technology has evolved, the market position of  
 7 that participant has changed quite significantly. In  
 8 those kinds of circumstances, the way I understand the  
 9 behaviour generally, not just of Apple and Samsung, but  
 10 lots of other OEMs is that there are conversations that  
 11 happen and there are then either voluntary  
 12 renegotiations or people potentially maybe they do tear  
 13 up a contract. I guess it depends on the nature of the  
 14 contract and the specifics of it, but I think that is  
 15 why, you know, I do not think a minute-by-minute  
 16 assessment of market power is necessary, but I do think  
 17 it useful to have a period-by-period assessment of it to  
 18 check the logic of the theory of harm to assess whether  
 19 or not there are significant periods in which Qualcomm  
 20 is or is not dominant.  
 21 THE CHAIR: What periods are you thinking of, if not at the  
 22 point of negotiations?  
 23 MR NOBLE: Well, in a sense, when one is thinking about the  
 24 other OEMs that aren't Apple and Samsung, you know,  
 25 there is a whole raft of dates out there of — and so,

142

1 in a sense, you could say, well, even if it just the  
 2 negotiations, we need to think about other dates when  
 3 other negotiations happen. So that is going to tick off  
 4 a lot of the years anyway. There may be other moments  
 5 when parties could have engaged in a negotiation but  
 6 chose not to and so that is the logic.  
 7 DR PADILLA: The problem that I think we would face in that  
 8 scenario is, well, first, I do not think that any of us  
 9 has done that analysis. I do not think that we have  
 10 looked at all those intermediate points of negotiation,  
 11 look at the OEM, consider what were the options that it  
 12 had — that OEM had in terms of chipsets and understand  
 13 the scope of the negotiation. So I think that that  
 14 would have to be done anew.  
 15 THE CHAIR: Let us have a ten-minute break now.  
 16 (3.17 pm)  
 17 (Short Break)  
 18 (3.33 pm)  
 19 MR RIDYARD: Moving on. I wanted to ask some questions  
 20 about how we interpret the evidence that we have about  
 21 Apple and Qualcomm's actual purchases from — sorry,  
 22 Apple and Samsung's actual purchases from Qualcomm. If  
 23 we take the case of Apple first of all, because we have,  
 24 you know, quite — a relatively clear picture of sort of  
 25 buying all of its requirements from Qualcomm and then

143

1 almost none and then all of it again. So in — let me  
 2 put the easy question: in the periods where Apple buys  
 3 nothing from Qualcomm, is it obvious that Apple has no  
 4 market power over Qualcomm in those periods?  
 5 MR NOBLE: In the context of the bilateral engagement  
 6 between the two of them?  
 7 MR RIDYARD: Yes.  
 8 MR NOBLE: It is certainly a signal that Apple has credible  
 9 alternatives, if we are thinking in the context of  
 10 a royalty, the outside options and so on.  
 11 MR RIDYARD: It is a pretty good signal, is it not?  
 12 MR NOBLE: Yes, it is a pretty good, signal because they  
 13 felt comfortable to move away. Obviously it is not a  
 14 perfect signal, because they may have felt that they had  
 15 to compromise on quality because it is, as I think we  
 16 were alluding to earlier, an oligopoly where — so they  
 17 may have had to trade down.  
 18 MR RIDYARD: Could have been costly for them to exercise  
 19 that option?  
 20 MR NOBLE: Yes, precisely. That is a good way of phrasing  
 21 it.  
 22 MR RIDYARD: Then in the period — I am assuming,  
 23 Dr Padilla, you do not disagree with that particularly.  
 24 In the periods when Apple buys 100% from Qualcomm,  
 25 I think how do we — obviously that is consistent with

144

1 them being completely dependent on Qualcomm, but it is  
2 also consistent with them just deciding to buy from  
3 Qualcomm when they could have bought from someone else,  
4 just as if I was buying printer paper or something I buy  
5 all my requirements from one supplier at any point in  
6 time, but there could be six different suppliers I could  
7 buy from.

8 MR NOBLE: Yes, and I think that is why it is important to  
9 step back and look at what are those credible  
10 alternatives. To take your example, there are periods  
11 when in a sense Qualcomm is the only game in town on  
12 LTE-CDMA and so Apple buys 100% of its LTE-CDMA  
13 requirements from Qualcomm in those time periods, but it  
14 is buying significant volumes of LTE-UMTS from Intel in  
15 those time periods.

16 So obviously, as you say, it is consistent with the  
17 fact that they do not have very good or very credible  
18 alternative options for the amounts that they are buying  
19 from Qualcomm, but one needs to look --- in a sense, you  
20 go back to the market definition analysis and think,  
21 well, what is the product that they are buying, what are  
22 the other options available to them in that market, how  
23 good a substitute are they, you know, are they having to  
24 make quality trade-offs? Obviously if Qualcomm has 100%  
25 market share in that market, then they do not have any

145

1 alternatives other than not buying that thing, but if  
2 Qualcomm has a less than 100% share, then one needs to  
3 look carefully at the quality of those alternative  
4 options.

5 MR RIDYARD: You just have to look at the messy facts in  
6 those periods and form a view?

7 MR NOBLE: Yes, I think so.

8 MR RIDYARD: Dr Padilla.

9 DR PADILLA: So broadly in agreement, but I think it is  
10 important that we consider which decision from Apple and  
11 Qualcomm we are focusing on.

12 So are we looking at the chipset market and the  
13 chipset prices that Apple paid at different points in  
14 time, or are we looking at Apple's bargaining power when  
15 negotiating royalties? There is a fundamental  
16 difference in that connection because for the mechanism  
17 that Mr Noble has described, this indirect exploitation  
18 mechanism, you need to be able to leverage dependency on  
19 chipsets in the royalty negotiation.

20 Now, my opinion, as expressed in my fourth report,  
21 is that what Qualcomm could do and the options available  
22 to Apple were independent of Qualcomm's share in the  
23 market or share with respect to Apple's chipset  
24 purchases. The reason is that Apple was licensed all  
25 the time through the contract manufacturers and so the

146

1 worst case scenario for Apple was to say, "Look, I am  
2 not taking the licence, but I am going to still get  
3 supply because I have --- I am licensed effectively  
4 through the contract manufacturers and the only thing  
5 that is going to happen is that for the duration of the  
6 dispute, instead of paying a lower royalty, I will be  
7 paying a somewhat higher royalty, which imposes a cost,  
8 but it is not existential.

9 MR RIDYARD: Right. I mean, that sort of assumes away the  
10 whole case, does it not? You might be right of course,  
11 but ---

12 DR PADILLA: Yes.

13 MR RIDYARD: --- it is only interesting to have this  
14 discussion if we think there is some ability to withhold  
15 chipsets as a way of exerting some bargaining power.  
16 I am not asking you to accept that proposition, but,  
17 I mean, if you were to win that argument, we can ---

18 DR PADILLA: So if we are thinking of restricting attention  
19 to the chipset market, the question is, and, again, we  
20 need to look at different points in time, so we could  
21 look at, you know, the point of where the market  
22 share --- Qualcomm's market share in the market is  
23 highest, which is I think at around 2013.

24 MR RIDYARD: So we are looking at figure 5 of your report?

25 DR PADILLA: Figure 5 where you have both lines, the blue

147

1 and the red.

2 MR RIDYARD: Opus page 78.

3 DR PADILLA: Now, that is a fairly transient position, as  
4 you can see in terms of market shares, which means that  
5 soon after 2013, in fact during that year, Qualcomm  
6 starts losing market share. It loses market share  
7 fundamentally to MediaTek. Also, you know,  
8 fundamentally to MediaTek. Again, I think that this is  
9 production, not capacity. If the prices were very high,  
10 it would have lost an awful lot more {POE/22/78}.

11 If we take a view restricted to the chipset market  
12 and we focus on the standard notion of dominance, which  
13 is the ability to sustain market power for a sustained  
14 period of time, that was fairly transient and that is  
15 the peak. Everywhere else you have market shares that  
16 are high, but not that high and, again, remember this is  
17 production, it is not capacity.

18 MR RIDYARD: Mr Noble, do you want to come back on that?

19 MR NOBLE: Well, I think this goes back somewhat to the  
20 debate about market definition because I think, you  
21 know, if you go back to the Class Representative's table  
22 and you find tables with very high market shares, 100%  
23 some of the time, in LTE-CDMA, and I think --- if I have  
24 my dates right, I think quite a lot of what is happening  
25 on the red line in Dr Padilla's chart is actually other

148

1 players essentially competing in UMTS chipsets and so ---  
 2 MR RIDYARD: It is hiding the market leverage in CDMA?  
 3 MR NOBLE: Precisely. I do not know if we can get that up?  
 4 I have forgotten what that reference was.  
 5 MR RIDYARD: Which one?  
 6 MR NOBLE: This is the Class Representative's two-page note  
 7 on market shares.  
 8 MR WILLIAMS: {X/2.1} I think it is.  
 9 MR NOBLE: The last page {X/2.1/4}. No, sorry, the previous  
 10 page {X/2.1/3}. Yes, this one. So, yes, you have  
 11 a series of 100% for Qualcomm up until 2014 and then it  
 12 is still quite high after that, but it is obviously  
 13 going down. So it is painting a different picture but  
 14 in a sense in the UMTS segment there are alternatives.  
 15 There's a question mark about the credibility of them,  
 16 but you can tell that because the numbers are not 100%  
 17 any more, but in CDMA there are not alternatives  
 18 until 2015 and in a sense then the shares go down.  
 19 MR RIDYARD: Yes.  
 20 DR PADILLA: If I may, I would like to take you again to  
 21 figure 3 and figure 4 in my report. We have seen those  
 22 figures a couple of times and it is helpful.  
 23 MR RIDYARD: Can you remind me of the page number?  
 24 DR PADILLA: Page 54 and I believe it {POE/22/57}.  
 25 MR RIDYARD: Thank you.

149

1 DR PADILLA: So I would like to draw your attention if you  
 2 look, for example, at 2013. You take a vertical line on  
 3 both graphs in 2013, that will give you a clear picture  
 4 of the relative insignificance of CDMA for both Apple  
 5 and Samsung and, again, the mechanism that I was  
 6 describing before is you have --- somebody is trying to  
 7 exploit you there, there are not that many volumes, you  
 8 could be able to exert a disciplinary role by  
 9 transferring business to UMTS. It is a very, very small  
 10 volume of CDMA, especially at that point in time. It  
 11 grows, it keeps fluctuating, but at that point in time,  
 12 which is the peak that we saw in the aggregated market  
 13 share, it is very little. So I do not think that ---  
 14 there may be some hiding, but it is very, very small.  
 15 MR RIDYARD: But I can see that argument working when we  
 16 are --- if we are talking about straightforward market  
 17 power in the chipset market power to raise prices above  
 18 a competitive level, but if we are talking about power  
 19 to exert leverage on the FRAND prices by withholding  
 20 chipset supply, even if it is only --- make up  
 21 a number --- 15% of Apple's requirements, 10% of Apple's  
 22 requirements, it could still --- could it not still be ---  
 23 if it was a matter of cutting off supplies of those CDMA  
 24 chipsets, could that still not be extremely important to  
 25 Apple and extremely costly to Apple to say, "Well, we

150

1 can no longer service that part of the market?"  
 2 DR PADILLA: As opposed to whatever inflated royalty 100% of  
 3 its volumes for a very large number of time? It is  
 4 an empirical question, but I do not think the CR has  
 5 presented any evidence in that regard.  
 6 MR RIDYARD: Mr Noble, do you have any comment on that?  
 7 MR NOBLE: I think there is a reference in RN9 where I talk  
 8 about the absolute numbers that we are talking about  
 9 here, because we are talking about many millions of  
 10 handsets, you know, that are at issue that are using the  
 11 CDMA networks. We are also talking about OEMs, I mean,  
 12 particularly Apple, its profit margin is around 50% on  
 13 its --- on its handset business and so if it is selling  
 14 a handset for \$600, \$700, \$800, then it is earning a lot  
 15 of money per handset and therefore losing out on a share  
 16 of sale --- a volume of sales of a figure exactly the  
 17 numbers, I am just trying to find them, tens of millions  
 18 of sales per year is going to be very, very valuable ---  
 19 very impactful for it and so it is the ability to deny  
 20 access to that market.  
 21 I think there is also a brand --- well, if I just  
 22 might finish. I think there is also a brand effect as  
 23 well that actually being unable to service a particular  
 24 type of customer may harm your brand in the longer run  
 25 as well, although I think the primary mechanism that

151

1 I am thinking of here is this is one of that you make  
 2 a lot of money per handset, you cannot make those  
 3 handsets any more, you potentially lose those sales.  
 4 THE CHAIR: Just before Mr Padilla interjects, is there  
 5 anywhere where you do any empirical analysis of the  
 6 extent to which the money that is --- would be  
 7 theoretically lost on CDMA compares with the gain that  
 8 you would make in the SEP market even?  
 9 MR NOBLE: Perhaps Dr Padilla --- I am just looking for that.  
 10 MR WILLIAMS: I think the reference Mr Noble is looking for  
 11 is paragraph --- I think it is paragraph 4.18 of his  
 12 ninth report, which is {POE/23/44}. I think that is the  
 13 reference he wants.  
 14 MR NOBLE: Yes, this was the one I was looking for.  
 15 THE CHAIR: All right. So that makes the point about the  
 16 volume of CDMA chipsets. Do you compare that with the  
 17 gains to be made in the SEP market?  
 18 MR NOBLE: I do not present a mathematical answer to the  
 19 comparison of the two, but, as I have said, Apple is  
 20 typically making very significant margins on its  
 21 handsets in the order of hundreds of dollars per handset  
 22 and so it seems intuitive to me that the kinds of  
 23 statements that they have made about the cruciality of  
 24 the CDMA market for them would create a strong incentive  
 25 for them to be willing to compromise in a royalty

152

1 negotiation.  
 2 MR RIDYARD: You would agree that the trade-off between  
 3 those two factors would be what counted here, the loss  
 4 of profit on the CDMA handsets not sold, against the  
 5 possible gain to the royalty payments, plus the ---  
 6 I mean, you did also mention of course the reputational  
 7 damage that might be suffered?  
 8 MR NOBLE: Yes. So I think there is a trade-off to be made  
 9 there. So I think it does mean that in a sense there is  
 10 not an unlimited overcharge that you could levy for  
 11 this, but that is common. I think for me the question  
 12 is not: could Qualcomm just extract any rent from  
 13 players, like Apple and Samsung?  
 14 MR RIDYARD: Sorry, I was --- in my question I think I moved  
 15 away from the pricing question and I am now talking  
 16 about the actual ceasing of supply of chipsets. So we  
 17 are not --- we are not talking about coping with an  
 18 increased cost: we are talking about non-availability.  
 19 I mean, is that not the leverage that is --- that  
 20 motivates the CR's theory of harm?  
 21 MR NOBLE: So, so it is not being able to make these sales  
 22 and then potentially losing very large amounts of  
 23 profit.  
 24 DR PADILLA: So let us think a little bit about that  
 25 calculation. So suppose that we only had UMTS and UMTS

1 was, you know, and Qualcomm was serving 100% of UMTS and  
 2 there are no authorities and the CMs are not licensed.  
 3 The contract manufacturers are not licensed so let us  
 4 put ourselves in that position. A threat to withhold  
 5 100% of supply of chipsets would be a very credible  
 6 threat. It would be a very credible threat because you  
 7 are losing the margin of that 100% and that is going to  
 8 be very significant and it is going to allow whoever  
 9 withdraws that to increase the royalties significantly.  
 10 Now, let us suppose that instead of withdrawing  
 11 100%, we withdraw 0.1% of the demand of Apple. So let  
 12 us assume that CDMA exists now and it represents 0.1% of  
 13 its sales. Withdrawing 0.1% of its sales is not going  
 14 to achieve much in terms of an overcharge in terms of  
 15 the royalty because that will be an overcharge that  
 16 applies to all the volumes. Mostly likely what will  
 17 happen is that the company will say, "Okay, I do not  
 18 sell 0.1% of my phones".  
 19 There must be a point in between that means that  
 20 there is credibility or not credibility. Paragraph 4.18  
 21 in Mr Noble's ninth expert report talks about absolute  
 22 figures, 80.5 million units, and that looks like a very  
 23 large figure. I think it is a large figure.  
 24 MR RIDYARD: Please be careful with the numbers.  
 25 DR PADILLA: Sorry, excuse me for that, but if we think in

1 terms of percentages, it is a very small percentage and  
 2 that is what I indicated by reference to figures 4 and  
 3 5. I do not have the numbers on top of my head and  
 4 maybe I should not even disclose them, but they are very  
 5 small.  
 6 MR NOBLE: I think the point I would make is it is --- one  
 7 should not simply compare those two numbers because what  
 8 we talk about when we talk about denial of supply is  
 9 that millions of handsets potentially do not get sold  
 10 and that means that potentially --- well, let us just say  
 11 1 million handsets. If you are earning \$100, you know,  
 12 that is 100 million of lost profit from that 1 million  
 13 handsets that you have just lost.  
 14 So it might represent, say, 10% or 20% of your  
 15 sales, but one then needs to consider, well, how does  
 16 that compare to the size of the royalty overcharge that  
 17 is being alleged here and I do not know if I am allowed  
 18 to say how big that is? I am just pausing.  
 19 THE CHAIR: I mean, I think the question was not what are  
 20 the figures, but had you done the empirical analysis and  
 21 your answer is that you had not done empirical analysis.  
 22 No, that was all my question was directed at. Thank  
 23 you.  
 24 MR RIDYARD: I think that has been useful, but I think  
 25 probably we have taken that as far as it is useful to do

1 here.  
 2 Maybe we could switch focus now on to Samsung, where  
 3 their pattern of purchasing is somewhat different  
 4 because it is less extreme, is it not, in that it is  
 5 always buying a reasonable chunk from Qualcomm, but then  
 6 it does not go to the hundreds or does not go to the  
 7 zeros either?  
 8 Is there anything --- obviously that is partly  
 9 a function of the much wider product range that they  
 10 have and just the way they do business, I guess, but is  
 11 there anything do you think different about what that  
 12 tells us about Samsung's buyer power compared to Apple  
 13 or is it just something that just is explained by more  
 14 mundane facts about how they do business?  
 15 MR NOBLE: Some of it may be related to mundane facts about  
 16 how they do business. I mean, one of the less mundane  
 17 facts, I think, is that I understand from some of the  
 18 evidence that they have a strong commitment to  
 19 multi-sourcing and so in a sense one would expect that  
 20 they would not give all their volume to one entity. We  
 21 can observe from Apple's chosen behaviour that they have  
 22 a desire for it, but it appears not so strong that they  
 23 are not willing to deviate from that, because they do  
 24 single-source at times.  
 25 So there is a multi-sourcing element to this, but

1 I think the other point that is worth bearing mind,  
 2 I think, is because of that wide range of handsets, it  
 3 may mean that for different groups of the handsets it  
 4 regards different suppliers as more credible for one  
 5 tier of its phones and other suppliers as less credible  
 6 for those tiers of its phones. So for any particular  
 7 set of group of handsets within that, it may be making  
 8 different purchasing choices. Then of course what we  
 9 observe is the total of all of that in the data.  
 10 MR RIDYARD: Yes.  
 11 DR PADILLA: I tend to agree with that and the only thing  
 12 that I would add is that, however, we need to be careful  
 13 when drawing inferences from single-sourcing and  
 14 multi-sourcing in terms of buyer power. Oftentimes  
 15 a strategy to increase your buyer power is to  
 16 multi-source, but that means that the people that  
 17 single-source, maybe they are very, very confident in  
 18 their purchasing power and they do not need to  
 19 multi-source because they are able to, you know,  
 20 organise competition for the slot, cut-throat  
 21 competition for the slot, and instruct very significant  
 22 rebates.  
 23 MR RIDYARD: Just looking at the charts, you could  
 24 interpret either chart in either direction actually.  
 25 I can see that.

1 I wanted to ask you about this notion of the  
 2 unavoidable trading partner. I know it is a sort of  
 3 term of art in the law, but is it — in terms of the  
 4 economics, is that a useful concept and, if so, what  
 5 does it mean?  
 6 DR PADILLA: Personally I think that it is ill-defined,  
 7 asking excuses towards the lawyers in the audience. It  
 8 is not clear to me what they mean and they can mean many  
 9 different things. They can mean it is a product that is  
 10 an input that you need in order to sell a given product,  
 11 or it is a product that you do not have, you not only  
 12 lose the volumes of that product but you lose your  
 13 entire business.  
 14 So I think it is somewhat ill-defined, but in the  
 15 context of this particular case, what it seems to me  
 16 that it means is that Qualcomm has such a product,  
 17 such — the chipsets of Qualcomm are such that they can  
 18 bring Apple and Samsung to their knees. If they do not  
 19 have access to the chipsets, their business is  
 20 fundamentally affected. It is so significantly affected  
 21 that they are willing to pay, you know, very high  
 22 royalties over their entire volumes.  
 23 That I think requires not only dominance, it  
 24 requires an absence of alternatives and an absence of  
 25 alternatives, even if those alternatives are of lower

1 quality. That has to be an existential threat, it seems  
 2 to me.  
 3 MR RIDYARD: Mr Noble.  
 4 MR NOBLE: I mean, I do not comment on precisely what the  
 5 law interprets —  
 6 MR RIDYARD: I am not asking that. I am asking whether as  
 7 an economist, you can give us some helpful guidance on  
 8 how we should be dealing with this concept.  
 9 MR NOBLE: I think when — if we go back to the market  
 10 definitions, I think if we observe that Qualcomm has  
 11 100% market share in a particular segment, then I think  
 12 one could characterise that as a signal about them being  
 13 an unavoidable trading partner, because if you wish to  
 14 be active in that segment, then you have to trade with  
 15 them because there are no other suppliers in that  
 16 segment.  
 17 It is also possible that even with less than that  
 18 share, they might also be an unavoidable trading  
 19 partner, because I mean this goes back to the role of  
 20 quality that actually the quality delta between Qualcomm  
 21 and the other entity or entities in that segment or in  
 22 that market could be such that it is in a sense  
 23 unavoidable that you are going to give a significant  
 24 volume of your sales to Qualcomm and there may be some  
 25 degree to which you vary that, which is why I think it

1 is a slightly different question than the question about  
 2 market definition, because it could be that you  
 3 discipline them via reducing the share that you give  
 4 them, but it may be that you are not comfortable taking  
 5 that share down to zero and, in that sense, it is  
 6 unavoidable that you are going to give some of your  
 7 business to that particular entity.  
 8 MR RIDYARD: In that scenario, are we saying so then  
 9 unavoidable trading partner, but it is not giving  
 10 them — it is or is not giving them leverage —  
 11 MR NOBLE: It is certainly consistent with them having  
 12 leverage because then if there is this sort of assured  
 13 base of demand that you cannot take away from them or it  
 14 is very costly to take that away from them, then in  
 15 a sense that gives them a degree of leverage over you in  
 16 those negotiations, such that they might try and take  
 17 advantage of that.  
 18 MR RIDYARD: Let us explore that. Like I say, it is almost  
 19 inconceivable that I would buy nothing from this  
 20 supplier. I have to buy 10% of my requirements from  
 21 this supplier because it does something that nothing  
 22 else can do, but I could vary it between that 10% and  
 23 80% so I have those 70 percentage points of discretion.  
 24 MR NOBLE: Yes.  
 25 MR RIDYARD: Is that a situation where I am dependent on

1 that supplier or does my ability to vary the 70%, is  
 2 that a big enough stick or carrot, whatever it is —  
 3 MR NOBLE: It is a large stick and so, in a sense, you can  
 4 discipline them. I mean, I think one might say that  
 5 there is still a degree to which they can discipline you  
 6 with the 10% because they know, you know, as long as  
 7 both parties are aware that that really is the deal,  
 8 that there is this 10% that you cannot really take away  
 9 from them, there is a degree to which your stick is not  
 10 going to be effective or at least there is  
 11 a counter—stick available to them and so it then becomes  
 12 really a question of the trade—off between the size of  
 13 those two sticks.  
 14 MR RIDYARD: And therefore the cost of crossing the red  
 15 line?  
 16 MR NOBLE: Exactly. Obviously if one approaches the limit  
 17 that is an infinitesimally small amount of volume, well,  
 18 there is not a lot of difference between that and zero,  
 19 but when it becomes a significant share of your  
 20 business, then it is a serious question to answer.  
 21 MR RIDYARD: Dr Padilla, is that something you agree with?  
 22 DR PADILLA: Yes, but I would like to elaborate a little  
 23 bit. I would like to take it further. So, again, to  
 24 some extent, and you are going to recognise the author  
 25 of these two terms, there is a difference between an

161

1 essential facility and a convenient facility. The  
 2 essential facility is essential. If you do not have it,  
 3 you cannot produce. If you do not have access, if the  
 4 chipsets of Qualcomm were essential, then Apple and  
 5 Samsung would surrender in the negotiations, assuming  
 6 everything else about contract manufacturers, etc.  
 7 If what Qualcomm has is convenient, then it is not  
 8 clear, because one would have to think about what would  
 9 be the sacrifice of substituting away from Qualcomm to  
 10 an alternative etc and then one would need to do, and,  
 11 again, a cost benefit analysis. Such cost benefit  
 12 analysis is not available to the court. It has not been  
 13 conducted by the CR and for the reasons that I have  
 14 stated before, because I think that actually it is  
 15 irrelevant given the situation with the contract  
 16 manufacturers, we have not provided it either.  
 17 MR RIDYARD: Okay. Thank you. That is helpful.  
 18 I just wanted to refer to a couple of specific  
 19 points in the joint economic statement. This is perhaps  
 20 just jumping about a bit now within one topic to another  
 21 within this notion of market dynamics. Per 28.5 —  
 22 MR NOBLE: Which number?  
 23 MR RIDYARD: It is paragraph 28.5. Dr Padilla, you make  
 24 a comment, which I was a bit surprised at, and I just  
 25 wonder whether you might want to — you say:

162

1 "Because Qualcomm consistently undertakes R&D, that  
 2 is inconsistent with it having market power  
 3 effectively ."  
 4 {POE/24/16}. Is it your view that any firm that  
 5 undertakes significant R&D does not have market power or  
 6 is that a product of the word limit that was put on you?  
 7 DR PADILLA: So let us see. What is a dominance? Not just  
 8 market power, dominance? Dominance, ability to act  
 9 independently of your competitors, consumers, etc.  
 10 Independent in what dimensions? On the dimensions in  
 11 which you compete. You compete on prices, but you  
 12 compete on quality. You compete in development. What  
 13 is that that you would expect — what is that you would  
 14 expect from an idle monopolist? You would expect  
 15 idleness. If I keep investing massive amounts of money,  
 16 I am not idle.  
 17 MR RIDYARD: What about a ruthless monopolist though?  
 18 DR PADILLA: Ruthless in what sense?  
 19 MR RIDYARD: In the sense of maximising my profits and  
 20 making the most of my monopoly position at every point  
 21 in time.  
 22 DR PADILLA: Again, the question is if that ruthless  
 23 monopolist would exploit its position but would not  
 24 invest. It would give the money, all those rents, to  
 25 its shareholders.

163

1 MR TURNER: Why does a monopolist not want to secure its  
 2 dominance for the future?  
 3 DR PADILLA: Oh and that is interesting. If it needs to  
 4 secure its dominance in the future, it is not dominant.  
 5 MR TURNER: Well, no company is dominant forever, unless you  
 6 can give me an example.  
 7 DR PADILLA: There are companies that are dominant for very  
 8 long periods of time —  
 9 MR TURNER: Maybe long periods of time.  
 10 DR PADILLA: — because they have a legal monopoly or  
 11 because they enjoy a de facto standard.  
 12 MR TURNER: Is it not readily understandable that  
 13 a monopolist might be enjoying its monopoly position,  
 14 enjoying the excessive profits it is making and wanting  
 15 to make sure it is going to be in the same position  
 16 ten years from now?  
 17 DR PADILLA: But then it is not a monopolist, because it is  
 18 defending its position by investing.  
 19 MR TURNER: Dominant then. It is certainly dominant.  
 20 DR PADILLA: I am going to use an example which I am not  
 21 particularly fond of but is a common example that has  
 22 been used, which is Microsoft browsers. I am not  
 23 particularly fond of it because I defended Microsoft in  
 24 that case so I think I take it as a loss, but what  
 25 happened there is you see the period in which Microsoft

164

1 was competing with Netscape significant improvements in  
 2 Internet Explorer, new launches continuously. It  
 3 acquires a monopoly position and regards that it has ---  
 4 that monopoly position is protected by network effects.  
 5 No launches of new versions of Internet Explorer.  
 6 What happens as soon as there is entry again by  
 7 Firefox and Chrome? Again, investments.  
 8 All this does not correlate much with the market  
 9 shares. It correlates with the existence of competitors  
 10 or not. So even if Firefox and Chrome were relatively  
 11 small, the competitive pressure that they exerted forced  
 12 Microsoft to invest and innovate because it had to  
 13 protect its position, but it had to protect its position  
 14 so it was no longer dominant.  
 15 MR TURNER: Are you saying there are long periods when  
 16 Microsoft did not invest and innovate?  
 17 DR PADILLA: There are long periods where it did not invest  
 18 in the browser, yes.  
 19 THE CHAIR: Are you not conflating the question of dominance  
 20 and monopoly?  
 21 DR PADILLA: I was taking the extreme example for  
 22 illustration. A dominant company is a company that can  
 23 act independently of competitors, customers and clients.  
 24 What I am saying is that acting --- the word "acting"  
 25 refers to the dimensions of competition. You compete in

165

1 prices and you compete in non-prices. In fact, if you  
 2 do not keep investing in chipsets, your position in the  
 3 market declines very, very quickly.  
 4 MR TURNER: But take the pharmaceutical industry, for  
 5 example. It is well-established that companies that  
 6 have a dominant position in a therapeutic area, perhaps  
 7 because of a patent monopoly, will invest very, very  
 8 heavily in that technology. They do not sit back and  
 9 just take the profits. They invest very heavily in that  
 10 technology and file many, many, many more patents ---  
 11 there is even a term for it --- to extend the monopoly  
 12 beyond what they otherwise would have or their  
 13 dominance, and we can use either, well into the future  
 14 and at the moment I am having some difficulty with your  
 15 proposition that as soon as somebody is in a dominant  
 16 position, they sit back and put their feet up. They  
 17 might, but ---  
 18 DR PADILLA: So a pharmaceutical company for a period of  
 19 time, due to patent protection, enjoys some market  
 20 power. In the investment that they make typically ---  
 21 I mean, and actually those that are not regarded as  
 22 anticompetitive, which are those extending the patent in  
 23 an unfair or an abusive way, their investments tend to  
 24 be about monopolising other markets, about developing  
 25 the next blockbuster. So they invest in many, many

166

1 different product lines in order to continue their  
 2 business in other activities, but it is not about  
 3 investment --- continuous investment in the market  
 4 because if I have developed, say, Ozempic or, you know,  
 5 that is it. I think that I have that product and I am  
 6 going to obtain rents on that product.  
 7 MR TURNER: That just not right, is it? People develop in  
 8 delivery systems, they develop improvements, variations  
 9 on the molecule, they look at different formulations,  
 10 different doses, different applications for the drug,  
 11 new indications. I mean, that is not just ---  
 12 DR PADILLA: When they do that --- but if they do that, then  
 13 I would tell you they are competing. They are competing  
 14 to maintain a position of leadership once the patent ---  
 15 the patent --- the molecule patent expires.  
 16 THE CHAIR: So we have your position on that. Does Mr Noble  
 17 want to comment?  
 18 MR NOBLE: I mean, I think for me --- I mean, I think  
 19 Dr Padilla's outlining what one might term the dynamic  
 20 competition school of thought in terms of if you see  
 21 material levels of R&D, then that may be enough to make  
 22 you comfortable. I think there is a question mark about  
 23 whether that is the right way to think about markets in  
 24 general, but I do not know how relevant that is to this  
 25 particular case because --- and this is goes back to the

167

1 exchanges we had earlier on about where is it that the  
 2 CR is alleging you take your rent, because the dynamic  
 3 school of competition makes a lot more sense, and there  
 4 is a debate about whether it makes sense at all, but it  
 5 is much more coherent in the world that you take your  
 6 rent in the product that is --- that has R&D in it,  
 7 because you create an incentive for other people to do  
 8 that R&D and it is essentially an R&D rate is what you  
 9 are engaging in there.  
 10 But it does not make as much sense in the context of  
 11 this case where you have one product, where the Class  
 12 Representative's case is there is market power, but then  
 13 you are taking the rent somewhere else, that is not that  
 14 product.  
 15 DR PADILLA: The relevance, if I may, is the following, and  
 16 this does not require that you agree with my perhaps  
 17 extreme interpretation before: the relevance is if  
 18 Qualcomm is investing continuously in R&D, it is because  
 19 it fears that if it does not do so, it going to lose its  
 20 position vis-à-vis somebody else. That somebody else  
 21 may be in the market or maybe an entrant. That is  
 22 telling you the fact that it is investing this very  
 23 significant amount of money in terms of R&D of revenue,  
 24 this is a brutal amount of money and keep coming up  
 25 continuously with new products is because there are

168

1 alternatives. If there were no alternatives, it would  
 2 not have to do that and that is an indirect indication  
 3 of the existence, availability and credibility of those  
 4 alternatives.  
 5 MR RIDYARD: You have made your position clear.  
 6 This is jumping around, but, Mr Noble, maybe this  
 7 one is best addressed to you. If we look at the current  
 8 situation with Apple and 5G chips, and we understand  
 9 that they have now — this is beyond the period of the  
 10 claim and so forth, but just to understand the kind of  
 11 economics and the dynamics of the industry a bit better,  
 12 I mean, assuming Apple is now able to produce its own 5G  
 13 chips, I mean, it is now — is it fair to assume that it  
 14 is now no longer dependent on Qualcomm?  
 15 MR NOBLE: It is certainly less dependent. I think there is  
 16 a question mark because, and, again, I am not sure I am  
 17 fully up to speed on the facts on this. My  
 18 understanding is that it is a relatively recent  
 19 development that they have launched a phone with their  
 20 own self-supply chipset and I think it is true that  
 21 Qualcomm is still supplying chipsets for some of its  
 22 phones and my understanding of the media reporting about  
 23 this is that the — that Apple's self-supply chipset  
 24 goes in a sort of lower tier of its phones and it uses  
 25 the Qualcomm chipsets in the upper tier of its phones.

1 So it is certainly true that it now — it  
 2 demonstrably has a self-supply option. The question is  
 3 how credible that option is relative to in a sense  
 4 getting rid of Qualcomm completely.  
 5 MR RIDYARD: I would like you to comment about the timing of  
 6 that too because when it comes to the other side, you  
 7 make this point about respective market power even  
 8 though in 2018 it might not have — it was not buying 5G  
 9 chips, it was looking forward and I understand that  
 10 point. Does the same thing apply here, when the boot is  
 11 on the other foot, where they are looking forward and  
 12 thinking, well, in six months' time, two years' time,  
 13 I will have my own supply, therefore I will be freed  
 14 from dependence on Qualcomm? I mean, at what point did  
 15 that kick in in the — does that prospective market  
 16 power work in the other direction as well?  
 17 MR NOBLE: Yes. I mean, I think conceptually it should be  
 18 symmetric, in that in the logic that if Apple were to  
 19 feel comfortable that it would no longer be dependent,  
 20 but I think that then depends on what would happen if it  
 21 used that feeling, that knowledge, that insight, because  
 22 if it is the case that, say, today, it is currently  
 23 self-supplying some chipsets and buying some Qualcomm  
 24 chipsets, if it felt very assured of the supply of those  
 25 Qualcomm chipsets, then it might feel comfortable —

1 well, if it felt that it was paying a too high royalty,  
 2 it might launch a FRAND challenge or do something like  
 3 that. If, however, it was not feeling assured about  
 4 that, it might hold back until such point as it had  
 5 essentially moved itself fully away, which is  
 6 essentially the narrative of what happened in — when it  
 7 did launch a FRAND challenge, that it appears to have  
 8 prepared itself to be — that all new phones would be on  
 9 non-Qualcomm chipsets and it then took — had taken  
 10 steps to prepare itself that it could guarantee the  
 11 supply of the old phones as much as it could via the  
 12 CMs, via supply commitments, and so it has hedged its  
 13 risk by doing that because obviously it may be that it  
 14 was 100% assured of receiving all those Qualcomm chips  
 15 on the legacy handsets, but it has mitigated that risk.  
 16 If it was wrong, if it made a wrong judgment call,  
 17 it turns out for whatever reason Qualcomm did withhold  
 18 them or partially withheld them, it has something in the  
 19 market. It has the new handsets that it is selling and  
 20 so it is not ideal for Apple to then potentially have to  
 21 withdraw its older handsets, but it has a relatively  
 22 short product cycle.  
 23 So that would certainly mitigate its risk.  
 24 So I am not sure it is completely symmetric in that  
 25 regard, because it really depends on the facts about

1 could or would Qualcomm actually withhold chipsets.  
 2 I know there are factual disputes between the Class  
 3 Representative and Qualcomm about whether that is in  
 4 fact something that could have or would have happened.  
 5 MR RIDYARD: Any comment on that, Dr Padilla?  
 6 DR PADILLA: No, other than I am confused. I am confused  
 7 about his explanation. I do not follow it.  
 8 MR RIDYARD: Okay. Well, if you are confused, that is —  
 9 DR PADILLA: I am confused because I think that what I have  
 10 heard is expectations of the future matter, but it only  
 11 matters in one direction and not in the other and I do  
 12 not see exactly how that could be the case. There is  
 13 a lot of speculation as to how Apple would feel, how  
 14 Qualcomm would feel, and I am not sure exactly what to  
 15 make about that in the sense that I cannot tell you,  
 16 okay, on the basis of these facts, I believe that  
 17 Qualcomm has the ability to impose terms and conditions  
 18 or not.  
 19 MR RIDYARD: Thank you. That is all I have on this topic,  
 20 so, again, we will give opportunities for clarification  
 21 questions before we move on to the next topic.  
 22 MR WILLIAMS: I think I have one question, sir.  
 23 Mr Noble, you were asked by the President about  
 24 the — how the theory of harm works and why Qualcomm  
 25 would exploit its market power on the — in the SEP

1 market, rather than in the chipset market.  
 2 MR NOBLE: Yes.  
 3 MR WILLIAMS: Part of the discussion was about whether the  
 4 customer was the same in the chipset market and the  
 5 licensing market. So can I ask you to clarify what  
 6 happens in two scenarios. One is that Qualcomm puts up  
 7 the chipset price and the other is that it puts up the  
 8 royalty level and can I ask you who pays in those two  
 9 different scenarios? Who pays the higher chipset price  
 10 and who pays the royalty?  
 11 MR NOBLE: Sorry, can you --- it has been a long day. Can  
 12 you wind back a bit. What was the original question  
 13 that I was asked?  
 14 MR WILLIAMS: The question was from the President about  
 15 how --- about the theory of harm and --- sorry, Madam.  
 16 THE CHAIR: I do not really think that this is  
 17 a clarification question. It sounds more like  
 18 a re-examination question.  
 19 MR WILLIAMS: Right. Well, I did not want to cross a line,  
 20 Madam. I thought there was an issue that arose in the  
 21 discussion about the customer being the same on both  
 22 sides. That is all.  
 23 THE CHAIR: Is there something that you did not understand  
 24 from Mr Noble's response?  
 25 MR WILLIAMS: No, it is not something I did not understand.

173

1 THE CHAIR: All right. Then let us move on. Does anyone  
 2 else have a question?  
 3 MR RIDYARD: In that case, we will move on to the questions  
 4 about conduct and alleged abuse.  
 5 The first topic, which I think will be exceedingly  
 6 short, but I just wanted to run it past you, is this  
 7 notion of competition on the merits. Again, it is  
 8 a legal term, but I think my question would be: I mean,  
 9 is there anything that economic theory or your economic  
 10 expertise can contribute to help us to operationalise or  
 11 understand or utilise that concept?  
 12 Dr Padilla, do you want to comment? I will accept  
 13 an answer of "no" on this.  
 14 DR PADILLA: I can actually refer to a paper written  
 15 recently on that topic. So, first, I think that this is  
 16 a notion that is used, as far as I understand, in the  
 17 context of exclusionary abuses and in the context of  
 18 exclusionary abuses, at least the European Court of  
 19 Justice in (inaudible) says you need to prove that there  
 20 is no competition on the merits and then you need to  
 21 prove that there is consumer harm. When it looks at  
 22 what is competition on the merits, it uses at least two  
 23 tests. One is the replicability test. Can it be  
 24 replied or replicated by somebody without market power  
 25 and then there are alternatives.

174

1 Now, the problem with that notion here is that  
 2 I think that this is an exploitative abuse and in  
 3 a market where there is no competition, there is  
 4 bilateral bargaining between an OEM and the licensor.  
 5 So I am not sure exactly how to operationalise this in  
 6 this particular case. It seems to me that here we are  
 7 not talking about acting in a way that is not  
 8 competition on the merits; it seems to me that the  
 9 theory of harm is about leveraging market power to  
 10 extract rents from a counterparty, but there is no  
 11 exclusion whatsoever.  
 12 MR RIDYARD: Mr Noble.  
 13 MR NOBLE: I mean, section 6(b) of my eighth report does  
 14 talk about departure from the normal competitive process  
 15 and so I think that is my attempt to try and provide  
 16 some economic insight on this particular point and  
 17 I think the crux of it is at 6.12, which is {POE/21/83},  
 18 which is the extent to which physical supply of  
 19 components is a factor that is taken into account in  
 20 a typical cellular SEP licence negotiation.  
 21 That does not appear to be the norm in the industry.  
 22 MR RIDYARD: But, I mean, I suppose my query on that really  
 23 is there is no one else, apart from Qualcomm, who is a  
 24 serious player in SEPs and chipsets at the same time.  
 25 So is that just a function of the way Qualcomm happens

175

1 to operate or is it something more than that?  
 2 MR NOBLE: Well, it may be a function of that, or in a sense  
 3 it has to be a function of that, because there is not  
 4 anyone else that could do this and so, in a sense, the  
 5 uniqueness of it, I am not sure how --- whether that  
 6 really tells us the answer "yes" or "no".  
 7 Certainly what it does mean is if you think the  
 8 normal competitive process is about the features of the  
 9 products in that market being the things that determine  
 10 the outcomes in that market, then introducing something  
 11 from another market into that market is potentially  
 12 a departure from the normal competitive process.  
 13 DR PADILLA: Two comments there, if I may? So, one, I do  
 14 not think that that is a competitive process. I think  
 15 that that is a bargain but, having said so, I think that  
 16 one would have then to establish that Qualcomm has  
 17 indeed introduced that link. One would have to prove  
 18 that there have been threats. One would have to prove  
 19 that there have been actions of discontinuation.  
 20 I think that Mr Noble, correct me if I am wrong, I think  
 21 what you are saying is that that is not necessary that  
 22 what --- it is enough for Apple to have the feeling that  
 23 you could be exposed to that danger for the competitive  
 24 process to be distorted and, frankly, I do not  
 25 understand that. I cannot see the logic of that.

176

1 MR NOBLE: I think we are going to come on to some of these  
2 points when we come on to the bargaining model.

3 MR RIDYARD: Let us leave that. I think we have probably  
4 taken that one as far as it is useful.

5 The second point was, Dr Padilla, you mentioned  
6 exclusionary versus exploitative abuse. I just wanted  
7 to clarify, Mr Noble, to what extent is there a story  
8 here, in your view, about exclusionary effects in the  
9 chipset market arising from Qualcomm's conduct or does  
10 that play a part in this story or not? I was not sure  
11 how — what the position of that was in your analysis.

12 MR NOBLE: The RTL conduct, which is what I think you are  
13 referring to, is that right?

14 MR RIDYARD: Yes, yes, I suppose so.

15 MR NOBLE: So certainly, as I understand the Class  
16 Representative's pleadings, they do not plead that that  
17 is a standalone abuse. It is a buttressing behaviour.  
18 What I highlight in my report is that there are elements  
19 of that that potentially create barriers to entry or  
20 expansion in the context of the chipset markets, but  
21 I have not sought to try and analyse those as  
22 a stand-alone exclusionary abuse.

23 MR RIDYARD: Is that the case though, because it seems to me  
24 that — I mean, if I was in — if I was — if I was in  
25 the chipset business, it would be nice if I could sell

1 my chipsets to an OEM who did not have to pay any  
2 royalties because it would have lower costs and it would  
3 therefore be — give me more demand for my product, but  
4 that is the wrong kind of asymmetry, is it not? That is  
5 creating a distortion of competition if one OEM does not  
6 pay royalties while everyone else does.

7 MR NOBLE: Yes.

8 MR RIDYARD: So the RTL policy or Qualcomm's policies on  
9 licensing are really — are they not designed simply to  
10 make sure everyone, like or not like the royalties, but  
11 everyone pays them and that is more or less what are  
12 designed for, or is that an unfair characterisation of  
13 where they are?

14 MR NOBLE: Well, I mean, it is worth turning up {POE/21/49}.  
15 That is in my eighth report. So, I mean, this is where  
16 I explain three reasons why I consider that Qualcomm's  
17 RTL policy is likely to have acted as a barrier to entry  
18 in the chipset markets. So I do not know if — I will  
19 just go through each of the three. Is that useful?

20 MR RIDYARD: Briefly, yes, please.

21 MR NOBLE: Yes. So the first one is about the RTL policy  
22 creating an uncertain legal and commercial trading  
23 environment for chipset suppliers, because it is  
24 important to bear in mind what the Class Representative  
25 calls "RTL" It is not same thing as end-device

1 licensing. It is also the other ancillary activities  
2 that go around that, such as the non-assert agreements  
3 and the clauses that are contained within them. So if  
4 we look at footnote 141, we see some evidence here  
5 from — I do not know — I do not think this is  
6 confidential.

7 THE CHAIR: 141? It is not highlighted.

8 MR NOBLE: So it is Andrew Hong at Samsung indicating that  
9 the failure to obtain a licence from Qualcomm was one of  
10 the reasons why Project Dragonfly, which was a joint  
11 venture to develop and sell chipsets, did not proceed.  
12 Now, no doubt there will be other reasons why that did  
13 not proceed, but it is certainly consistent with the  
14 position that the RTL policy does create some degree of  
15 uncertainty for rival chipset makers.

16 Then the second reason is about in a sense  
17 restricting access to supply or, sorry, restricting  
18 access to the market. If we look at footnote 142, and  
19 I think this is confidential, that if you read the last  
20 line of that, it does talk about something that is  
21 consistent with that approach. (Pause)

22 MR RIDYARD: Yes, but it is also consistent with an approach  
23 that is trying to remove free riding from the industry,  
24 is it not? It is very hard to disentangle to get to the  
25 bottom of some of these.

1 MR NOBLE: Yes. I do not say that it is completely  
2 one-sided. I mean, I think what I am highlighting here  
3 is that the RTL policy does have the potential to create  
4 these kinds of barriers.

5 MR TURNER: You refer to the RTL policy as a buttress which  
6 is something I have heard and read on a number of  
7 occasions. The refusal to license, if that is an  
8 appropriate term, not licensing chip manufacturers,  
9 might equally be said to just be a state of affairs or  
10 the landscape under which you then have to go on and  
11 analyse other matters.

12 MR NOBLE: Yes.

13 MR TURNER: The term "buttress" suggests that there is  
14 abusive behaviour going on but it is not effective  
15 enough so I now need to do something to make it even  
16 more effective. I just understand what you mean by  
17 "buttress" and why you are using that term? Do you mean  
18 nothing more than the state of affairs?

19 MR NOBLE: Well, I do not know. I am a big fan of medieval  
20 architecture so I have an image of a flying buttress,  
21 but the way I use the term "buttress" is in a sense that  
22 there is something that Qualcomm has created which is  
23 the — on the theory of harm, which is it has a too high  
24 royalty rate for a chipset — sorry, for SEPs and the  
25 theory of harm is it gets there directly via leveraging

1 people that need those chipsets and it gets it  
 2 indirectly via setting benchmarks that are then used by  
 3 the industry and by courts, etc.  
 4 The whole edifice could come crashing down if it  
 5 were required to licence chipset manufacturers because  
 6 they do not need chipsets, they make chipsets, and so,  
 7 in that sense, it acts as a buttress. It is — because  
 8 the way I think of chipset manufacturers is almost  
 9 this — they are agents that act on the behalf of OEMs  
 10 to go and get them a good rate, because these guys are  
 11 immunised from having their supply cut off because they  
 12 do not want to buy chipsets.  
 13 MR TURNER: If you were determined to be abusive, why cannot  
 14 you just charge — I mean, I just have enormous  
 15 difficulty understanding what the factual situation is  
 16 that you are envisaging when, okay, you decide to  
 17 license the chip manufacturers. So the same thing start  
 18 arising as you can pretty much charge any price you  
 19 want, subject to your FRAND obligations. You are then  
 20 going to — let us assume, you are dominant in chips and  
 21 you are going to the manufacturer and saying okay — you  
 22 tell me where your analysis goes from there.  
 23 So who is making the FRAND challenge and how — what  
 24 possibilities are there for stopping that FRAND  
 25 challenge if you are the dominant chip supplier?

181

1 MR NOBLE: So, in that situation, if what has happened is  
 2 that there is two — so I think in your example you are  
 3 saying that a MediaTek, for example, has gone and sought  
 4 a licence from Qualcomm. Is that what you are  
 5 envisaging?  
 6 MR TURNER: Well, no, I really want to know what you are  
 7 envisaging. As I understand it, the term "buttress" has  
 8 come from you; is that right?  
 9 MR NOBLE: Yes.  
 10 MR TURNER: So you say that the abusive conduct — sorry,  
 11 I hope I am not paraphrasing you unfairly — but the  
 12 abusive conduct would not be effective if there was not  
 13 this refusal to license policy. It is part of — it is  
 14 a necessary ingredient.  
 15 MR NOBLE: Well, I do not know if it is necessary. I think  
 16 that is the critical point. That is all also true of  
 17 these medieval flying buttresses.  
 18 MR TURNER: That will not help me.  
 19 MR NOBLE: No, but in a sense what you need to be true is  
 20 you cannot bypass. That is the buttress, it is the  
 21 non-bypass. There are two ways to buttress the theory  
 22 of the NLNC behaviour. Method 1 is that actually  
 23 Qualcomm should have licensed all-comers, including  
 24 chipset makers. If that is true, then the RTL policy is  
 25 a buttress because it needs to stop those people being

182

1 able to undermine its ability to use chipset leverage  
 2 over OEMs, because it cannot use chipset leverage over  
 3 chipset manufacturers. So, you know, if the — if the  
 4 world should have involved the licensing chipset  
 5 manufacturers, then it needs to not do that.  
 6 If, however, the world is one where end-device  
 7 licensing is just the way of the world anyway, then in  
 8 a sense the buttress is already there. You do not need  
 9 to worry about the end-device licensing aspects of RTL  
 10 and the only aspect that is left of RTL, which is where  
 11 RTL is different from end-device licensing, is the fact  
 12 that Qualcomm appears to have used or at least the  
 13 evidence appears to signal that they got commitments  
 14 from some of the chipset manufacturers not to sell  
 15 chipsets to unlicensed OEMs and so that potentially  
 16 gives it control over more than just its own chipsets,  
 17 potentially gives it control over, you know, potentially  
 18 100% of the chipsets.  
 19 MR RIDYARD: Is that just not a commitment not to engage in  
 20 piracy?  
 21 MR NOBLE: Well, I do not know if it is a commitment by the  
 22 chipset manufacturer not to engage in that because if  
 23 they are not entitled to a licence, then what are  
 24 they — what rule are they breaching?  
 25 MR TURNER: But you still have a lot of the same problems,

183

1 do you not? You can charge a very high price for your  
 2 chips — royalty on your chips and you can still exert  
 3 pressure on the OEMs by refusing to supply and then one  
 4 gets into just another very complicated situation.  
 5 MR NOBLE: Well, I think the — let us imagine a world in  
 6 which we have end-device licensing. In a sense, a lot  
 7 of the RTL aspects cease being relevant because in  
 8 a sense those chipset manufacturers cannot act as that  
 9 bypass route anyway. I think that is perhaps one  
 10 simpler way to think of it, that this is a more direct  
 11 route to OEMs.  
 12 MR TURNER: But the chip manufacturer could make a FRAND  
 13 challenge and then Qualcomm could say to the  
 14 manufacturer, "If you are using chips which are subject  
 15 to a FRAND — which are — if your alternative supply is  
 16 now engaging in — seeking a FRAND determination by  
 17 arbitration or by litigation, if you are in that game  
 18 with these people, we are not going to supply you with  
 19 chips" and you are back in exactly the same situation  
 20 again.  
 21 MR NOBLE: Well, but potentially not for very long, because  
 22 in a sense the chipset manufacturer could sweat it out  
 23 essentially through a FRAND challenge. That is the  
 24 logic is that — because they are not selling handsets  
 25 and they are not reliant on Qualcomm for any particular

184

1 input and so unlike —  
 2 MR TURNER: Apple is going to stop buying their chips.  
 3 Apple say, "We are not going to buy your chips because  
 4 Qualcomm is going to cut off its supply to us and so we  
 5 can only make 30% of our phones. So, I am sorry, guys,  
 6 we will just have to go with Apple".  
 7 MR NOBLE: That would work if that particular OEM were  
 8 buying chipsets from that particular chipset  
 9 manufacturer, but, if they are not, then Qualcomm loses  
 10 that leverage.  
 11 So the basic idea of the economic idea of RTL is  
 12 that there is a set of incentives — or a set of  
 13 behaviours that Qualcomm could engage in via NLNC and  
 14 the logic of analysing dominance, etc, is to evaluate  
 15 whether or not it really does have that market power,  
 16 because if it does not have that market power, we can  
 17 all go home. If it does that have market power, we need  
 18 to think: well, did it actually do that? That is  
 19 a factual question about whether it actually engaged in  
 20 those kinds of behaviours.  
 21 The logic of the RTL part is to imagine a world in  
 22 which the chipset manufacturers almost — they  
 23 fundamentally undermine the logic of — sorry, of NLNC  
 24 and they do that by saying, "We do not care whether you  
 25 cut off chipset supply because we are going to sweat it

185

1 out. We do not make phones. We do not need your  
 2 chipsets in order to survive", whereas OEMs do, and  
 3 therefore we will — we then challenge your royalty  
 4 rate, we get a really low royalty rate and then we can  
 5 sell chipsets to OEMs at much lower prices, because the  
 6 way you are selling those chipsets is a chipset price  
 7 and a high royalty. They sell a chipset price at a low  
 8 royalty. That is the basic logic of the core of the RTL  
 9 aspect.  
 10 MR TURNER: You mention the theory of RTL. You are not  
 11 suggesting that the — there are other explanations for  
 12 the RTL, one we are being told about is there are  
 13 exhaustion issues. You are not saying anything —  
 14 you're not disagreeing with any of that?  
 15 MR NOBLE: No, I am not. I mean, in fact, at some level it  
 16 makes the analysis a lot simpler. In a sense, if  
 17 Qualcomm is right, those are good reasons, then in  
 18 a sense this bypass route does not exist anyway, because  
 19 the chipset manufacturers were not entitled to come and  
 20 make a FRAND challenge and, therefore, in a sense, this  
 21 bypass route may as well not exist.  
 22 The only part of — you then end up with this sort  
 23 of other bit of RTL which is this — the non—assert  
 24 part, the extent to which one might think that Qualcomm  
 25 used a threat of litigation against the chipset makers

186

1 as a disciplining mechanism to get them to almost act as  
 2 their deputies in the market and I forget exactly the  
 3 reference, but there is — I do not know if it is  
 4 confidential. There is a deposition from a chipset  
 5 manufacturer that says something along — in fact there  
 6 is an email, I think it is, where a chipset manufacturer  
 7 writes to Qualcomm and says, "We are very sorry, we have  
 8 realised that we have breached our commitment to you  
 9 because we have sold chipsets to an unlicensed OEM. We  
 10 wish to apologise for that and we have immediately cut  
 11 off supply and we are not supplying them any more"  
 12 So I take that as a signal that, in a sense, these  
 13 particular chipset manufacturers did appear, at least on  
 14 some occasions, to respect the restrictions that were in  
 15 those kinds of agreements.  
 16 Now, if that is true, if they do do that, then in  
 17 a sense it gives Qualcomm some degree of control over  
 18 more than its own sales of chipsets in the market and  
 19 then it is very hard to work out what that share is  
 20 because it is not very clear to me exactly when these  
 21 agreements applied and when they ceased to apply. The  
 22 MediaTek example is one. I think it is talked about  
 23 quite extensively in my report and also it is mentioned,  
 24 I think, in Qualcomm's skeleton.  
 25 MR TURNER: Dr Padilla, do you have any comment on that

187

1 exchange?  
 2 DR PADILLA: No, I would like to recall that the initial  
 3 question: are there exclusionary effects on the chipset  
 4 market for Qualcomm conduct? I think that there is no  
 5 evidence of exclusionary effect.  
 6 With respect to the line of questioning that was  
 7 followed now, I think that the thing that I would say is  
 8 that if I was a chipset — a competing chipset  
 9 manufacturer, I would be very scared if I was the one to  
 10 take the licences, because that would be used to put me  
 11 at a competitive disadvantage and if I was Qualcomm,  
 12 I would also be very scared because it may actually  
 13 expose me to exhaustion and I think that it is no  
 14 surprise that is why we end up with a level licensing.  
 15 MR RIDYARD: One question I just had, Mr Noble, when you  
 16 were talking there, I was wondering whether what you  
 17 were talking about there was removing the link between  
 18 the theory of harm and Qualcomm's market power as  
 19 chipset supplier, because if it is able to exert this  
 20 power over market, both through its own chipset supply  
 21 but also through its rival chipset makers way of  
 22 supplying, I mean, it still might be an unattractive  
 23 practice, but it is not any more related to market power  
 24 and chipsets per se, is it?  
 25 MR NOBLE: Well, I think if that was all — I think doing

188

1 that on its own, I think, it is not necessarily  
 2 problematic. I think that is why RTL is articulated as  
 3 a buttressing practice, because if what you do have is  
 4 you have a very large market share and you are, you  
 5 know, a very important counterparty for lots of OEMs,  
 6 then that gives you a lot of power and then you are  
 7 potentially increasing that power by adding on these  
 8 extra elements to it.  
 9 Ultimately it is a factual question about whether  
 10 they did in fact do that and the control that they  
 11 actually had over those chipset supplies, but I suspect  
 12 that will be a topic we will come back to tomorrow when  
 13 we talk about the leveraging analysis, because that  
 14 affects the measure of dependence.  
 15 MR RIDYARD: That may be a good time to break. Tomorrow we  
 16 will start with the notion of the non-infringing  
 17 counterfactual and a few questions on that topic.  
 18 THE CHAIR: All right. Thank you.  
 19 So we will call it a day then. We will come back  
 20 tomorrow at, if that is still all right with everyone,  
 21 9.30. Then we will aim to finish by tomorrow evening.  
 22 That means then the cross-examination of both Mr Noble  
 23 and Dr Padilla will be on Monday, 20th.  
 24 Mr Moser, you are rising. You want to make some  
 25 submissions on anything?

189

1 MR MOSER: Not particularly.  
 2 THE CHAIR: No, okay.  
 3 MR MOSER: I just thought I would rise out of politeness.  
 4 Housekeeping  
 5 MR SAUNDERS: Can I just mention one piece of housekeeping?  
 6 This is agreed, but it is a variation to an order that  
 7 the Tribunal made. We have agreed that the  
 8 cross-examination lists of documents for Dr Padilla and  
 9 Mr Noble can be exchanged tomorrow, rather than, I think  
 10 it was --- well, they were due today but they would have  
 11 in fact been due yesterday, now that everything has been  
 12 shuffled up. So just to mention that.  
 13 THE CHAIR: Okay.  
 14 Regarding the timetable after that, I detected some  
 15 consternation about the idea of filing submissions on ---  
 16 closing submissions next Friday. I anticipate that  
 17 you --- or at least those on one side of the room,  
 18 I detected the consternation. I anticipated that the  
 19 Class Representative might be wanting to stick with  
 20 Monday. Is that the case? I see nods behind you,  
 21 Mr Moser.  
 22 MR MOSER: I will defer to Mr Williams who has had that  
 23 discussion with our solicitors.  
 24 THE CHAIR: Mr Williams.  
 25 MR WILLIAMS: I think we would find it --- I think we would

190

1 prefer to do that, Madam, because, as you know, before  
 2 the submission comes in, there is a certain amount of  
 3 document finalisation to do and if the deadline is on  
 4 a Sunday lunchtime, then all of that will need to be  
 5 done ---  
 6 THE CHAIR: Oh, no, I was not thinking of Sunday lunchtime,  
 7 obviously. I had been --- no, when I said a day earlier,  
 8 I was thinking of close of business on Friday.  
 9 MR WILLIAMS: Well, that would really compress it by  
 10 several days, I think.  
 11 THE CHAIR: All right. What about, in that case, if we do  
 12 finish --- well, we will finish the evidence then on  
 13 Monday evening. On that basis, what about bringing the  
 14 timetable forward just to the start of the day on Monday  
 15 because then that gives us all a bit more time? It  
 16 gives you the weekend. Everyone will still have more  
 17 than what would have been under the original timetable  
 18 to prepare written closing submissions. If we said, for  
 19 example, 9 o'clock on Monday, 27th, is there any problem  
 20 with that?  
 21 MR WILLIAMS: I think that is preferable, Madam.  
 22 THE CHAIR: Right. So then, on that basis, we would stick  
 23 with the remainder of the timetable. That will just  
 24 build in a bit more time to read the closing submissions  
 25 and then we would --- then we maintain the Friday start

191

1 date for the oral closings. Yes, I think that is what  
 2 we thought.  
 3 Provisionally, on that basis, then filing written  
 4 closings by 9 o'clock on Monday, 27th.  
 5 We will see you all tomorrow morning at 9.30. Thank  
 6 you very much to both of you.  
 7 (4.47 pm)  
 8 (The court adjourned until 9.30 am  
 9 on Thursday, 15 October 2025)  
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 17  
 18  
 19  
 20  
 21  
 22  
 23  
 24  
 25

192

1 INDEX

2 Housekeeping .....1

MR ROBIN NOBLE (sworn) .....9

3 DR JORGE PADILLA (sworn) .....9

Questions by THE TRIBUNAL .....9

4 Housekeeping .....190

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

A						B
a19 (1) 108:8	adjournment (1) 94:16	49:18,22 79:13 92:8	anticompetitive (1) 166:22	argue (3) 45:15 103:24	125:21 126:7 128:7 144:13	151:23 153:21 155:17
abandon (1) 39:22	adjust (1) 64:6	96:18,21 98:2,7,19,22,24	anyone (5) 2:7 54:3 55:1	107:10	147:9 153:15 160:13,14	159:12 173:21 176:9
ability (21) 2:17 19:3,4 45:22	adjustments (2) 41:8,8	124:3 137:7 183:8	174:1 176:4	argued (1) 15:15	161:8 162:9 171:5	182:25 184:7 186:12
46:16 72:19 77:7 82:2,18	admit (1) 112:21	also (60) 2:22,24 3:8,19 4:7	anything (18) 6:17 12:20	arguing (2) 58:6 67:10	161:8 162:9 171:5	182:25 184:7 186:12
107:14 116:12	ado (2) 11:1 29:9	6:14 7:13 10:17 12:11	30:2 45:6 55:1 68:14	argument (18) 32:19 37:7	awful (1) 148:10	182:25 184:7 186:12
132:15,19,21 147:14	adopt (3) 27:4 62:1 64:20	13:5,17 14:20 19:12	69:8,21 77:18 81:2,3	44:17,22 45:17,21 51:1,6	awfully (1) 26:24	182:25 184:7 186:12
148:13 151:19 161:1 163:8	adopters (1) 64:18	21:7,8,12 22:15 23:12	102:14,16 156:8,11 174:9	52:13 68:22 74:12 79:17		182:25 184:7 186:12
172:17 183:1	advantage (12) 24:17 31:23	27:24 28:18 43:25 48:10	186:13 189:25	118:18 123:7 131:25,25		182:25 184:7 186:12
188:19	32:1 93:1 99:8,8,24 103:10	49:2 54:25 65:13 66:9	anyway (8) 10:18 23:4 119:6	147:17 150:15		182:25 184:7 186:12
above (6) 34:4 37:1 71:23	112:14 118:5,10 160:17	72:13,16 74:3 76:14	124:5 143:4 183:7 184:9	arguments (2) 24:3,5		182:25 184:7 186:12
107:14 113:15 150:17	advantages (1) 102:6	91:1,10 98:11,15 101:7,25	186:18	arise (1) 54:16		182:25 184:7 186:12
absence (3) 45:14 158:24,24	adverse (1) 14:7	104:5 105:3,7 108:16	anywhere (2) 32:24 152:5	arises (1) 31:17		182:25 184:7 186:12
absent (3) 35:5 84:13 116:9	advertising (3) 43:3 93:22,23	111:9 122:14,14 123:18	apart (2) 56:1 175:23	arising (3) 93:1 177:9 181:18		182:25 184:7 186:12
absolute (2) 151:8 154:21	advocate (2) 128:9,17	126:5 138:5 145:2 148:7	apologies (1) 110:21	arithmetical (2) 79:4,7		182:25 184:7 186:12
absolutely (2) 68:13 88:11	advocates (1) 78:7	151:11,21,22 153:6	apologise (1) 187:10	arose (1) 173:20		182:25 184:7 186:12
abuse (10) 71:9 73:2 116:3	affairs (2) 180:9,18	159:17,18 179:1,22 182:16	appear (6) 30:12 63:12 77:7	arousal (10) 21:3,5,11 81:9		182:25 184:7 186:12
117:22,24 174:4 175:2	affect (2) 2:17 9:24	187:23 188:12,21	105:3 175:21 187:13	85:15 121:23 147:23		182:25 184:7 186:12
177:6,17,22	affected (2) 158:20,20	alter (1) 72:20	appeared (1) 69:23	151:12 169:6 179:2		182:25 184:7 186:12
177:6,17,22	affects (3) 90:17,20 189:14	alternate (1) 10:8	appears (10) 30:3 61:24	arrangements (1) 65:8		182:25 184:7 186:12
177:6,17,22	afraid (1) 16:4	alternative (7) 41:4 125:19	111:8 129:10 139:1 140:5	arrive (3) 17:22 76:17 112:15		182:25 184:7 186:12
177:6,17,22	after (11) 1:25 49:11 71:7	131:10 145:18 146:3	156:22 171:7 183:12,13	art (1) 158:3		182:25 184:7 186:12
177:6,17,22	again (30) 27:3,6 39:1	162:10 184:15	apple (189) 1:20 4:11	articulated (2) 36:19 189:2		182:25 184:7 186:12
177:6,17,22	41:14,16 53:24 61:3 63:23	alternatives (18) 124:24	5:10,19 7:6 8:6 11:7	artificial (1) 31:16		182:25 184:7 186:12
177:6,17,22	64:15 77:10 92:9 101:4	125:6 129:2,3,17 132:5	12:10,13,17,19	ascendancy (1) 112:9		182:25 184:7 186:12
177:6,17,22	112:17,21 139:24 144:1	144:9 145:10 146:1	13:18,19,22,24 14:8,15,16	ask (13) 19:18 25:4 42:22		182:25 184:7 186:12
177:6,17,22	147:19 148:8,16 149:20	149:14,17 158:24,25,25	15:3 16:2,9,16 17:6	50:19 55:11 87:14 94:19		182:25 184:7 186:12
177:6,17,22	150:5 161:23 162:11	169:1,1,4 174:25	19:2,3,9,20,21,23 20:13	124:5 126:10 143:19 158:1		182:25 184:7 186:12
177:6,17,22	163:22 165:6,7 169:16	88:13 105:4 151:25	21:6 22:4 23:17,18	173:5,8		182:25 184:7 186:12
177:6,17,22	172:20 174:7 184:20	always (11) 4:12 25:25 41:20	24:15,19 25:10 26:2,3,23	asked (5) 57:15 68:7 85:23		182:25 184:7 186:12
177:6,17,22	against (8) 14:7 28:12 32:19	77:20 82:24 84:19 88:20	27:19,20,20,21 35:4,6	172:23 173:13		182:25 184:7 186:12
177:6,17,22	58:4 74:14 116:11 153:4	99:17,24 129:21 156:5	37:3,7,9,9,12,24 38:2	asking (5) 79:2 147:16 158:7		182:25 184:7 186:12
177:6,17,22	186:25	america (1) 51:17	42:15,19 43:25 44:15,16	159:6,6		182:25 184:7 186:12
177:6,17,22	agents (1) 181:9	among (1) 108:6	46:1,2,5,12,12,16,19,21	assist (5) 55:8 93:15 131:18		182:25 184:7 186:12
177:6,17,22	aggregate (5) 11:16 23:23	amongst (2) 47:20 92:1	48:11,12 51:11 52:16	183:10 186:9		182:25 184:7 186:12
177:6,17,22	28:5 82:14 88:4	amortise (2) 46:17 99:16	53:4,11 57:6	aspects (3) 64:6 183:9 184:7		182:25 184:7 186:12
177:6,17,22	aggregated (1) 150:12	amortised (2) 33:23 46:11	59:12,19,20,21	assess (3) 12:4 16:7 142:18		182:25 184:7 186:12
177:6,17,22	aggregates (1) 24:2	amount (11) 31:17 36:25	60:1,16,21,23	assessment (6) 14:4 18:5,10		182:25 184:7 186:12
177:6,17,22	agitated (1) 14:11	41:13 96:6,9 134:10,12	61:5,12,13,23 62:7,13 63:4	19:17 142:16,17		182:25 184:7 186:12
177:6,17,22	agnostic (1) 75:10	161:17 168:23,24 191:2	64:23,25 65:5,7,13	assessments (1) 137:8		182:25 184:7 186:12
177:6,17,22	agree (27) 12:25 13:1,5	137:18 177:21 180:11	66:3,7,13,13 67:1,4,4,12	assets (2) 103:22 108:10		182:25 184:7 186:12
177:6,17,22	18:4,10,17 20:23 24:7	analogy (1) 41:19	74:8 75:22 76:3,7,8 79:25	assist (1) 10:19		182:25 184:7 186:12
177:6,17,22	51:12 56:12 58:5 72:12	analogy (3) 34:21 41:19,21	80:3,20 81:8,10 83:7,17,21	assistance (2) 10:19 67:23		182:25 184:7 186:12
177:6,17,22	77:5 82:18 91:9 94:5,6	analyses (7) 51:21,22 70:8,14	84:10,13,15 85:1,15	assists (1) 60:9		182:25 184:7 186:12
177:6,17,22	109:2,25 124:22 127:24	137:18 177:21 180:11	87:11,16,25,25	associated (2) 65:12 105:6		182:25 184:7 186:12
177:6,17,22	130:23 137:19 153:2	analysed (1) 18:12	88:14,18,20 102:1,4,11	associates (1) 105:11		182:25 184:7 186:12
177:6,17,22	137:18 161:21 168:16	analysing (1) 185:14	105:22 106:1 108:7,8,14	assume (6) 13:4 47:9 63:16		182:25 184:7 186:12
177:6,17,22	agreed (5) 58:7 73:13 77:14	analysis (40) 13:7,8,18	111:5 120:7 124:15	154:12 169:13 181:20		182:25 184:7 186:12
177:6,17,22	190:6,7	17:2,3,5,6,8 37:4 39:4	125:1,6,9 126:4,20	assumes (1) 147:9		182:25 184:7 186:12
177:6,17,22	agreeing (1) 93:8	50:20 52:8 53:8 55:14 61:6	128:1,15 129:6,8 131:4	assuming (8) 35:17 91:5		182:25 184:7 186:12
177:6,17,22	agreement (20) 3:7,11 4:17	68:8,9,16,21,22 69:2,18	134:4,8,18 138:9,17	115:15,17 141:25 144:22		182:25 184:7 186:12
177:6,17,22	8:14 48:21,25 50:7 61:12	71:4 73:21 87:9 127:22	140:6,10 142:9,24	162:5 169:12		182:25 184:7 186:12
177:6,17,22	70:21 72:10 99:11 125:17	128:18 134:19 137:19	143:21,22,23 144:2,3,8,24	assumption (1) 121:14		182:25 184:7 186:12
177:6,17,22	126:19 134:4,14	145:12 146:10,13,22,24	147:1 150:4,25,25 151:12	assumptions (3) 87:4 90:17		182:25 184:7 186:12
177:6,17,22	137:13,17,20 139:5 146:9	152:19 153:13 154:11	152:19 153:13 154:11	131:11		182:25 184:7 186:12
177:6,17,22	agreements (16) 2:6,13,21	156:12 158:18 162:4	156:12 158:18 162:4	assured (6) 140:12,16 160:12		182:25 184:7 186:12
177:6,17,22	8:10 14:18 16:1,1,3,14	169:8,12 170:18 171:20	169:8,12 170:18 171:20	170:24 171:3,14		182:25 184:7 186:12
177:6,17,22	104:21 127:20 139:18,18	172:13 176:22 185:2,3,6	172:13 176:22 185:2,3,6	asyet (2) 109:18 116:23		182:25 184:7 186:12
177:6,17,22	179:2 187:15,21	155:20,21 162:11,12	155:20,21 162:11,12	asymmetric (1) 99:8		182:25 184:7 186:12
177:6,17,22	ahead (1) 72:24	177:11 181:22 186:16	177:11 181:22 186:16	asymmetry (11) 92:11		182:25 184:7 186:12
177:6,17,22	aim (1) 189:21	189:13	189:13	93:6,22 96:17,20 97:3,4		182:25 184:7 186:12
177:6,17,22	air (1) 3:3	analytical (1) 73:9	analytical (1) 73:9	101:15,15 103:25 178:4		182:25 184:7 186:12
177:6,17,22	aired (1) 123:25	ancillary (1) 179:1	ancillary (1) 179:1	atomised (3) 26:16 97:7		182:25 184:7 186:12
177:6,17,22	aligned (1) 23:7	andrew (1) 179:8	andrew (1) 179:8	119:9		182:25 184:7 186:12
177:6,17,22	alive (1) 100:25	android (8) 34:22,23,23	android (8) 34:22,23,23	att (3) 49:15,21 50:23		182:25 184:7 186:12
177:6,17,22	allicomers (1) 182:23	35:1,3 67:6,11 68:2	35:1,3 67:6,11 68:2	attempt (2) 119:3 175:15		182:25 184:7 186:12
177:6,17,22	allegations (1) 73:2	androids (1) 67:7	androids (1) 67:7	attempts (1) 107:25		182:25 184:7 186:12
177:6,17,22	alleged (5) 16:19 71:9	anew (1) 143:14	anew (1) 143:14	attention (3) 56:17 147:18		182:25 184:7 186:12
177:6,17,22	121:15 155:17 174:4	annoy (1) 107:18	annoy (1) 107:18	150:1		182:25 184:7 186:12
177:6,17,22	alleging (2) 56:18 168:2	another (14) 23:11 38:10	another (14) 23:11 38:10	attenuated (1) 122:22		182:25 184:7 186:12
177:6,17,22	allocate (1) 43:6	49:25 52:12 55:19 59:13	49:25 52:12 55:19 59:13	attestation (1) 9:20		182:25 184:7 186:12
177:6,17,22	allow (4) 12:23 35:8 113:14	63:7 74:17 98:10 103:2	63:7 74:17 98:10 103:2	attractive (4) 38:22 39:7		182:25 184:7 186:12
177:6,17,22	154:8	136:19 162:20 176:11	136:19 162:20 176:11	49:14 133:5		182:25 184:7 186:12
177:6,17,22	allowed (1) 155:17	184:4	184:4	attractiveness (1) 40:5		182:25 184:7 186:12
177:6,17,22	allows (2) 118:6 120:19	answer (20) 2:2,14 21:17	answer (20) 2:2,14 21:17	author (1) 161:24		182:25 184:7 186:12
177:6,17,22	alluded (4) 13:9 47:22	23:4,22 29:8 36:16 39:19	23:4,22 29:8 36:16 39:19	authorities (1) 154:2		182:25 184:7 186:12
177:6,17,22	117:12 130:8	89:8 116:8 129:25	89:8 116:8 129:25	automatically (1) 123:6		182:25 184:7 186:12
177:6,17,22	alluding (1) 144:16	130:4,18 142:1,2 152:18	130:4,18 142:1,2 152:18	availability (2) 128:3 169:3		182:25 184:7 186:12
177:6,17,22	almost (15) 10:17 18:3 26:13	155:21 161:20 174:13	155:21 161:20 174:13	available (10) 31:24 41:11		182:25 184:7 186:12
177:6,17,22	34:16 64:15 97:9 105:14	answered (1) 35:10	answered (1) 35:10	129:2,3,14 136:8 145:22		182:25 184:7 186:12
177:6,17,22	112:10 130:19 132:8 144:1	answers (3) 10:21 75:12 79:2	answers (3) 10:21 75:12 79:2	146:21 161:11 162:12		182:25 184:7 186:12
177:6,17,22	160:18 181:8 185:22 187:1	ante (2) 97:3,4	ante (2) 97:3,4	average (2) 70:18 92:17		182:25 184:7 186:12
177:6,17,22	along (2) 45:24 187:5	anticipate (3) 39:11 121:10	anticipate (3) 39:11 121:10	averred (1) 5:10		182:25 184:7

83:21,24,25 108:22 145:3  
**bound (1)** 35:2  
**boundaries (1)** 11:19  
**box (2)** 2:9 33:16  
**brand (9)** 60:23 61:23 93:25  
 94:1 97:16,19  
 151:21,22,24  
**breach (4)** 139:16 140:15,25  
 141:21  
**breached (1)** 187:8  
**breaching (2)** 140:14 183:24  
**break (7)** 53:22 55:5  
 136:2,10 143:15,17 189:15  
**bricks (1)** 21:1  
**brief (1)** 102:21  
**briefly (3)** 1:5 89:15 178:20  
**bring (6)** 26:1.3 65:6 136:6  
 137:1 158:18  
**bringing (2)** 136:15 191:13  
**brings (2)** 64:25 65:2  
**broad (1)** 19:7  
**broadcom (2)** 95:15 104:13  
**broader (2)** 28:19 138:6  
**broadest (1)** 29:13  
**broadly (4)** 31:17 44:10 76:9  
 146:9  
**brought (1)** 111:6  
**browser (1)** 165:18  
**browsers (1)** 164:22  
**brutal (1)** 168:24  
**budget (4)** 43:20,20,24 44:1  
**build (6)** 97:16 98:22 100:21  
 101:9 136:25 191:24  
**builds (2)** 20:24 21:3  
**built (2)** 98:7,23  
**burst (1)** 137:16  
**business (20)** 64:24 92:7  
 104:18 106:2,4,10 108:18  
 124:18 150:9 151:13  
 156:10,14,16 158:13,19  
 160:7 161:20 167:2 177:25  
 191:8  
**butts (11)**  
 180:5,13,17,20,21 181:7  
 182:7,20,21,25 183:8  
**butts (1)** 182:17  
**butts (2)** 177:17 189:3  
**buy (21)** 23:10 24:12 42:8  
 47:7 58:10,18,19,20  
 63:19 98:17 133:16,19  
 134:10 145:2,4,7  
 160:19,20 181:12 185:3  
**buyer (15)** 19:15 80:3 109:17  
 121:8 124:1,7,8,11,14  
 125:12,15,24 156:12  
 157:14,15  
**buyers (8)** 88:8 97:7 109:12  
 121:3,3 125:18 131:21  
 132:5  
**buyin (1)** 48:22  
**buying (15)** 24:12 37:9  
 104:17 108:9 143:25  
 145:4,14,18,21 146:1  
 156:5 170:8,23 185:2,8  
**buyout (2)** 103:21 108:6  
**buys (9)** 19:23 23:18  
 42:15,16 106:1 110:25  
 144:2,24 145:12  
**bypass (4)** 182:20 184:9  
 186:18,21

C

**calculate (1)** 90:12  
**calculated (1)** 85:7  
**calculating (1)** 90:3  
**calculation (2)** 88:10 153:25  
**california (1)** 8:11  
**call (5)** 9:3 27:15 65:23  
 171:16 189:19  
**called (3)** 20:4 30:25 116:11  
**calling (2)** 8:3 83:4  
**calls (2)** 30:13 178:25  
**came (2)** 5:14 85:23  
**candidate (4)** 11:15,16,18,21  
**cannot (26)** 29:5 35:10 48:4  
 49:7 52:3 76:23 100:20

105:15 107:9 114:21,21  
 115:19 116:14 118:16  
 124:24 131:2 152:2 160:13  
 161:8 162:3 172:15 176:25  
 181:13 182:20 183:2 184:8  
**canvas (1)** 135:20  
**capabilities (1)** 108:13  
**capability (2)** 111:6 128:12  
**capable (3)** 3:2,5 54:19  
**capacity (11)** 80:12,17,18  
 81:4,10,11,25 82:25 129:4  
 148:9,17  
**capital (1)** 111:8  
**capture (1)** 2:15  
**captures (1)** 91:13  
**capturing (2)** 86:21 91:8  
**care (2)** 86:20 185:24  
**careful (2)** 154:24 157:12  
**carefully (2)** 32:18 146:3  
**carries (5)** 27:21 37:8,8  
 45:17 94:2  
**carrot (1)** 161:2  
**carry (2)** 40:21 49:1  
**cases (3)** 10:20 66:24 82:10  
**casespecific (1)** 13:8  
**cash (1)** 115:1  
**catch (1)** 107:3  
**categorically (1)** 27:8  
**category (2)** 71:14,23  
**cause (1)** 133:11  
**caused (1)** 40:11  
**causes (1)** 79:18  
**cautious (1)** 77:25  
**caveat (1)** 88:13  
**cde (2)** 15:20 19:6  
**cdma (109)** 2:5  
 3:3,4,6,9,19,25 4:13,14  
 5:18 25:2  
 28:13,15,15,16,19  
 29:4,7,12  
 30:4,6,8,13,13,19,25 31:11  
 34:6 35:18 36:3,7,25  
 37:10,11,13,15,20 38:1,7  
 39:6,10,13,20 40:14,15,15  
 41:3,5,12 42:15,16,17  
 43:5,5,12,14 44:9,25  
 46:3,6,13,14,16,16,22  
 47:1,4,4,15,24 48:11  
 49:2,6,18 50:5,5,12,22,24  
 51:2,10 53:11,18 57:17  
 68:10 87:1,5 90:12  
 91:4,4,12 98:21 103:15  
 104:18 112:6,11,12,16  
 149:2,17 150:4,10,23  
 151:11 152:7,16,24 153:4  
 154:12  
**cdma2000 (1)** 3:20  
**cdmas (1)** 34:10  
**cdmaunts (1)** 44:16  
**cease (1)** 184:7  
**ceased (1)** 187:21  
**ceasing (1)** 153:16  
**cellophane (3)** 31:9 32:3  
 35:13  
**cellular (5)** 95:9,10,11,21  
 175:20  
**cent (1)** 88:21  
**certain (8)** 2:23 33:14 39:13  
 97:15 101:9 104:7 124:22  
 191:2  
**cfo (1)** 53:15  
**chain (1)** 72:7  
**chair (74)** 1:4,8,11 2:19 3:22  
 4:6,14,21,25 5:6,12,19,24  
 6:11,16 7:10,18,24  
 8:4,7,19,24  
 9:2,4,6,13,16,19 25:3  
 26:6,9,20 27:8,16 28:6  
 53:22 54:19 64:23 66:23  
 81:12 86:1 94:11 115:21  
 117:2,13,14 120:17  
 121:5,12,16,19 123:15,21  
 135:10 136:10,20 142:21  
 143:15 152:4,15 155:19  
 165:19 167:16 173:16,23  
 174:1 179:7 189:18

190:2,13,24 191:6,11,22  
**challenge (13)** 122:8 123:3  
 133:1,7 140:3 171:2,7  
 181:23,25 184:13,23  
 186:3,20  
**challenged (1)** 141:5  
**challenges (1)** 82:22  
**challenging (2)** 97:15 140:22  
**chance (2)** 78:7 114:25  
**change (5)** 6:15 42:19 47:7  
 66:11 70:2  
**changed (1)** 142:7  
**changeover (1)** 60:1  
**changes (3)** 26:4 69:20 104:5  
**changing (4)** 42:24 66:25  
 67:1 133:2  
**characterisation (3)** 76:21  
 77:13 178:12  
**characterise (3)** 26:18  
 137:15 159:12  
**characterised (1)** 118:21  
**characteristic (3)** 80:6,8  
 81:22  
**characteristics (1)** 115:17  
**charge (16)** 29:7 30:13  
 184:1  
**charged (2)** 91:4 118:9  
**charges (2)** 33:7 119:16  
**charging (5)** 31:10 36:8  
 114:7 115:2 120:22  
**chart (3)** 70:17 148:25  
 157:24  
**charts (1)** 157:23  
**check (6)** 5:25 67:3 111:18  
 136:12 137:2 142:18  
**checked (2)** 2:9 139:24  
**child (1)** 24:21  
**china (5)** 28:23 43:9,18  
 52:22,25  
**chip (14)** 3:24 10:13 19:19  
 21:8 74:8,9  
 112:11,11,11,12 180:8  
 181:17,25 184:12  
**chips (21)** 2:17,17 7:7 72:2  
 74:9 81:12 108:19 129:8  
 133:16,19 169:8,13 170:9  
 171:14 181:20  
 184:2,2,14,19 185:2,3  
**chipset (131)** 3:14 14:16  
 16:19 17:11 19:1,2,5,8,10  
 20:10,11 21:3,12 23:19  
 28:1 30:4,20 32:5,9  
 33:11,17,17,18,19  
 34:7,7,16,16 35:17 36:5  
 37:11,24,25 49:12 50:6  
 53:12 55:13,21,22 56:14  
 57:10 58:10 60:8 64:5  
 66:11 71:6 73:18  
 75:13,24,24 80:19 83:2,19  
 90:23 91:17 94:25  
 106:2,4,5 108:8 109:12  
 113:15,23 114:13,22 115:6  
 116:6,17,23  
 117:3,4,4,6,16,21 118:12  
 119:13 120:10 121:6 122:1  
 124:18 125:15 141:1  
 146:12,13,23 147:19  
 148:11 150:17,20  
 169:20,23 173:1,4,7,9  
 177:9,20,25 178:18,23  
 179:15 180:24 181:5,8  
 182:24 183:1,2,3,4,14,22  
 184:8,22 185:8,22,25  
 186:6,7,19,25 187:4,6,13  
 188:3,8,8,19,20,21 189:11  
**chips (109)** 2:8,10 3:15  
 11:5,7 12:11 15:17  
 19:20,24 20:1 23:9,11,12  
 24:16 25:2 28:11 29:5,7,8  
 30:6,22 32:22,23 33:24  
 35:19 37:9,10 39:10,10  
 40:15 46:10 47:10 51:3  
 52:19 53:11 55:10 57:22  
 63:8 69:16

71:11,14,14,17,22 74:16  
 77:8 83:5,22 87:1 90:14  
 98:18,23 99:18 105:16  
 114:8,17 115:3 118:24  
 119:12 120:5,14 123:9  
 124:16 126:23 127:25,25  
 131:7,24 132:3 133:22  
 134:11 140:4,17 143:12  
 146:19 147:15 149:1  
 150:24 152:16 153:16  
 154:5 158:17,19 162:4  
 166:2 169:21,25  
 170:23,24,25 171:9 172:1  
 175:24 178:1 179:11  
 181:1,6,6,12 183:15,16,18  
 185:8 186:2,5,6 187:9,18  
 188:24  
**choice (10)** 51:4,5 57:24,25  
 58:9,10 76:5 125:19  
 133:14,16  
**choices (3)** 58:13 59:7 157:8  
**chose (4)** 37:16 101:8  
 114:6 115:1  
**chooses (1)** 114:6  
**choosing (3)** 21:15 84:23  
 114:16  
**chose (1)** 143:6  
**chosen (2)** 87:25 156:21  
**christopher (1)** 43:22  
**chrome (2)** 165:7,10  
**chunk (4)** 88:9 96:13 124:19  
 156:5  
**circle (1)** 94:8  
**circular (2)** 73:18,20  
**circumstances (1)** 142:8  
**cite (1)** 93:10  
**cited (1)** 48:7  
**claims (1)** 28:12  
**clarification (4)** 6:16 78:8  
 172:20 173:17  
**clarify (8)** 18:18 28:14,22  
 56:13 75:11 93:16 173:5  
 177:7  
**clarity (2)** 78:11 90:24  
**class (14)** 6:4 13:10 32:19,21  
 85:6,22 114:11 148:21  
 149:6 168:11 172:2 177:15  
 178:24 190:19  
**classes (1)** 130:8  
**classic (1)** 31:7  
**classically (1)** 27:14  
**clauses (2)** 122:11 179:3  
**clear (20)** 19:13 23:21 24:24  
 28:14 49:4 90:14,16 91:1  
 104:13 107:22 114:5 129:5  
 135:19 138:16 143:24  
 150:3 158:8 162:8 169:5  
 187:20  
**clearly (10)** 10:10 22:12  
 28:11 71:9 79:10 84:9  
 100:18 113:9 130:1 138:21  
**clients (3)** 29:2 102:8 165:23  
**close (3)** 33:6 93:17 191:8  
**closely (3)** 21:10 69:13 105:6  
**closeness (1)** 56:7  
**closing (5)** 8:15 136:25  
 190:16 191:18,24  
**closings (2)** 192:1,4  
**clothes (3)** 41:22,24 43:16  
**cm (2)** 1:21,23  
**cm (7)** 34:24 62:10 67:23  
 68:1 69:8,10 92:25  
**cms (4)** 5:11,20 15:4,2  
 171:12  
**code (1)** 28:16  
**coexisted (2)** 44:25 45:1  
**coexistence (1)** 12:7  
**coherent (6)** 32:19 48:13  
 114:19,23 116:8 168:5  
**coin (1)** 97:10  
**colleague (3)** 66:14 83:9  
 134:25  
**colleagues (1)** 10:13  
**colour (1)** 42:7  
**colours (2)** 41:25 42:6  
**column (1)** 86:13

**columns (3)** 87:1 90:19,21  
**come (26)** 9:22 12:24 14:24  
 18:1 25:5 36:13 62:10 71:7  
 73:24 75:11 103:18,20  
 104:2,11,15 124:11  
 136:3,21 148:18 177:1,2  
 181:4 182:8 186:19  
 189:12,19  
**comeback (1)** 76:13  
**comes (15)** 17:18,20 18:13  
 39:23 41:21 45:24 63:23  
 64:15 74:18 76:14 107:20  
 123:6 132:23 170:6 191:2  
**comfortable (7)** 32:12  
 119:15 144:13 160:4  
 167:22 170:19,25  
**coming (7)** 10:23 24:24  
 26:17 36:14 44:6 135:16  
 168:24  
**commas (1)** 90:12  
**comment (14)** 14:5 22:17  
 107:2 123:17 127:13  
 130:22 151:6 159:4 162:24  
 167:17 170:5 172:5 174:12  
 187:25  
**commented (1)** 114:2  
**comments (8)** 15:10 20:21  
 23:6 38:4 50:2 55:23 104:6  
 176:13  
**commercial (1)** 178:22  
**commercially (1)** 63:14  
**commission (2)** 48:9 77:22  
**commissions (1)** 33:22  
**commitment (6)** 134:13,13  
 156:18 183:19,21 187:8  
**commitments (3)** 36:9  
 171:12 183:13  
**common (7)** 6:10,12 11:23  
 20:16 83:4 153:11 164:21  
**companies (4)** 81:6 132:10  
 164:7 166:5  
**company (8)** 33:24 88:19  
 101:18 154:17 164:5  
 165:22,22 166:18  
**comparable (3)** 44:10 45:2  
 68:3  
**compare (3)** 152:16 155:7,16  
**compared (4)** 11:12 29:7  
 67:5 156:12  
**compares (1)** 152:7  
**comparison (4)** 52:14 68:11  
 87:9 152:19  
**compatible (6)** 3:25 4:8,12  
 5:21 30:7 48:19  
**compel (1)** 61:15  
**compensate (3)** 64:7 76:2  
 102:5  
**compete (10)** 20:16 25:9  
 26:4 115:19  
 163:11,11,12,12 165:25  
 166:1  
**competes (1)** 67:7  
**competing (9)** 38:8 57:6,6  
 62:6 149:1 165:1  
 167:13,13 188:8  
**competition (20)** 25:6,8  
 27:22 34:25 35:5 42:2,18  
 67:13 79:24 157:20,21  
 165:25 167:20 168:3  
 174:7,20,22 175:3,8 178:5  
**competitive (29)** 24:10,17  
 25:22 31:16  
 35:5,14,16,18,22 37:1  
 71:24 76:1 84:3 107:14  
 108:14 113:16 118:8  
 120:15,21 124:9,10 150:18  
 165:11 175:14  
 176:8,12,14,23 188:11  
**competitor (1)** 115:13  
**competitors (4)** 25:21 163:9  
 165:9,23  
**complement (2)** 38:11,18  
**complements (2)** 38:10,18  
**complete (3)** 51:2 82:24  
 142:1  
**completed (1)** 54:7

**completely (9)** 26:16 48:3  
 85:3 100:20 131:8 145:1  
 170:4 171:24 180:1  
**complexity (2)** 106:7 115:9  
**complicated (8)** 33:16 34:15  
 41:20 71:11 90:3 117:7  
 129:23 184:4  
**component (1)** 20:11  
**components (2)** 20:10  
 175:19  
**composition (1)** 47:4  
**compress (1)** 191:9  
**compromise (2)** 144:15  
 152:25  
**computers (1)** 53:6  
**conceive (3)** 49:5 64:16  
 112:12  
**concentration (1)** 101:25  
**concept (5)** 25:4 68:11 158:4  
 159:8 174:11  
**concepts (1)** 44:6  
**conceptual (4)** 24:4 116:21  
 124:5 125:24  
**conceptualise (1)** 27:9  
**conceptualising (1)** 58:8  
**conceptually (3)** 64:13  
 141:25 170:17  
**concern (1)** 12:19  
**concerned (3)** 79:3 106:16  
 129:7  
**concerns (2)** 12:9 15:13  
**conclude (1)** 35:8  
**concluded (1)** 34:24  
**conclusion (3)** 72:22 74:15  
 79:19  
**conclusions (1)** 9:25  
**concrete (1)** 92:4  
**condition (1)** 57:23  
**conditions (2)** 28:2 172:17  
**conduct (9)** 16:8 22:2 61:12  
 174:4 177:9,12 182:10,12  
 188:4  
**conducted (1)** 162:13  
**confess (1)** 69:14  
**confident (1)** 157:17  
**confidential (8)** 54:22,23,25  
 95:16 135:6 179:6,19  
 187:4  
**confidentiality (1)** 54:15  
**confirmed (1)** 7:13  
**conflating (1)** 165:19  
**confused (4)** 172:6,6,8,9  
**connection (2)** 52:17 146:16  
**connectivity (1)** 29:17  
**cons (2)** 68:15,17  
**consequence (1)** 55:1  
**consequences (2)** 18:23  
 113:8  
**consider (14)** 22:15,20,20  
 41:23 83:17 94:23 102:23  
 107:11,11 132:3 143:11  
 146:10 155:15 178:16  
**consideration (1)** 53:8  
**considerations (1)** 53:15  
**considered (2)** 56:10 129:17  
**considering (5)** 21:25 29:1  
 60:11 96:23 97:6  
**considers (1)** 69:10  
**consistency (2)** 16:22 134:19  
**consistent (17)** 30:24  
 45:8,10 55:15 60:22 61:25  
 63:15 91:12 103:8 104:25  
 144:25 145:2,16 160:11  
 179:13,21,22  
**consistently (1)** 163:1  
**constant (1)** 141:14  
**constantly (1)** 67:15  
**constriction (2)** 190:15,18  
**constrain (1)** 72:6  
**constrained (7)** 43:12 80:19  
 116:1,4,7,24 117:8  
**constraint (8)** 19:9 35:5 44:1  
 57:25 84:3 108:15 109:4  
 121:12  
**constraints (8)** 24:11 25:22  
 43:20,21,24 58:16 81:25

91:17  
**construction (3)** 5:16  
 8:15,20  
**consumer (11)** 40:12 50:14  
 51:24 58:13 59:2 61:21,22  
 62:22 63:24,25 174:21  
**consumers (7)** 38:22 41:16  
 42:3 62:18 63:25 87:22  
 163:9  
**contained (1)** 179:3  
**contemplated (2)** 137:25  
 138:24  
**contemporaneous (1)** 130:9  
**contention (1)** 36:22  
**contents (1)** 9:21  
**contest (1)** 118:16  
**contestable (2)** 118:12,14  
**context (20)** 14:21 18:19  
 28:17 30:17 41:9  
 58:12,13,15 82:9 93:14  
 95:8 125:13 138:6 144:5,9  
 158:15 168:10 174:17,17  
 177:20  
**continue (4)** 94:18 140:19  
 141:6 167:1  
**continues (1)** 140:2  
**continuous (4)** 50:11 101:2  
 137:21 167:3  
**continuously (4)** 47:6 165:2  
 168:18,25  
**continuum (1)** 26:15  
**contour (1)** 74:3  
**contract (15)** 109:1,2  
 140:7,14,15 141:16,20  
 142:5,13,14 1

counterfactual (7)  
123:12,13,15,18,20,21  
189:17  
counterparty (4) 24:19 46:9  
175:10 189:5  
counterstick (1) 161:11  
countervailing (4) 19:14  
116:11 125:12 126:12  
countries (2) 44:24 50:22  
couple (6) 66:2 73:23 88:8  
102:21 149:22 162:18  
course (26) 6:7,21,21 8:2,9  
10:14 14:25 15:7 36:14  
56:14 61:11 69:4 85:7  
96:4,6 97:21,22 100:5  
112:14 125:1 130:12 138:6  
140:14 147:10 153:6 157:8  
courts (1) 181:3  
cover (2) 33:14 96:2  
covered (7) 3:21 4:3,18 5:20  
50:18 124:3 125:14  
covering (1) 33:25  
covers (2) 71:3 137:5  
cpo (1) 41:7  
cr (4) 36:1 151:4 162:13  
168:2  
crashing (1) 181:4  
create (11) 32:8,9 93:6,25  
121:24 122:4 152:24 168:7  
177:19 179:14 180:3  
created (5) 93:24 97:13  
115:8,11 180:22  
creating (2) 178:5,22  
creativity (1) 111:6  
credibilities (1) 130:3  
credibility (9) 128:8,10  
129:19,20 132:17 149:15  
154:20,20 169:3  
credible (18) 98:10 100:15  
104:19 105:25 124:23,23  
125:19 128:15 130:16,21  
144:8 145:9,17 154:5,6  
157:4,5 170:3  
credibly (4) 74:8,12 125:20  
128:7  
critical (6) 18:20 34:4 92:22  
93:5 127:9 182:16  
cross (1) 173:19  
crosscontamination (1)  
15:24  
crossexamination (7) 5:14  
6:22 7:4 9:5 54:10 189:22  
190:8  
crossing (1) 161:14  
crosslicensing (1) 126:3  
crosslicensing (1) 127:24  
crs (1) 153:20  
cruciality (1) 152:23  
crux (1) 175:17  
cumulative (1) 109:6  
current (2) 47:21 169:7  
currently (2) 136:23 170:22  
customer (8) 40:4 42:24  
48:3 75:14 106:9 151:24  
173:4,21  
customers (12) 39:14 47:20  
49:7 52:6 61:15 63:1 83:16  
97:16 107:19 119:9 128:6  
165:23  
customisation (1) 20:2  
customised (1) 19:23  
cut (5) 46:14 181:11  
185:4,25 187:10  
cutthroat (1) 157:20  
cutting (1) 150:23  
cycle (1) 171:22

---

D

damage (2) 12:13 153:7  
damages (2) 13:24 14:12  
danger (1) 176:23  
dangerous (1) 41:20  
data (8) 30:18 48:6 52:4  
55:24 62:2 86:25 89:21  
157:9  
dataset (1) 90:25

datasets (2) 90:13,16  
date (2) 2:15 192:1  
dates (4) 138:11 142:25  
143:2 148:24  
day (14) 22:10 26:18 61:14  
83:7 107:15 135:23  
136:5,7,16,22 173:11  
189:19 191:7,14  
day5138139 (1) 1:15  
daybyday (1) 139:20  
days (3) 75:13 136:25 191:10  
de (1) 164:11  
deadline (2) 136:17 191:3  
deal (7) 6:14 8:18 10:16  
52:19 72:25 133:18 161:7  
dealing (1) 159:8  
deals (2) 17:1 108:13  
dealt (2) 54:20 132:16  
debate (10) 6:15 12:17 41:6  
104:16 105:8 116:21  
126:15 127:9 148:20 168:4  
debated (1) 67:15  
debates (1) 8:15  
debating (1) 109:15  
decide (8) 16:5 21:20 43:6  
118:19,22 132:18 139:15  
181:16  
decided (8) 31:11,12 48:11  
66:7 80:20,21 140:6,25  
decides (5) 32:15 75:18 76:8  
79:25 84:15  
deciding (6) 51:15 52:24  
58:24 61:20,22 145:2  
decision (8) 33:22 43:13  
46:19 47:9 80:4 88:7  
130:20 146:10  
decisions (10) 53:3,4 81:24  
82:3 84:10,14 85:1 87:22  
88:4 125:9  
declared (1) 115:14  
decline (1) 33:18  
declines (3) 100:1,2 166:3  
declining (1) 33:24  
defeat (1) 40:16  
defeated (1) 41:2  
defend (2) 46:5 86:18  
defended (1) 164:23  
defending (1) 164:18  
defer (1) 190:22  
define (4) 2:23 11:18 25:23  
125:16  
defined (5) 3:1 19:6 85:18  
86:8,9  
defining (4) 11:21 67:10  
73:11 76:9  
definition (27) 5:4 11:2 12:5  
13:7,8 14:2 18:6,8,15,20  
21:16,21 22:16 25:13,15  
28:3 30:18 55:9 65:3 72:23  
73:7 77:23 78:6 93:3  
145:20 148:20 160:2  
definitions (3) 78:21 93:9  
159:10  
definitive (1) 56:9  
degree (9) 31:2 49:22 62:23  
159:25 160:15 161:5,9  
179:14 187:17  
delay (1) 108:19  
deliberately (1) 114:16  
delivery (1) 167:8  
delta (5) 30:23 40:9 41:15  
64:5 159:20  
demand (20) 20:2 37:15  
38:19 39:24 40:1 42:9  
45:16 46:14 58:14 59:2,6  
62:5,9,14 64:16 66:15,15  
72:8,9,21 80:23 81:24 82:3  
88:9 102:11 128:6 154:11  
160:13 178:3  
demandside (3) 76:18 77:16  
78:1  
demonstrably (1) 170:2  
denial (1) 155:8  
deny (1) 151:19  
denying (1) 114:9  
departure (2) 175:14 176:12

dependence (2) 170:14  
189:14  
dependency (6) 16:20 17:12  
46:23 103:9 105:1 146:18  
dependent (6) 117:6 145:1  
160:25 169:14,17 170:19  
depends (5) 59:6 75:10  
142:13 170:20 171:25  
deposition (1) 187:4  
deputies (1) 187:2  
derived (2) 39:24 40:1  
describe (1) 117:3  
described (3) 63:4 103:2  
146:17  
describes (1) 103:13  
describing (2) 103:5 150:6  
description (1) 85:16  
descriptor (1) 19:21  
design (1) 75:15  
designed (2) 178:9,12  
desire (3) 32:10,11 156:22  
despite (1) 110:16  
detail (2) 72:25 130:5  
detailed (1) 19:18  
detect (1) 79:7  
detected (2) 190:14,18  
determination (1) 184:16  
determinative (1) 112:24  
determine (3) 11:12 129:19  
176:9  
determined (1) 181:13  
determines (1) 59:2  
develop (5) 111:4 131:7  
167:7,8 179:11  
developed (2) 108:12 167:4  
developing (2) 33:19 166:24  
development (3) 100:24  
163:12 169:19  
deviate (1) 156:23  
device (3) 4:4 103:25 127:3  
devices (2) 68:2,2  
dice (4) 97:23 98:2 99:5,6  
difference (38)  
17:18,19,19,23 22:24 23:1  
25:24 27:19 29:19,19 48:5  
51:6 55:21 56:5,14 57:22  
62:24,25 64:12,23 65:5  
67:8 68:2,5 70:25 77:24  
78:17,19 80:10  
89:10,11,15 115:3 126:25  
139:16 146:16 161:18,25  
differences (12) 17:16,22  
18:21 27:25 28:1 57:8 64:7  
69:16,19 91:8 94:21,21  
different (81) 6:5 8:10 16:17  
17:24 19:25 22:21 23:9  
24:10,13,21 25:9,22  
27:2,2,23,24 29:22  
35:19,20 40:25 41:25  
43:6,16 44:2  
55:7,9,12,13,17,17 57:13  
59:24 62:5,9,14 63:3 64:24  
65:8,10,10,21,25 66:24  
68:12 69:17 71:10  
73:13,15,16 77:4,15 78:18  
79:1 85:1,3 88:2 93:11  
94:22 100:16 113:7 123:19  
124:8 130:3 134:5 145:6  
146:13 147:20 149:13  
156:3,11 157:3,4,8 158:9  
160:1 167:1,9,10,10 173:9  
183:11  
differentiated (1) 89:17  
differentiation (5) 56:6  
71:6,10 72:18 81:25  
differentiator (1) 73:22  
differently (2) 122:7,8  
differing (1) 126:16  
difficult (7) 23:20 49:5 54:21  
75:2 76:25 86:24 125:4  
difficulties (1) 111:11  
difficulty (2) 166:14 181:15  
dignity (1) 81:15  
dilution (2) 40:18,20  
dimension (6) 37:21  
66:18,24 79:21 84:4 87:23

dimensions (8) 34:4 66:6  
76:2 78:23 125:2  
163:10,10 165:25  
dinner (1) 43:22  
direct (3) 15:3 122:3 184:10  
directed (1) 155:22  
direction (5) 37:16 54:18  
157:24 170:16 172:11  
directly (7) 27:18 43:1  
118:23 120:14,20 134:20  
180:25  
disable (1) 116:18  
disabled (1) 30:8  
disadvantage (1) 188:11  
disagree (6) 15:11 61:2  
75:16 83:8 89:19 144:23  
disagreed (1) 77:14  
disagreeing (1) 186:14  
disagreement (4) 19:16  
91:25 99:12 128:22  
disambiguate (1) 38:7  
disciplinary (1) 150:8  
discipline (11) 21:25 42:13  
53:18,20 106:25 107:17,21  
125:22 160:3 161:4,5  
165:14,22 166:6,15  
181:20,25  
discontinue (2) 140:24  
176:19  
discrete (3) 47:6 61:5 137:9  
discretion (9) 57:21,24 58:14  
60:20,24 61:13,13 63:5  
160:23  
discrimination (5) 23:13,16  
24:8,9,22  
discuss (1) 136:20  
discussed (6) 2:1 12:21  
16:18,18 54:21 69:9  
discussing (7) 16:11 37:24,25  
79:21,24 101:11 135:10  
discussion (19) 15:16,25  
16:12,17 21:5 22:6 36:17  
53:16 54:12 61:11 67:19  
76:11 78:22 95:6 124:4  
147:14 173:3,21 190:23  
discussions (2) 54:8 79:5  
disentangle (2) 23:20 179:24  
displace (1) 119:4  
display (1) 42:11  
dispute (8) 2:7 5:8 14:23  
50:4 91:3 107:7 130:2  
147:6  
disputed (1) 83:1  
disputes (1) 172:2  
disregard (1) 82:7  
disrupted (1) 140:4  
dissuaded (1) 137:25  
distinct (3) 52:23 63:9 89:25  
distinction (21) 1:13 2:3,20  
5:15 7:1,11,25 8:1 11:4  
18:12 25:1 28:8 31:20  
36:21 55:10 67:4 93:3,5  
97:5 122:23 127:9  
distinctive (1) 124:9  
distinguish (3) 24:19 84:20  
86:25  
distorted (1) 176:24  
distortion (1) 178:5  
division (1) 28:17  
document (2) 33:21 191:3  
documents (2) 131:22 190:8  
does (118) 5:18 12:14  
13:18,19,19 15:9 16:5  
20:12 21:16 22:6,24 25:12  
29:8 30:12 31:7,13 32:25  
33:8 35:7 37:14 42:5 44:10  
45:5,6,12 46:3,7 50:25  
51:3,8 53:6,25 55:13 56:15  
61:6 63:4,12 64:19  
65:3,13,17 67:7 69:4,16,18  
70:23,24 71:20 73:2  
74:14,20 76:4 79:17 80:1,2  
84:4,25 86:25 87:5,16  
88:18 91:7,11 92:3,8 99:9  
101:5 104:8 106:3 108:19  
113:13,14 117:9 120:8

124:18 126:13,22,24,24  
127:4,11 128:5 130:14,19  
132:11 133:3,13 147:10  
159:9 155:15 156:6,6  
158:5 160:21 161:1 163:5  
164:1 165:8 167:16  
168:10,16,19 170:10,15  
174:1 175:13,21 176:7  
177:9 178:5,6 179:14,20  
180:3 185:15,16,17 186:18  
188:14  
doing (23) 3:6 37:2 39:24  
58:11,13 71:12 73:10 92:7  
96:8 99:1 101:19 105:23  
115:22 116:2 121:14,15  
122:17 132:24 135:11  
138:4,4 171:13 188:25  
dollars (3) 52:6 95:20 152:21  
dominance (16) 28:12 36:11  
73:1 78:13,22 107:13  
180:3 185:15,16,17 186:18  
148:12 158:23 163:7,8,8  
164:2,4 165:19 166:13  
185:14  
dominant (19) 15:8 22:22  
36:3,4,4 53:8 125:21  
142:20 164:4,5,7,19,19  
165:14,22 166:6,15  
181:20,25  
dominate (1) 102:11  
done (13) 9:21 34:16  
51:23,24 64:22 69:14  
96:21 98:11 143:9,14  
155:20,21 191:5  
doses (1) 167:10  
doubt (3) 73:12 74:10  
179:12  
down (14) 17:20 34:1 38:20  
57:11 65:11 86:14 100:22  
123:5,6 144:17 149:13,18  
160:5 181:4  
downplay (1) 127:22  
downstream (1) 41:17  
downward (1) 84:14  
dr (225) 9:8 11:3,10,14  
12:16,25 13:5,17 15:10,11  
17:5,15 18:6,9,14,17 19:18  
20:8,21 21:20 22:9 23:5  
24:1 25:16,17 26:8 27:8,17  
33:12,13 35:24 36:21  
37:3,6 39:4,19 41:19 42:25  
43:19 44:8,13 45:8,12  
46:1,25 49:9 50:2,20  
51:8,18,23 52:13,16  
53:10,14 56:12,13,24 57:2  
58:2 60:5,10,12,17 61:2  
66:1,2 67:2,9,14  
68:8,20,24 69:7 70:19,24  
72:10,12 73:12 75:9,20  
76:17 77:5,14 78:17,21  
79:4,9,20 81:5,10,14,16,22  
82:18 83:6,8,15,21  
85:7,13,19 86:2,13,17  
87:8,18,25 89:15,19,20  
90:8 91:24 92:13 93:2,16  
99:10,11 100:20 102:18,22  
103:19,21 104:1,10  
107:5,6 108:21,24 109:25  
110:2,19,20 112:21  
114:1,4 115:1 117:12,13  
118:17 119:25 120:10,17  
121:3,10,14,17,22 122:24  
123:8,12,17 124:12,14  
125:14 126:15 127:14,16  
128:19,20 129:1,12,14,23  
130:22 133:25 134:1 136:8  
137:6,13,18 138:8  
139:8,9,12 140:13,18  
143:7 144:23 146:8,9  
147:12,18,25 148:3,25  
149:20,24 150:1 151:2  
152:9 153:24 154:25  
157:11 158:6 161:21,22  
162:23 163:7,18,22  
164:3,7,10,17,20  
165:17,21 166:18  
167:12,19 168:15  
172:5,6,9 174:12,14

176:13 177:5 187:25 188:2  
189:23 190:8 193:3  
dragonfly (1) 179:10  
dramatic (1) 124:17  
draw (3) 73:16 75:2 150:1  
drawing (1) 157:13  
dregs (1) 135:17  
drift (1) 54:17  
drive (1) 122:9  
driven (5) 65:20 79:22,23  
81:24 87:21  
drives (1) 78:2  
driving (4) 40:5 61:19,20,22  
drug (1) 167:10  
due (10) 2:24 6:7,21 8:2  
36:14 61:11 118:17 166:19  
190:10,11  
duration (2) 109:1 147:5  
during (7) 5:13 54:1 79:5  
82:20 106:21 136:23 148:5  
duty (1) 10:18  
dynamic (3) 120:15 167:19  
168:2  
dynamics (4) 135:9 137:5  
162:21 169:11

---

E

earlier (19) 28:18 57:16  
64:18 67:6 68:7 77:11  
88:15,25 91:1 95:6 98:20  
112:4 113:21 114:3  
136:4,22 144:16 168:1  
191:7  
early (1) 34:11  
earning (2) 151:14 155:11  
earth (1) 87:17  
easier (3) 90:4,6 125:4  
easily (1) 13:25  
easy (7) 24:18 60:14 90:11  
129:21 130:17 132:2 144:2  
economic (13) 15:22 27:11  
29:13 38:13,14,17 105:17  
114:20 162:19 174:9,9  
175:16 185:11  
economically (2) 114:19  
121:19  
economics (7) 38:19 52:17  
92:15 127:18 141:21 158:4  
169:11  
economies (13) 96:3,5  
99:13,14,21 100:7 101:12  
102:14 111:13,14  
112:2,22,24  
economist (3) 48:13 139:13  
159:7  
economists (1) 92:1  
economy (1) 112:13  
ecosystem (1) 62:11  
ecosystems (1) 67:23  
edifice (1) 181:4  
effect (9) 14:7,10,11 15:24  
40:18 107:21 109:6 151:22  
188:5  
effective (10) 42:24 44:11  
74:17 98:21 110:7 124:12  
161:10 180:14,16 182:12  
effectively (4) 40:19 86:25  
147:3 163:3  
effects (7) 24:10 94:23 96:12  
97:8 165:4 177:8 188:3  
effort (5) 37:16,17 39:21  
42:12,21  
efforts (2) 43:7 122:19  
eg (1) 25:10  
eighth (8) 47:17 59:15 70:4  
85:20 95:13 103:3 175:13  
178:15  
either (20) 3:25 6:18 11:7  
43:1 47:16 51:11 91:22  
110:17 118:2 121:2  
125:2,3 134:20 138:18  
142:11 156:7 157:24,24  
162:16 166:13  
elaborate (2) 42:22 161:22  
elaborating (1) 35:25

elastic (6) 33:5 41:17 49:17  
63:21 74:21,23  
elasticity (1) 40:17  
element (4) 15:3,4,6 156:25  
elements (5) 15:3 16:5,7  
177:18 189:8  
elides (1) 87:2  
eliminated (2) 123:8,9  
else (23) 23:19 32:24 46:17  
54:3 80:5 88:1 100:25  
115:13 119:20 123:6 135:2  
136:12 145:3 148:15  
160:22 162:6 168:13,20,20  
174:2 175:23 176:4 178:6  
elsewhere (2) 114:17 133:19  
email (2) 129:22 187:6  
emails (1) 130:9  
emergence (1) 113:6  
emphasis (3) 8:12 43:2 50:15  
emphasise (1) 10:11  
empirical (4) 151:4 152:5  
155:20,21  
encompass (1) 4:7  
encourage (4) 32:11 33:9  
39:14 118:6  
end (14) 12:1 14:3 22:9  
23:4,23 26:15 49:1 54:4  
57:12 78:5,8 119:5 186:22  
188:14  
endall (2) 73:8 97:9  
endconsumer (1) 40:8  
enddevice (5) 178:25  
183:6,9,11 184:6  
ends (1) 96:25  
energy (2) 122:13 138:3  
enforce (1) 141:1  
engage (4) 132:22 183:19,22  
185:13  
engaged (3) 138:25 143:5  
185:19  
engagement (1) 144:5  
engaging (4) 126:3 137:25  
168:9 184:16  
english (1) 8:12  
enjoy (1) 164:11  
enjoying (2) 164:13,14  
enjoys (1) 166:19  
enormous (1) 181:14  
enough (16) 26:11 31:21  
36:15 40:11,16,24 41:1,17  
95:7 96:9 97:2 100:25  
161:2 167:21 176:22  
180:15  
enter (11) 44:19 98:9 101:9  
102:10 103:7,20 107:16,25  
108:9 115:13 141:17  
127:21  
entering (2) 96:23 110:17  
enters (2) 98:23 103:12  
entire (2) 158:13,22  
entirely (1) 48:2  
entities (2) 89:1 159:21  
entitle (1) 138:21  
entitled (3) 139:1 183:23  
186:19  
entity (5) 58:9 112:6 156:20  
159:21 160:7  
entrant (14) 77:12  
92:3,5,9,12,20 93:2,7,20  
101:5,7 105:3 107:20  
168:21  
entrants (2) 103:10 106:22  
entry (94) 32:5,11 33:9  
36:10 48:13 91:17,18,22  
92:6,9,10,21,25  
93:15,19,21,23  
94:1,9,18,24,25 95:6 98:12  
99:22 100:5,8 101:8,17,24  
102:4,8 103:1,15,17,21,21  
104:3,8,16 105:1,4,19  
106:20 107:8,8,11,21  
108:1,4,5,6  
109:13,14,16,22,23,23  
110:2,6,8,9,14,17,18,23  
111:3 113:10,14

115:5,6,7,10,19,24 117:17  
 118:2,6,24 119:3,9,23  
 120:5,15,21  
 121:5,11,13,25 122:1,13  
 165:6 177:19 178:17  
**entryfree** (3) 92:15,16,19  
**environment** (1) 178:23  
**envisaging** (4) 136:21 181:16  
 182:5,7  
**equally** (1) 180:9  
**equilibrium** (1) 39:2  
**equivalence** (1) 41:7  
**equivalent** (2) 38:15 60:3  
**era** (1) 105:4  
**ericsson** (1) 89:3  
**error** (1) 79:4  
**errors** (1) 79:7  
**especially** (3) 99:15 111:10  
 150:10  
**essence** (1) 89:13  
**essential** (8) 115:14,17 132:1  
 133:15 162:1,2,4  
**essentially** (19) 15:2 21:10  
 41:14 55:18 60:20 68:21  
 95:10,24 103:8 105:9  
 106:1 116:13 125:22  
 138:13 149:1 168:8  
 171:5,6 184:23  
**establish** (1) 176:16  
**establishing** (1) 34:14  
**estimate** (1) 86:24  
**etc** (9) 23:10 62:17 89:3  
 100:21 162:6,10 163:9  
 181:3 185:14  
**europe** (7) 43:7,18 51:16  
 52:8,22,24 66:22  
**europen** (2) 48:9 174:18  
**evaluate** (4) 124:11 128:9  
 129:13 185:14  
**even** (42) 24:9 34:11 35:6,7  
 42:18 44:17 45:14,15  
 46:23 50:13 52:8,12,14  
 57:18 64:2 65:15,23 66:21  
 84:9 87:14 103:24 106:8  
 108:3 109:15 115:23 129:5  
 132:3 133:13 138:16,25  
 140:3,6 143:1 150:20  
 152:8 155:4 158:25 159:17  
 165:10 166:11 170:7  
 180:15  
**evening** (3) 135:19 189:21  
 191:13  
**event** (3) 35:20 49:14 65:6  
**eventually** (3) 102:10 108:2  
 119:3  
**evermore** (1) 139:3  
**every** (5) 26:18 32:15,15  
 137:21 163:20  
**everybody** (8) 15:14 23:19  
 46:17 111:4 119:14,20  
 133:3 135:2  
**everyone** (10) 12:14 63:16  
 123:6 135:13 136:12  
 178:6,10,11 189:20 191:16  
**everything** (14) 2:1 30:7  
 40:1 69:13 71:3 78:3  
 131:13 133:18  
 136:6,16,21,22 162:6  
 190:11  
**everywhere** (1) 148:15  
**evidence** (70) 1:13,15 3:13  
 5:25 6:6 7:14,15  
 8:17,21,23 9:22 13:15  
 14:19 15:21,22 17:9,10  
 20:24 24:23 25:5 30:1,2  
 31:13 37:23 43:10  
 44:7,8,11,14 45:19 47:16  
 48:7 49:4 50:9 51:7 52:18  
 54:5,14 56:11 58:4 61:24  
 63:11 67:25 69:17 70:11  
 72:13 95:8 98:6  
 99:22,23,23 101:16 102:24  
 104:12,24 112:23 127:19  
 130:6,7,8,9 135:3 138:23  
 143:20 151:5 156:18 179:4  
 183:13 188:5 191:12

**evolution** (1) 79:23  
**evolved** (1) 142:6  
**ex** (2) 97:3,4  
**exactly** (25) 4:10,14 23:6  
 26:21 41:1 52:16 60:6 69:6  
 81:21 87:18 93:17 111:19  
 112:10 114:11,13 134:17  
 138:20 151:16 161:16  
 172:12,14 175:5 184:19  
 187:2,20  
**example** (40) 4:4 16:2 21:4  
 24:22 26:1 33:21 41:23  
 43:4,17 49:3,17 51:25  
 55:25 57:5 82:21 87:3  
 88:5,23 91:4 92:24 93:21  
 97:6 102:2,7 104:13,20  
 105:2 129:6 131:2 145:10  
 150:2 164:6,20,21 165:21  
 166:5 182:2,3 187:22  
 191:19  
**examples** (1) 40:6  
**excursioning** (1) 174:5  
**excellent** (1) 78:11  
**exception** (1) 26:23  
**excess** (1) 118:11  
**excessive** (3) 46:14 120:22  
 164:14  
**excessively** (1) 114:8  
**exchange** (2) 123:24 188:1  
**exchanged** (1) 190:9  
**exchanges** (1) 168:1  
**excited** (1) 70:16  
**excitement** (1) 71:1  
**excluding** (1) 17:20  
**exclusion** (1) 175:11  
**exclusionary** (7) 174:17,18  
 177:8,8,22 188:3,5  
**exclusive** (1) 102:9  
**exclusively** (1) 36:6  
**exclusivity** (2) 48:21,24  
**excuse** (1) 154:25  
**excuses** (1) 158:7  
**excuse** (6) 114:6 116:1,14  
 125:5 138:2 144:18  
**exercising** (1) 117:3  
**exert** (5) 73:4 150:8,19  
 184:2 188:19  
**exerted** (1) 165:11  
**exerting** (2) 31:1 147:15  
**exhaustion** (2) 186:13  
 188:13  
**exhibits** (1) 69:22  
**exist** (4) 31:14 85:2  
 186:18,21  
**existence** (2) 61:13 138:21  
**existence** (8) 57:8 67:17  
 75:9 91:19 113:10,13  
 165:9 169:3  
**existential** (2) 147:8 159:1  
**existing** (5) 4:19 66:16 82:2  
 103:5,14  
**exists** (4) 15:25 37:22 60:24  
 154:12  
**exit** (9) 92:16,16,19 95:23  
 103:17 104:3,7,23 107:25  
**exited** (2) 89:6 104:14  
**expand** (4) 11:19,25 82:2,19  
**expanding** (1) 41:3  
**expansion** (3) 108:5,5 177:20  
**expect** (10) 10:24 14:21  
 29:21 49:20 60:22 77:9  
 156:19 163:13,14,14  
**expectations** (1) 172:10  
**expected** (1) 110:13  
**expecting** (2) 10:21 54:23  
**expects** (1) 96:8  
**expedient** (1) 103:6  
**expensive** (2) 64:1,2  
**experience** (2) 33:20 141:13  
**experiment** (3) 11:25 69:25  
 70:14  
**experiments** (1) 11:17  
**expert** (3) 20:9 79:5 154:21  
**expertise** (2) 10:20 174:10  
**experts** (4) 36:20 54:13,16  
 126:18

**expire** (2) 141:12,16  
**expires** (1) 167:15  
**explain** (6) 19:25 28:1 50:9  
 127:21 131:15 178:16  
**explained** (5) 3:13 10:5  
 14:20 45:18 156:13  
**explanation** (1) 17:7  
**explanations** (1) 186:11  
**exploit** (8) 114:17 118:20,22  
 120:23 121:13 150:7  
 163:23 172:25  
**exploitation** (3) 121:6,7  
 146:17  
**exploitative** (4) 117:22,24  
 175:2 177:6  
**exploiting** (3) 118:4  
 120:18,20  
**explore** (2) 117:23 160:18  
**explorer** (2) 165:2,5  
**expose** (1) 188:13  
**exposed** (1) 176:23  
**expressed** (3) 9:25 82:5  
 146:20  
**extend** (2) 141:17 166:11  
**extended** (1) 139:21  
**extending** (1) 166:22  
**extensively** (1) 187:23  
**extent** (23) 15:23 16:19  
 17:24 18:21 20:17 34:17  
 57:9 59:2 66:14 67:16  
 72:19 76:15 88:7 90:17,20  
 100:12 120:6,25 152:6  
 161:24 175:18 177:7  
 186:24  
**externalities** (2) 123:19,19  
**externality** (7) 119:19  
 121:24 122:4,25 132:24  
 133:23 134:23  
**extra** (5) 14:9 40:8 64:1  
 136:25 189:8  
**extract** (2) 153:12 175:10  
**extreme** (3) 156:4 165:21  
 168:17  
**extremely** (2) 150:24,25  
**eyes** (1) 8:13

F

**fab** (1) 83:6  
**fabless** (3) 80:19 83:2 84:4  
**fabricators** (1) 102:13  
**fabs** (4) 81:2,3 82:23 83:5  
**face** (7) 30:24 36:6 43:19  
 87:17 108:14 120:21 143:7  
**faced** (1) 67:13  
**faces** (3) 42:18 92:3,9  
**facility** (3) 162:1,1,2  
**facto** (1) 164:11  
**factor** (4) 46:21 91:6 128:18  
 175:19  
**factors** (5) 91:14 113:14  
 124:10 137:5 153:3  
**factual** (13) 20:24 25:5 66:2  
 98:6 102:24 123:20 127:18  
 130:1,20 172:2 181:15  
 185:19 189:9  
**failed** (1) 107:25  
**failure** (2) 108:11 179:9  
**fair** (4) 77:13 91:18 108:21  
 169:13  
**fairly** (5) 54:12 66:21 80:18  
 148:3,14  
**fallacy** (3) 31:9 32:3 35:13  
**falls** (2) 126:7 132:19  
**families** (1) 21:3  
**famous** (1) 77:21  
**fan** (1) 180:19  
**far** (9) 16:12 29:15 56:1  
 67:18 79:3 127:2 155:25  
 174:16 177:4  
**fast** (2) 64:20 131:9  
**favours** (1) 134:8  
**fear** (2) 129:1,9  
**fears** (1) 168:19  
**feature** (3) 22:6 65:24 73:14  
**features** (5) 22:5 81:17,17  
 115:8 176:8

**feel** (7) 109:12,12 119:15  
 170:19,25 172:13,14  
**feeling** (3) 170:21 171:3  
 176:22  
**feet** (1) 166:16  
**felt** (7) 61:25 137:25 138:1  
 144:13,14 170:24 171:1  
**few** (10) 21:2 37:10 57:21  
 60:4 94:10 107:6,24 126:6  
 137:5 189:17  
**fewer** (3) 26:23 51:16 64:14  
**fiercely** (1) 24:16  
**fifth** (1) 112:17  
**figure** (10) 60:10 70:3 84:9  
 147:24,25 149:21,21  
 151:16 154:23,23  
**figures** (9) 19:11 50:10 60:7  
 83:11 87:10 149:22 154:22  
 155:2,20  
**file** (3) 83:10 102:4 166:10  
**filing** (2) 190:15 192:3  
**filled** (1) 26:12  
**finalisation** (1) 191:3  
**finally** (2) 35:24 107:20  
**find** (13) 14:6 22:2 24:1  
 40:16 46:13 61:4 67:22  
 124:3,24 125:6 148:22  
 151:17 190:25  
**finding** (1) 22:10  
**fine** (4) 1:24 95:18 102:20  
 136:14  
**finish** (7) 135:13,18 136:22  
 151:22 189:21 191:12,12  
**firefox** (2) 165:7,10  
**firm** (1) 163:4  
**first** (44) 10:8 11:1,2,3,10,15  
 12:2 21:6 29:11 32:4 33:15  
 41:21 50:3 53:10 55:11  
 58:9 63:14 78:13,16 95:25  
 96:14,16 99:13,24,24,25  
 101:19 107:7 109:23 110:6  
 118:1 119:5 122:17 124:13  
 125:13 128:20 132:12  
 137:6 141:3 143:8,23  
 174:5,15 178:21  
**fit** (1) 96:17  
**fits** (1) 96:16  
**five** (1) 55:3  
**fiveminute** (1) 53:22  
**fiveyear** (1) 108:17  
**fixed** (10) 33:19,23,25 34:5  
 46:11,18 92:4,7,18,19  
**flagged** (1) 79:4  
**flagship** (1) 58:17  
**flavour** (5) 4:13,14,16,25  
 5:22  
**flexibility** (7) 66:10,18,24,25  
 82:25 125:2,5  
**flies** (1) 66:19  
**flow** (2) 29:11 71:25  
**fluctuated** (1) 82:14  
**fluctuating** (1) 150:11  
**fluctuations** (2) 81:23 125:8  
**flying** (2) 180:20 182:17  
**focal** (2) 13:2,14  
**focus** (9) 12:16 17:5 37:9  
 44:6,16 56:17 129:14  
 148:12 156:2  
**focused** (2) 14:12 105:20  
**focusing** (5) 28:3 46:2 62:13  
 74:1 146:11  
**foldable** (3) 76:4,5,6  
**follow** (5) 1:10 66:15 102:12  
 104:9 172:7  
**followed** (2) 29:11 188:7  
**following** (6) 18:18 41:23  
 44:13 46:1 93:19 168:15  
**follows** (3) 27:17 37:6 118:19  
**fond** (2) 164:21,23  
**foot** (1) 170:11  
**footnote** (3) 95:15 179:4,18  
**force** (4) 33:5 46:6 116:11  
 126:12  
**forced** (2) 51:4 165:11  
**foreign** (1) 8:9  
**foresee** (3) 131:4,5,6

**foresight** (2) 131:13,13  
**forever** (1) 164:5  
**forget** (3) 23:6 47:16 187:2  
**forgotten** (1) 149:4  
**form** (8) 4:8 8:21 20:5 83:4  
 103:21 106:20 134:23  
 146:6  
**formal** (1) 138:20  
**formalities** (1) 9:11  
**formulated** (1) 93:18  
**formulations** (1) 167:9  
**forth** (3) 28:24 73:1 169:10  
**forward** (10) 13:15 61:14  
 136:6,16,21 137:1 138:12  
 170:9,11 191:14  
**found** (1) 60:13  
**foundries** (2) 81:6,12  
**four** (2) 56:22 112:17  
**fourth** (6) 50:10 56:20,24  
 60:7 83:11 146:20  
**fragmented** (1) 88:25  
**framework** (7)  
 11:9,9,11,11,14 14:4 51:20  
**frand** (27) 36:9 114:10  
 116:4,7,12,18 117:5  
 119:16 120:3 122:8  
 123:3,5,14,18 133:1,7  
 150:19 171:2,7  
 181:19,23,24  
 184:12,15,16,23 186:20  
**frankly** (6) 17:7 34:16 89:21  
 108:10 111:7 176:24  
**free** (7) 92:15,16,18 116:14  
 133:7,7 179:23  
**freed** (1) 170:13  
**fresh** (1) 99:5  
 **fresher** (1) 105:3  
**friday** (3) 190:16 191:8,25  
**friends** (1) 5:9  
**friend** (1) 15:11  
**full** (4) 31:24 32:1 50:7  
 137:20  
**fully** (2) 169:17 171:5  
**function** (4) 156:9 175:25  
 176:2,3  
**fundamental** (4) 19:15 25:24  
 27:19 146:15  
**fundamentally** (8) 25:21  
 75:16 78:22 130:22  
 148:7,8 158:20 185:23  
**funding** (1) 111:7  
**funds** (2) 111:1,9  
**further** (6) 11:1 29:9 30:8  
 60:4 97:22 161:23  
**future** (5) 46:24 164:2,4  
 166:13 172:10

G

**g** (2) 63:7,7  
**gain** (4) 114:14 120:24 152:7  
 153:5  
**gains** (2) 133:10 152:17  
**game** (3) 63:11 145:11  
 184:17  
**gap** (2) 94:4 108:17  
**gave** (2) 8:23 40:6  
**general** (4) 18:20 54:12  
 137:4 167:24  
**generally** (5) 82:15 88:25  
 127:2 142:3,9  
**generate** (1) 123:18  
**generating** (1) 122:25  
**generation** (6) 57:2 58:17  
 59:13 60:21 63:17 66:16  
**generations** (10) 17:25 18:2  
 55:9,13 56:19 61:7 65:6  
 68:12 69:17 113:7  
**geographical** (1) 52:23  
**geopolitical** (1) 105:8  
**geopolitically** (1) 105:17  
**get** (49) 2:17 7:3 8:14  
 10:21,22 24:12 25:4 33:24  
 36:16 40:3,11,18 41:13  
 44:3 58:22 60:5 62:18  
 70:16 72:22,25  
 97:1,2,12,24,25 98:19

104:21 106:11 111:9  
 116:13 119:12,13 122:6,15  
 123:4,15 124:24 127:16  
 128:6 136:5 138:18 141:23  
 147:2 149:3 155:9 179:24  
 181:10 186:4 187:1  
**gets** (5) 97:1 102:15 180:25  
 181:1 184:4  
**getting** (11) 7:6,9,20 14:11  
 30:11 31:8 71:8 94:11  
 96:24 139:9 170:4  
**give** (28) 9:22 34:21 37:15  
 42:12,13 49:10 56:23 63:5  
 94:23 114:25 128:9,15,17  
 133:17 134:9,11 136:2,10  
 150:3 156:20 159:7,23  
 160:3,6 163:24 164:6  
 172:20 178:3  
**given** (11) 11:24 21:21 35:18  
 43:5 44:14 79:3 94:20  
 104:10 140:12 158:10  
 162:15  
**gives** (12) 83:21 99:8 113:17  
 121:1 142:1 160:15  
 183:16,17 187:17 189:6  
 191:15,16  
**giving** (2) 160:9,10  
**glass** (1) 76:6  
**global** (2) 51:3 81:5  
**globally** (2) 26:25 51:11  
**goes** (15) 7:16 10:8 38:19,20  
 60:21 61:18 73:19 86:14  
 113:20 123:4 148:19  
 159:19 167:25 169:24  
 181:22  
**going** (103) 8:14,20 9:20  
 10:10 13:5 18:1 19:15 22:2  
 24:11,13 25:9 35:3  
 39:10,12 37:12,13,14  
 36:12,12,14,15 44:1  
 46:14,22 48:14,20,25,25  
 52:21 53:16,18,20 55:7  
 57:11,20 58:20  
 61:14,21,23 62:10 63:25  
 81:8,23 93:10 94:18 96:9  
 99:17 100:5,6,8,22 103:16  
 107:17,18 108:14 110:22  
 111:11 118:24  
 119:1,3,5,14,22 122:19  
 123:18 127:16 128:21  
 129:18 130:15 131:4,5,9,9  
 133:10 134:12 135:23  
 142:18 151:24 153:20  
 172:24 173:15 174:21  
 175:9 180:23,25 188:18  
**having** (11) 31:4 53:4 58:24  
 120:8 122:6 145:23 160:11  
 163:2 166:14 176:15  
 181:11  
**hd** (1) 64:21  
**head** (2) 22:23 155:3  
**headings** (2) 10:7 94:10  
**hear** (1) 79:16  
**heard** (8) 8:17 27:18 28:18  
 36:15 89:4 98:5 172:10  
 180:16  
**hearing** (2) 8:8 41:7  
**heavily** (3) 47:18 166:8,9  
**hedged** (1) 171:12  
**hefty** (1) 31:6  
**help** (11) 6:8 10:21,24 12:6  
 70:23,24 110:9 120:9  
 129:24 174:10 182:18  
**helpful** (9) 6:13,16 22:1 51:9  
 54:18 135:7 149:22 159:7  
 162:17  
**helpfully** (1) 78:15  
**helps** (5) 12:3 15:22 38:6  
 102:25 112:7  
**here** (55) 18:21 26:20 29:2  
 34:18 36:9 37:17 40:1  
 42:14 44:12 51:3 57:18  
 58:6 59:10 61:19 62:23  
 64:16,24 66:7 73:13 73:10  
 75:11 78:1 80:18 82:11  
 84:7,11 87:8 88:7,16 90:4  
 98:9,15 101:21 103:9,13

H

**half** (1) 141:15  
**hand** (2) 79:20 85

105:20 107:10 114:2 115:5  
 121:18 132:9 135:19 138:7  
 141:24 151:9 152:1 153:3  
 155:17 156:1 170:10  
 175:16 177:8 179:4 180:2  
**hes (1)** 18:14  
**hiding (2)** 149:2 150:14  
**high (46)** 19:14 23:9  
 31:4,10,21 34:9,10 40:17  
 74:10,11 75:24,24 78:21  
 79:10 80:23  
 82:12,13,13,17 84:24  
 86:11 98:8 104:4 117:20  
 113:23 114:8,15,22,23  
 115:2 117:25 118:4,13  
 119:2 120:2 122:2  
 148:9,16,16,22 149:12  
 158:21 171:1 180:23 184:1  
 186:7  
**highend (2)** 71:17,22  
**higher (10)** 29:21 32:7 35:6  
 75:3 91:3 114:7 117:20  
 118:8 147:7 173:9  
**highest (3)** 64:18 139:7  
 147:23  
**highlight (5)** 47:13 88:14  
 98:15 103:3 177:18  
**highlighted (2)** 122:11 179:7  
**highlighting (2)** 125:7 180:2  
**highlights (2)** 62:11 93:3  
**highquality (4)** 72:2 73:18,19  
 77:8  
**himself (1)** 73:12  
**hinder (1)** 120:9  
**hindsight (3)** 130:14,24,25  
**hinges (1)** 21:23  
**hisilcon (3)** 105:5,8,13  
**historically (1)** 6:25  
**history (4)** 103:17 104:2,20  
 112:5  
**hitandrun (1)** 107:8  
**hold (1)** 171:4  
**holds (1)** 30:25  
**home (2)** 72:22 185:17  
**homogeneous (1)** 73:11  
**honest (1)** 137:6  
**hong (1)** 179:8  
**hope (2)** 6:21 182:11  
**hottub (6)** 1:9 8:25 53:25  
 54:5,6 135:18  
**housekeeping (5)** 1:3  
 190:4,5 193:2,4  
**however (7)** 13:8 93:23  
 125:15 126:22 157:12  
 171:3 183:6  
**huawei (7)** 14:1 15:20 19:6  
 105:6,11,15 126:21  
**hundreds (2)** 152:21 156:6  
**hurdle (2)** 101:14 110:9  
**hurdles (1)** 92:2  
**hybrid (2)** 103:11 104:17  
**hypotheses (1)** 45:10  
**hypothesis (2)** 44:12 45:11  
**hypothetical (6)** 11:9 29:2  
 36:24 40:14 72:1 131:3  
**hypothetically (1)** 71:22

**illustration (1)** 165:22  
**image (1)** 180:20  
**imagine (4)** 15:12 111:17  
 184:5 185:21  
**imagining (1)** 40:7  
**immaterial (1)** 111:16  
**indirectly (2)** 88:2 187:10  
**immunised (1)** 181:11  
**impact (12)** 13:11 14:15 19:5  
 25:13 46:8,15 52:22,23  
 73:2 80:13 124:17 127:20  
**impactful (1)** 151:19  
**impacts (1)** 113:11  
**implement (1)** 7:7  
**implementing (1)** 126:17  
**implementors (1)** 116:12  
**implements (1)** 126:20  
**implicit (1)** 134:24  
**importance (2)** 18:19 102:1  
**important (32)** 3:12  
 10:11,14 18:17 19:10 34:3  
 44:13 46:8 51:11 55:22  
 128:13 139:2 141:13 142:4  
 56:17 61:10 73:10,14 74:3  
 78:17 80:7 86:22 91:6,9  
 93:15 101:7 107:23 111:16  
 124:20 137:7 141:8 145:8  
 146:10 150:24 178:24  
 189:5  
**importantly (1)** 134:24  
**impose (2)** 71:23 172:17  
**imposed (1)** 108:15  
**imposes (1)** 147:7  
**imposing (1)** 39:9  
**impossible (2)** 43:11 52:9  
**improvements (2)** 165:1  
 167:8  
**inaudible (2)** 22:9 174:19  
**incentive (15)** 32:8  
 117:20,21 119:10 121:9,10  
 122:22,22 132:14,19,22  
 133:4,4 152:24 168:7  
**incentives (5)** 43:3 119:21  
 122:16 133:6 185:12  
**incentivised (2)** 109:20  
 133:12  
**include (2)** 4:13 19:17  
**included (2)** 2:5 66:10  
**includes (2)** 19:21 70:12  
**including (5)** 17:19 18:24  
 42:21 124:1 182:23  
**incomplete (1)** 15:15  
**inconceivable (1)** 160:19  
**incongruous (1)** 64:19  
**inconsistent (2)** 75:5 163:2  
**incorrect (2)** 35:18 78:25  
**increase (8)** 35:15 37:11  
 40:10,21 42:8 45:13 154:9  
 157:15  
**increased (1)** 153:18  
**increasing (1)** 189:7  
**increment (1)** 99:1  
**incremental (1)** 92:17  
**increments (1)** 97:25  
**incumbency (1)** 112:14  
**incumbent (16)**  
 92:3,5,8,11,20 93:6,20,24  
 96:18 98:11,19 103:23  
 104:17 107:1 109:17  
 119:21  
**incumbents (3)** 98:14 103:9  
 109:12  
**incur (3)** 92:9 93:21 99:16  
**incurred (5)** 92:4,8,20 96:18  
 122:13  
**incurs (1)** 92:3  
**independent (5)**  
 100:13,19,20 146:22  
 163:10  
**independently (2)** 163:9  
 165:23  
**index (1)** 193:1  
**indicate (2)** 56:15,16  
**indicated (4)** 47:17 111:14  
 137:9 155:2  
**indicates (2)** 52:19 76:10  
**indicating (1)** 179:8

**indication (1)** 169:2  
**indications (1)** 167:11  
**indicative (2)** 56:6,7  
**indicator (1)** 79:15  
**indirect (5)** 15:4,6 138:10  
 146:17 169:2  
**indirectly (5)** 118:23  
 120:19,24 134:21 181:2  
**indispensable (4)** 75:14,18  
 76:7 118:21  
**individual (10)** 9:22 11:6  
 18:13 23:22 27:1 54:9 74:4  
 75:6 88:5 119:10  
**individualised (1)** 23:14  
**industries (2)** 97:5 109:13  
**industry (34)** 2:22 41:20  
 71:6 79:12,15,18 81:18  
 82:6 94:24 95:12,23,23  
 97:6,20 98:6 99:14 102:19  
 103:6,12 104:5,10,14  
 111:15 115:8 126:18  
 128:13 139:2 141:13 142:4  
 166:4 169:11 175:21  
 179:23 181:3  
**inevitably (1)** 119:14  
**inferences (1)** 157:13  
**infineon (1)** 100:22  
**infinite (1)** 53:2  
**infinitesimally (1)** 161:17  
**inflated (1)** 151:2  
**influence (2)** 15:1 45:22  
**influenced (4)** 16:2,14 47:9  
 81:20  
**information (6)** 60:5,6,13  
 84:19 129:14 135:6  
**infringed (1)** 115:16  
**ingenuity (5)** 110:24,25  
 111:2,3,6  
**ingredient (1)** 182:14  
**initial (1)** 188:2  
**initially (3)** 64:17 102:6  
 112:15  
**initiate (1)** 120:3  
**innovate (3)** 77:9 165:12,16  
**innovating (1)** 100:14  
**input (4)** 75:13,18 158:10  
 185:1  
**insight (2)** 170:21 175:16  
**insignificance (1)** 150:4  
**insignificant (1)** 112:25  
**instance (7)** 11:4 48:11 90:9  
 98:4,5 102:9 106:6  
**instances (5)** 30:11 31:1  
 107:25 108:4 138:23  
**instead (5)** 66:5 74:9 108:11  
 147:6 154:10  
**instruct (1)** 157:21  
**instructed (1)** 140:7  
**instrument (1)** 12:6  
**integrated (2)** 20:14 106:9  
**intel (15)** 100:25 102:4,10  
 103:5,11 104:16  
 108:10,11,12,18,22 111:7  
 129:10 131:5 145:14  
**intellectual (3)** 16:22 18:22  
 21:24  
**intellectually (2)** 18:24 22:7  
**intels (2)** 106:2 129:8  
**intense (1)** 67:13  
**intention (1)** 8:13  
**interactions (1)** 74:4  
**interested (3)** 30:16 45:23  
 81:19  
**interesting (8)** 69:25 70:13  
 93:13 102:23 126:10 134:3  
 147:13 164:3  
**interests (1)** 131:23  
**interface (1)** 3:3  
**interim (1)** 141:9  
**interjects (1)** 152:4  
**intermediate (1)** 143:10  
**internet (2)** 165:2,5  
**interpose (1)** 25:3  
**interpret (4)** 34:19 87:20  
 143:20 157:24  
**interpretation (10)** 6:2 8:10

60:18 88:12  
 134:7,14,15,17,19 168:17  
**interprets (2)** 28:18 159:5  
**interrupt (2)** 12:12 81:1  
**interrupted (2)** 110:19,20  
**into (37)** 1:17 8:3,14 14:24  
 31:8 39:21 46:21 54:23  
 61:9 70:13 71:8 84:4 94:11  
 95:22 96:7,24 98:20 103:7  
 106:4 113:24 115:23,25  
 116:3 118:12,12,24 120:5  
 127:16,21 128:18 133:17  
 137:16 141:17 166:13  
 175:19 176:11 184:4  
**introduce (1)** 9:15  
**introduced (2)** 3:23 176:17  
**introducing (1)** 176:10  
**introduction (1)** 66:4  
**intuitive (1)** 152:22  
**invalid (1)** 8:1  
**inverted (1)** 90:12  
**invest (12)** 101:1,14 111:10  
 122:24 123:2 163:24  
 165:12,16,17 166:7,9,25  
**investing (11)** 95:9 99:1  
 100:14,17 101:20 122:19  
 163:15 164:18 166:2  
 168:18,22  
**investment (13)** 95:5,20  
 97:11,24 98:20 100:24  
 101:20 106:8 115:10,10  
 166:20 167:3,3  
**investments (3)** 96:11 165:7  
 166:23  
**invests (2)** 53:5,5  
**involve (2)** 46:10 74:21  
**involved (2)** 10:12 183:4  
**involves (3)** 33:19 110:23,24  
**ios (3)** 67:5,11 68:2  
**iphone (6)** 25:11 34:22,25  
 48:11 49:19 108:7  
**irrelevant (3)** 50:3 84:18  
 162:15  
**irrespective (1)** 113:2  
**isolation (1)** 61:7  
**issues (5)** 8:15 36:17 49:16  
 54:15 186:13  
**its (7)** 5:11,20 19:3,4  
 20:13,24 26:1,3 30:24 36:5  
 37:25 46:9,21,22 47:2 53:5  
 56:9 61:15 63:7 65:21 67:5  
 75:14 83:22 95:7 97:22  
 100:1 101:18 102:3 103:13  
 105:11 106:9 108:12  
 120:25 139:7 140:4,7  
 143:25 145:12  
 151:3,12,13,13 152:20  
 154:13,13 157:5,6  
 163:23,25 164:1,4,13,18  
 165:13,13 168:19  
 169:12,21,24,25  
 171:12,21,23 172:25  
 183:1,16 185:4 187:18  
 188:20,21 189:1  
**itself (11)** 2:16 11:18 35:7  
 56:7 73:23 105:16 106:19  
 120:25 171:5,8,10

**keep (9)** 19:11  
 100:14,17,23,25 101:18  
 163:15 166:2 168:24  
**keeping (1)** 101:19  
**keeps (1)** 150:11  
**key (1)** 18:12  
**kick (1)** 170:15  
**kicks (1)** 32:3  
**killed (1)** 117:25  
**kind (26)** 5:15 14:23 15:23  
 19:20,24 20:1 25:7 29:8  
 30:20 31:8 36:2 40:20 41:7  
 42:1 59:12 69:18,25 72:24  
 73:11 74:14,22,24 76:21  
 106:7 169:10 178:4  
**kinds (7)** 90:17 133:6 142:8  
 152:22 180:4 185:20  
 187:15  
**knees (1)** 158:18  
**know (15)** 6:13 9:10  
 10:11,24 13:21,25  
 14:20,22 15:19 17:8  
 20:2,21 21:22 24:1 25:25  
 29:5,6 31:15 33:25 36:15  
 39:13 40:24 41:11 42:23  
 44:3 48:2,21 50:15 51:5  
 52:16 53:15 56:15  
 57:19,20 59:14 60:2 61:5  
 62:12 63:13 64:2 67:10  
 68:18 69:3,9 71:9,14 72:3  
 73:18,21 74:7 76:15  
 77:7,22,24 79:25 80:13  
 81:1,3 83:6,17 85:8 86:12  
 87:10,10,13 88:22 89:1,3  
 91:2,11,23 93:11 94:2  
 95:11,16 96:2,16 97:9,11  
 99:2 101:4  
 102:14,15,17,18 103:9,16  
 104:23,23 106:23,24  
 107:3,9 108:16 110:23  
 111:10 113:2 115:6,8  
 119:15,23 121:17 122:9  
 125:7 128:13,14 130:6,14  
 131:11 132:1 133:3 137:14  
 138:1 139:1,4,7 140:24  
 141:10,21 142:5,15,24  
 143:24 145:23 147:21  
 148:7,21 149:3 151:10  
 154:1 155:11,17 157:19  
 158:2,21 161:6,6 167:4,24  
 172:2 178:18 179:5 180:19  
 182:6,15 183:3,17,21  
 187:3 189:5 191:1  
**knowhow (1)** 98:25  
**knowledge (1)** 170:21  
**known (1)** 73:23  
**knows (1)** 46:23

**launch (14)**  
 48:11,12,16,20,22 49:2,11  
 50:1 59:1 65:6 119:16  
 122:8 171:2,7  
**launched (4)** 63:14 65:8,9  
 169:19  
**launches (4)** 65:16 66:15  
 165:2,5  
**launching (4)** 49:6 50:7  
 58:16 133:7  
**lawyers (1)** 158:7  
**lay (1)** 50:21  
**lead (1)** 82:22  
**leader (2)** 108:2,3  
**leadership (1)** 167:14  
**leadership (3)** 10:10 66:5 109:8  
**leap (2)** 110:9,11  
**learned (1)** 5:9  
**least (23)** 52:4 56:6 58:19  
 64:17 71:13 87:3,3 103:13  
 104:24 105:22 106:3,19  
 107:13 108:1 110:11  
 132:3,4 161:10 174:18,22  
 183:12 187:13 190:17  
**leave (2)** 21:21 177:3  
**left (3)** 49:23 86:7 183:10  
**legacy (1)** 171:15  
**legal (5)** 54:3,4 164:10 174:8  
 178:22  
**lego (1)** 20:25  
**lenovo (1)** 89:4  
**less (30)** 10:7 24:12,12 30:4  
 31:15 34:13 37:13 39:20  
 42:18 43:8 49:24 64:21  
 67:13,13 74:11,23,24 75:6  
 77:5 109:4 119:10  
 133:5,11 146:2 156:4,16  
 157:5 159:17 169:15  
 178:11  
**let (32)** 6:15 12:23 25:1 28:8  
 34:21,22 37:8 44:6 52:22  
 56:13 63:16 76:20,22  
 91:16 104:2 113:8,10  
 123:15 124:4 143:15 144:1  
 153:24 154:3,10,11 155:10  
 160:18 163:7 174:1 177:3  
 181:20 184:5  
**letter (2)** 9:16,24  
**level (16)** 19:25 22:22 37:1  
 40:12 41:17 50:14 54:13  
 71:24 72:4 74:19 75:1  
 113:16 150:18 173:8  
 186:15 188:14  
**levels (5)** 31:16 55:12 101:20  
 107:14 167:21  
**lever (2)** 58:24 114:9  
**leverage (20)** 14:9 17:2,3  
 19:3,4 73:3 113:23 123:4  
 131:21 132:8 146:18 149:2  
 150:19 153:19  
 160:10,12,15 183:1,2  
 185:10  
**leveraging (11)** 13:17 17:6  
 115:23,25 116:2,3 117:4  
 127:22 175:9 180:25  
 189:13  
**levers (4)** 42:20,23 46:23  
 61:1  
**levy (1)** 153:10  
**licence (16)** 1:21,21,23 2:21  
 3:17 4:17,19 5:2 7:22,23  
 147:2 175:20 179:9 181:5  
 182:4 183:23  
**licensed (2)** 2:4,4  
**licences (3)** 3:1 5:20 188:10  
**license (3)** 180:7 181:17  
 182:13  
**licensed (36)** 1:7,13,14  
 2:5,9,12,16,23,25  
 3:1,5,7,10,15,16 4:2,20,21  
 5:4,11,19 7:2,5,7,11,12  
 8:6 126:21 127:11 141:6  
 146:24 147:3 154:2,3  
 182:23  
**licensee (2)** 140:2,6  
**licensing (1)** 145:6 126:1

127:3 139:17,18 173:5  
 178:9 179:1 180:8  
 183:4,7,9,11 184:6 188:14  
**licensor (1)** 175:4  
**life (2)** 34:11,11  
**lifecycle (2)** 35:20 57:11  
**lifetime (1)** 34:8  
**like (38)** 10:4 20:10 22:17  
 26:14 27:5 33:14 35:24  
 44:10 47:7 60:23 62:7  
 75:11 76:24,24 83:8,10  
 86:17 89:2 91:12,20 98:10  
 104:13 132:8 134:24  
 139:23 149:20 150:1  
 153:13 154:22 160:18  
 161:22,23 170:5 171:2  
 173:17 178:10,10 188:2  
**likely (9)** 40:15 41:17 49:24  
 62:23 67:14 80:22 119:16  
 154:16 178:17  
**limit (3)** 42:17 161:16 163:6  
**limited (10)** 34:8  
 56:20 60:25 61:9 66:21  
 99:17 101:12 113:5 127:20  
**limits (1)** 141:23  
**line (14)** 52:14 83:18,21,23  
 84:2,15 87:9 118:18  
 148:25 150:2 161:15  
 173:19 179:20 188:6  
**linered (1)** 87:9  
**lines (6)** 73:16 75:3 83:15  
 85:14 147:25 167:1  
**link (4)** 131:23 132:6 176:17  
 188:17  
**list (2)** 10:3 135:8  
**lists (1)** 190:8  
**litigation (5)** 14:23 120:3  
 138:1 184:17 186:25  
**little (12)** 12:20 25:5 42:16  
 69:23 94:12 131:19  
 135:22,25 136:4 150:13  
 153:24 161:22  
**loaded (1)** 99:6  
**locations (1)** 27:2  
**logic (14)** 71:25 73:20  
 116:15 120:18 133:13  
 142:18 143:6 170:18  
 176:25 184:24  
 185:14,21,23 186:8  
**logical (2)** 29:11 53:10  
**logically (3)** 37:22 51:21  
 116:8  
**long (15)** 23:21 82:23 98:7  
 106:3,19 108:20 135:22  
 136:11 161:6 164:8,9  
 165:15,17 173:11 184:21  
**longer (9)** 6:12 110:13  
 116:19 123:10 151:1,24  
 165:14 169:14 170:19  
**longform (1)** 28:16  
**longrun (1)** 92:17  
**longterm (3)** 139:17,18  
 141:4  
**look (58)** 11:5  
 13:6,16,18,19,20 16:22,25  
 17:2,10 18:15 19:19 21:19  
 22:11,12 26:22,25 29:5  
 33:17 35:13 37:6 44:9 47:4  
 48:10 52:8 60:6 61:3 69:12  
 70:15,20 78:18 79:1,22  
 81:7 83:14 85:5 89:18  
 90:21 92:24 95:18 100:21  
 113:10 130:5 134:3,9  
 143:11 145:9,19 146:3,5  
 147:1,20,21 150:2 167:9  
 169:7 179:4,18  
**looked (3)** 3:1 31:16 143:10  
**looking (40)** 3:17 16:16,23  
 17:9,18 21:19 22:16 33:21  
 34:6 38:1 44:12,20,24  
 51:24 61:3 68:18 72:3  
 74:6,19 75:1 78:14  
 80:11,12,15 98:5 107:4

170:9,11  
**looks (6)** 26:13 27:4 61:7  
 92:15 154:22 174:21  
**lose (9)** 28:4 46:3 52:1 86:17  
 128:5 152:3 158:12,12  
 168:19  
**loses (4)** 40:13,15 148:6  
 185:9  
**losing (4)** 148:6 151:15  
 153:22 154:7  
**loss (2)** 153:3 164:24  
**lost (5)** 28:4 148:10 152:7  
 155:12,13  
**lot (36)** 21:5 23:11,18 26:22  
 33:13 34:12 42:4 48:17  
 61:24 65:2 73:17 80:2,3  
 86:24 90:23 96:24 97:12  
 113:1 118:1 126:8 128:10  
 130:1 131:7 133:10 143:4  
 148:10,24 151:14 152:2  
 161:18 168:3 172:13  
 183:25 184:6 186:16 189:6  
**lots (9)** 14:18 22:21 45:10  
 89:1 119:19,20 134:25  
 142:10 189:5  
**low (6)** 23:9 62:12,15 118:3  
 186:4,7  
**lowend (1)** 71:17  
**lower (17)** 23:17 24:14 34:11  
 75:4 76:1 102:15 118:7,8  
 119:12,13 122:1,15 147:6  
 158:25 169:24 178:2 186:5  
**lowering (1)** 119:24  
**lowest (1)** 139:7  
**lsi (1)** 104:18  
**lte (5)** 3:19 4:8 77:6 98:21  
 99:25  
**ltecdma (5)** 90:15 103:7  
 145:12,12 148:23  
**lteums (2)** 90:15 145:14  
**lteumsgsm (1)** 86:14  
**lumpiness (1)** 97:21  
**lumpy (1)** 97:14  
**luncheon (1)** 94:16  
**lunchtime (3)** 136:17 191:4,6

---

**M**

**macro (1)** 22:22  
**madam (10)** 5:7 6:19 7:17  
 9:12 54:11 136:19  
 173:15,20 191:1,21  
**magic (2)** 58:24 129:25  
**magnitude (1)** 34:15  
**main (3)** 17:5,17,19  
**mainly (1)** 114:8  
**maintain (2)** 167:14 191:25  
**makers (5)** 83:2 179:15  
 182:24 186:25 188:21  
**makes (12)** 13:13 46:1 48:17  
 73:23 77:24 80:10 89:18  
 133:5 152:15 168:3,4  
 186:16  
**making (17)** 5:14 30:4 48:8  
 53:2 58:9,10,12 61:18  
 81:2,12 83:7 88:16 152:20  
 157:7 163:20 164:14  
 181:23  
**manipulated (1)** 59:9  
**mankiw (1)** 92:14  
**manufacture (3)** 32:5 50:5  
 81:8  
**manufacturer (10)** 26:14  
 181:21 183:22  
 184:12,14,22 185:9  
 187:5,6 188:9  
**manufacturers (19)** 94:25  
 105:10 140:7 146:25 147:4  
 154:3 162:6,16 180:8  
 181:5,8,17 183:3,5,14  
 184:8 185:22 186:19  
 187:13  
**manufacturing (3)** 30:9 83:3  
 101:13  
**many (27)** 2:22 25:25  
 26:17,19 27:1,4,22 44:21  
 58:22 63:23 66:21 88:4

89:5 93:12 104:15 126:5  
 133:16 138:11 150:7 151:9  
 158:8 166:10,10,10,25,25  
**margin (9)** 37:12,13 44:2  
 46:5,5 62:17 63:21 151:12  
 154:7  
**marginal (2)** 34:2 64:2  
**margins (3)** 44:3 46:2 152:20  
**mark (20)** 38:25 39:11,16  
 47:22 56:3 70:16 72:18  
 91:10 98:9 104:14  
 105:7,12 106:2 119:21  
 122:16 126:23 133:20  
 149:15 167:22 169:16  
**market (328)**  
 11:2,5,5,15,16,18,18,19,20,21  
 12:1,5,15 13:4,7,7,17 14:2  
 15:7 16:23 17:18,25  
 18:2,5,7,7,15,20  
 19:7,11,13,14,20 20:5,7  
 21:16,21,25 22:16 24:22  
 25:7,12,13,14,15,18,19  
 26:7,8,11,13,19,23  
 27:9,9,12,13,15 28:3,5  
 30:18,25 31:14 34:21,25  
 36:5,6,22 39:3 41:3 45:22  
 47:18 48:18 49:3 53:7 55:8  
 58:11 62:10,11 65:3 67:24  
 70:1,22 71:15,16,16 72:23  
 73:6,11,14,25 74:2,3,16  
 75:4,4 76:9 77:15,23  
 78:2,6,14,15,18,21,23,25  
 79:10,12,14,15,21,22  
 80:1,2,9,11,12,13,14,15,17,23  
 81:19,20 82:7,8,16  
 83:17,18,25  
 84:1,11,18,20,22,24,25  
 85:2,3,6,7,16,17  
 86:6,7,10,11,18,23  
 87:5,11,20,21,23  
 88:1,3,6,10,21,24  
 89:5,9,17,23,24 90:3,11  
 91:9,11 96:23,24,25 97:1  
 100:1,2,4,10,15,23  
 101:1,3,5,6,25 105:24  
 106:22 109:7,8 112:23  
 113:1,4,11,22,24  
 114:7,12,13  
 115:6,23,24,24,25  
 116:1,3,4,6,10,15,17,17,20,23  
 117:3,4,5,6,8,9,16,25  
 118:4,5,11,12,13,20  
 119:4,4,5,12  
 120:13,13,16,18,21,23  
 121:1,6,7,13 123:8  
 125:15,16,16 126:1,2  
 130:12,13 131:21 132:4  
 135:9 137:5,8,8 139:6  
 142:6,16 144:4  
 145:20,22,25,25 146:12,23  
 147:19,21,22,22  
 148:4,6,6,11,13,15,20,22  
 149:2,7 150:12,16,17  
 151:1,20 152:8,17,24  
 159:9,11,22 160:2 162:21  
 163:2,5,8 165:8 166:3,19  
 167:3 168:12,21 170:7,15  
 171:1,9 172:25 173:1,1,4,5  
 174:24 175:3,9  
 176:9,10,11,11 177:9  
 179:18 185:15,16,17  
 187:2,18 188:4,18,20,23  
 189:4  
**marketing (10)** 37:17,18  
 42:12,21 43:3,7 52:24,25  
 53:1,6  
**markets (24)** 11:6 24:2,7  
 25:24 31:22 35:9 51:3  
 56:16 67:11,18 74:5 75:10  
 76:18 86:8,12 99:19 111:8  
 116:10 118:1 125:18  
 166:24 167:23 177:20  
 178:18  
**marketwide (7)** 13:11,14  
 22:18 25:15 72:4 74:19  
 75:1

**massive (2)** 134:10 163:15  
**material (4)** 67:20 89:22  
 99:10 167:21  
**materialise (1)** 141:11  
**materially (2)** 55:17 134:23  
**mathematical (1)** 152:18  
**maths (1)** 40:18  
**matter (9)** 5:1 6:20 7:16  
 50:25 51:4,8 53:16 150:23  
 172:10  
**matters (10)** 16:20 25:20  
 41:9 73:20 91:10 109:3  
 116:25 119:8 172:11  
 180:11  
**maximise (3)** 39:7 43:17,18  
**maximising (1)** 163:19  
**maybe (28)** 11:3 14:5 24:12  
 35:2 38:25 55:11 60:25  
 63:22 72:25 73:4 78:16  
 91:23 94:4 111:23 114:6  
 124:12 129:8 132:11  
 136:1,1,4 142:12 155:4  
 156:2 157:17 164:9 168:21  
 169:6  
**mean (110)** 13:16,16  
 14:2,4,6 21:15 22:23 23:14  
 28:15 31:3,7,13 37:14  
 38:12 42:5 47:12 50:20,25  
 51:13,13 53:25 60:16,17  
 61:18 62:11 68:10,21  
 70:10,15,17 71:7,9,25  
 72:13 74:6 76:5,23 79:9,17  
 80:2,3 81:18 82:8,18 84:25  
 85:10,10,14 87:15,16,16  
 88:16 90:11 92:22,24  
 93:10 96:22 100:17 102:15  
 104:6,8 106:18  
 113:9,13,20 119:18 123:9  
 128:8,17 129:25 133:3  
 137:21 140:20 147:9,17  
 151:11 153:6,9,19 155:19  
 156:16 157:3 158:8,8,9  
 159:4,19 161:4 166:21  
 167:11,18,18 169:12,13  
 170:14,17 174:8 175:13,22  
 176:7 177:24 178:14,15  
 180:2,16,17 181:14 186:15  
 188:22  
**meaning (2)** 84:5 130:25  
**meaningless (1)** 141:10  
**means (25)** 3:3 14:3 27:12  
 35:2 36:10 37:12 46:12  
 71:20 77:24 80:20 81:22  
 92:18 96:11 98:18 103:21  
 124:20,21 140:13 141:9  
 148:4 154:19 155:10  
 157:16 158:16 189:22  
**meant (4)** 68:23 112:19  
 136:15 137:22  
**meantime (1)** 106:17  
**measure (3)** 58:4 91:13  
 189:14  
**measuring (1)** 80:9  
**mechanism (19)** 14:15,17  
 20:6 38:4 57:15,16,18  
 58:5,7 115:2 120:1 124:8  
 134:16 138:10 146:16,18  
 150:5 151:25 187:1  
**mechanisms (2)** 14:14  
 138:21  
**media (1)** 169:22  
**mediatek (27)** 74:8,11,15  
 75:25 76:22,23 77:12  
 80:14,21,22,24 81:8,11  
 84:5 100:9 105:2 107:2  
 108:2,15 109:7 125:3  
 128:16 131:8 148:7,8  
 182:3 187:22  
**mediatekqualcomm (1)**  
 76:20  
**medieval (2)** 180:19 182:17  
**meet (1)** 59:5  
**meeting (2)** 139:14,22  
**meets (1)** 27:14  
**mention (4)** 153:6 186:10  
 190:5,12

**mentioned (12)** 38:3 45:18  
 46:10 57:10 82:1 87:23  
 99:15 100:7 101:14 132:24  
 177:5 187:23  
**mentioning (2)** 84:5 90:2  
**merely (1)** 126:24  
**merits (4)** 174:7,20,22 175:8  
**mess (1)** 129:10  
**messy (1)** 146:5  
**met (1)** 115:18  
**method (1)** 182:22  
**mfn (1)** 122:11  
**mfms (1)** 132:25  
**microsoft (6)** 89:2  
 164:22,23,25 165:12,16  
**mid (1)** 62:12  
**middle (2)** 74:22 123:5  
**might (75)** 3:16 14:7 15:1  
 23:1 27:6 29:10,13,20,22  
 30:4,5,15 31:24 32:1,10,12  
 33:3,6,7 55:16,19 56:7  
 59:15 60:22 67:22 73:3,17  
 75:6 82:15 83:7 91:8 94:12  
 102:21 103:24 106:24  
 118:7 120:21  
 122:2,2,3,7,8,9 124:13  
 126:2 129:6,7 131:19,22  
 132:3,12,13 133:9,11  
 135:21 138:24 147:10  
 151:22 153:7 155:14  
 159:18 160:16 161:4  
 162:25 164:13 166:17  
 167:19 170:8,25 171:2,4  
 180:9 186:24 188:22  
 190:19  
**migrated (1)** 88:2  
**million (7)** 58:25,25 59:3  
 154:22 155:11,12,12  
**millions (4)** 49:6 151:9,17  
 155:9  
**mind (8)** 13:13,16 59:18,19  
 60:10 111:22 157:1 178:24  
**minds (3)** 130:15 139:14,22  
**minus (2)** 93:24,24  
**minute (2)** 115:1 137:22  
**minutemyminute (1)** 142:15  
**minutes (1)** 55:3  
**missing (1)** 2:3  
**misstate (1)** 68:25  
**mistake (1)** 24:4  
**mistaken (1)** 108:7  
**mitigate (1)** 171:23  
**mitigated (1)** 171:15  
**mix (6)** 42:20 43:14 44:16  
 50:11 66:12 67:1  
**mixed (1)** 72:14  
**mmhmm (1)** 106:15  
**mno (2)** 48:19 51:25  
**mnoled (2)** 47:18 48:18  
**mnos (3)** 43:2 47:19 48:16  
**mobile (7)** 37:18 43:4 64:20  
 67:23 89:2 105:9 126:19  
**mobiles (1)** 99:19  
**model (7)** 14:21 27:4 64:4,5  
 65:14,14 177:2  
**models (1)** 64:24  
**modem (4)** 19:24 21:1,6,7  
**modems (1)** 20:25  
**moderately (1)** 98:1  
**modify (1)** 141:17  
**molecule (2)** 167:9,15  
**moment (5)** 18:2 48:14  
 136:18 19:16 166:14  
**moments (3)** 137:18,19  
 143:4  
**monday (8)** 135:17 136:17  
 189:23 190:20  
 191:13,14,19 192:4  
**money (12)** 96:6 101:2  
 110:24 134:10,12 151:15  
 152:2,6 163:15,24  
 168:23,24  
**monopolies (1)** 115:20  
**monopolising (1)** 166:24  
**monopolist (17)** 11:9 29:2,3  
 31:10 32:15 36:8,24 40:14

42:14 71:22 72:2  
 163:14,17,23 164:1,13,17  
**monopoly (23)** 31:4,5,18,24  
 32:20,21,23 33:3  
 36:7,8,12 42:1 120:24  
 121:1 163:20 164:10,13  
 165:3,4,20 166:7,11  
**month (1)** 107:15  
**monthbymonth (1)** 139:20  
**months (2)** 107:15 170:12  
**more (78)** 8:12 10:7,9 17:13  
 18:22 23:18 27:4 29:14,20  
 31:11,12 32:24 35:3 39:21  
 42:2,11 43:2,6 49:14  
 51:5,16 59:25 62:16  
 64:1,1,3 65:8 68:14 69:13  
 72:14,25 75:7 76:24  
 77:5,13 84:6,9 88:25 92:4  
 97:14,17 102:3 104:9  
 105:4 108:5 109:7 110:11  
 112:17 115:23 118:12  
 119:9 120:15 127:17  
 128:13 133:22 136:2  
 148:10 149:17 152:3  
 156:13 157:4 166:10  
 168:3,5 173:17 176:1  
 178:3,11 180:16,18 183:16  
 184:10 187:11,18 188:23  
 191:15,16,24  
**morning (2)** 54:12 192:5  
**moser (8)** 6:17 7:18 78:9  
 189:24 190:1,3,21,22  
**most (11)** 47:14 54:11,19  
 62:7 80:22 82:17 93:15  
 98:16 100:8 103:6 163:20  
**mostly (2)** 37:9 154:16  
**motivates (1)** 153:20  
**mount (1)** 123:3  
**move (17)** 17:14 25:1 28:8  
 42:24 55:7 71:5 78:12  
 81:16 91:16 111:12 113:8  
 123:21 135:8 144:13  
 172:21 174:1,3  
**moved (3)** 142:6 153:14  
 171:5  
**movement (2)** 113:3,4  
**mover (3)** 99:24,24,25  
**moving (2)** 81:9 143:19  
**much (32)** 8:7,24 23:13 27:4  
 28:19 29:4 32:15  
 37:16,17,18 42:2 43:8  
 52:7,24,25 65:19 69:19  
 88:25 109:7 113:4 123:25  
 127:21 154:14 156:9 165:8  
 168:5,10 171:11 181:18  
 186:5 192:6  
**multimode (12)** 2:4 3:18,18  
 4:1,6 5:21 30:7 98:17,18  
 99:3 112:4,10  
**multiple (2)** 65:9 99:4  
**multiplex (1)** 28:17  
**multisource (2)** 157:16,19  
**multisourcing (3)** 156:19,25  
 157:14  
**multitudes (1)** 100:6  
**mundane (3)** 156:14,15,16  
**must (4)** 69:14 100:3 139:12  
 154:19  
**musthave (2)** 63:18,20  
**musthaves (1)** 127:8  
**mutandis (1)** 37:8  
**mutatis (1)** 37:8  
**myself (1)** 124:3

---

**N**

**narrative (1)** 171:6  
**narrow (1)** 11:23  
**nasty (1)** 36:5  
**natural (3)** 69:25 70:13  
 115:7  
**nature (5)** 27:23 98:16 105:5  
 115:5 142:13  
**neat (1)** 36:16  
**neatly (1)** 133:22  
**necessarily (7)** 37:15 42:7  
 53:1 97:8 102:9 127:11

189:1  
**necessary (7)** 4:17,22 133:9  
 142:16 176:21 182:14,15  
**nessity (1)** 105:15  
**need (60)** 1:20,21 8:20 9:5  
 10:19 11:15 13:6 19:17  
 20:22 22:12 25:23 26:12  
 35:21 40:17 43:23  
 46:3,7,17 50:5 53:23  
 58:18 19:63 19:69-12  
 72:21 92:9 93:21 96:12  
 99:16 100:14,17 101:1  
 109:12 114:20 120:11  
 125:12 126:13,24 127:4,11  
 129:2,14 130:24 143:2  
 146:18 147:20 157:12,18  
 158:10 162:10 174:19,20  
 180:15 181:1,6 182:19  
 183:8 185:17 186:1 191:4  
**needed (3)** 7:7 95:20 111:9  
**needling (1)** 126:25  
**needs (2)** 1:18 15:6 18:10  
 22:20,22 33:9 35:12,13  
 56:10 58:15 77:19 102:23  
 127:1,10,17 145:19 146:2  
 155:15 164:3 182:25 183:5  
**negotiating (10)** 19:1,2  
 24:16 47:1,1 53:11 66:11  
 129:16 138:11 146:15  
**negotiation (14)** 15:20 33:11  
 122:10 133:17 134:5,6  
 139:14 141:17 143:5,10,13  
 146:19 153:1 175:20  
**negotiations (2)** 12:10,21  
 13:12 14:16,19 15:16,19  
 16:1,9,11,15,16 18:13  
 33:11 46:22 52:20 128:24  
 129:22 132:7 137:11,16,24  
 138:9 140:11 142:22  
 142:3,3 160:16 162:5  
**netscape (1)** 165:1  
**network (10)** 40:12 41:12  
 47:21 49:7,21,22,24 116:4  
 127:7 165:4  
**networks (17)** 37:20,20  
 38:16 39:5,6,13 43:4 44:25  
 45:2 47:15,16 49:12,18  
 50:1 52:5 66:20 151:11  
**never (2)** 129:11 137:24  
**next (20)** 17:14 25:4 29:18  
 57:20 72:5 73:25 83:7 84:8  
 86:4 91:16 94:10,19 98:23  
 99:1 102:12 112:7 124:1  
 166:25 172:21 190:16  
**nice (1)** 171:25  
**nicetohaves (1)** 127:8  
**ninth (3)** 47:17 152:12  
 154:21  
**ninc (3)** 182:22 185:13,23  
**noble (245)** 9:7,23 10:2  
 11:13 12:18,23,25 14:13  
 15:14,24 16:13 17:16,22  
 18:9 20:23 22:17,18 24:3  
 26:9,10,21 27:11  
 28:14,22,25 29:1,10,25  
 31:19 32:18 33:2 35:25  
 38:4,6,14,21,25 39:23  
 40:3,23 41:1 47:11,12  
 49:16 50:4,8 51:19,20  
 52:3,11 55:11,15 56:9  
 58:5,7 59:8,14,15,18,21  
 60:2,18 61:16,17 63:9,18  
 64:9 65:4 66:14 67:22  
 68:13,17,23 69:6,8,22  
 70:3,6,8,15,21 71:18,19,25  
 72:9,13 73:4,6 74:18 75:19  
 76:13,14 77:1,4 79:6,7  
 81:16 82:4,8  
 85:4,5,12,21,22  
 86:1,3,13,16,20 87:10,13  
 88:13 89:13,17 90:2,10,11  
 92:21,22 93:10  
 94:4,7,2

36:23 48:19 54:11 58:12  
 59:4 67:6 69:18 70:10  
 78:18 79:1 82:5 87:5  
 101:19 104:3 128:11  
 132:18 135:22 137:10  
 144:13,25 145:16,24  
 149:12 156:8 161:16  
 171:13 191:7  
 occasions (3) 125:4 180:7  
 187:14  
 o'clock (4) 94:13 136:3  
 191:19 192:4  
 october (2) 1:1 192:9  
 oem (32) 14:1 16:1 17:1  
 18:16 23:23 40:8,13,20  
 41:4 42:25 50:14 51:25  
 57:18 58:10,23 61:20 75:9  
 88:14,17,18 119:10  
 101:9,25 126:17 127:10  
 143:11,12 175:4 178:1,5  
 185:7 187:9  
 oems (5) 11:6 12:22  
 13:12,20,22 14:8 15:5,18  
 17:3 20:2 21:7 22:5,21  
 23:2,10 24:18 25:23 26:24  
 27:4,24 38:9,10,15 39:3,12  
 47:5 48:8 58:12,16 59:6  
 73:4 74:20,21,21,23 84:12  
 99:2 119:2,18,22 122:11  
 126:6 137:12 138:11  
 142:10,24 151:11 181:9  
 183:2,15 184:3,11 186:2,5  
 189:5  
 oemspecific (8) 16:24 21:25  
 24:2 25:14,20,20,23 28:3  
 offer (5) 21:13 38:21 39:4  
 77:8 134:12  
 offered (1) 64:10  
 offering (7) 38:15 39:3,7  
 62:6 63:24 64:13 72:20  
 offerings (1) 71:15  
 offhand (3) 59:14 60:3 87:13  
 offing (1) 41:5  
 often (6) 23:10,17,18 26:25  
 87:2 93:4  
 oftentimes (1) 157:14  
 oh (2) 164:3 191:6  
 okay (33) 9:23 11:1 14:2  
 33:2 40:7 51:13 59:22  
 60:19 63:19 68:5 69:12,15  
 76:23 78:4 79:3,8 85:4  
 94:3 104:2 111:12 123:11  
 130:25 131:16 133:24  
 135:7 154:17 162:17  
 172:8,16 181:16,21  
 190:2,13  
 old (1) 171:11  
 older (1) 171:21  
 oligopoly (1) 144:16  
 once (8) 54:6 60:20 64:25  
 65:7 90:22 101:11 115:14  
 167:14  
 onedirectional (1) 11:25  
 ones (9) 2:23 28:23 59:19  
 74:11 75:7 90:15,21 98:1  
 130:5  
 onesided (1) 180:2  
 onetone (1) 135:2  
 oneway (1) 13:3  
 onezero (2) 51:5 97:17  
 open (3) 21:21 54:20 61:1  
 opening (1) 25:8  
 operate (2) 99:3 176:1  
 operates (1) 65:20  
 operating (1) 121:18  
 operation (1) 94:20  
 operationalise (3) 52:3  
 174:10 175:5  
 operators (2) 37:19 65:18  
 opinion (2) 50:9 146:20  
 opinions (1) 9:25  
 opportunities (1) 172:20  
 opportunity (1) 26:3  
 opposed (12) 28:16 43:5  
 51:25 55:10 71:17 80:4  
 81:24 90:4 105:17 127:8

141:21 151:2  
 opposing (1) 113:9  
 optimal (1) 43:13  
 optimistic (1) 104:9  
 option (9) 14:22 21:21 40:23  
 84:25 105:9 140:23 144:19  
 170:2,3  
 options (12) 21:13 40:5  
 41:11 76:10 99:3 128:3  
 143:11 144:10 145:18,22  
 146:4,21  
 opus (1) 148:2  
 oral (1) 192:1  
 orchestrate (1) 42:19  
 order (36) 10:9 12:3 13:6  
 21:23 22:19 33:14 46:3  
 48:18 51:9 96:7,10,14  
 97:11,20 98:25 100:14  
 101:2 102:15,16 103:14  
 104:19 111:10 119:13,22  
 120:4 122:5,16 126:11,20  
 127:10 141:17 152:21  
 158:10 167:1 186:2 190:6  
 ordinary (1) 38:12  
 organically (1) 109:16  
 organise (1) 157:20  
 original (2) 173:12 191:17  
 originally (2) 30:11 48:12  
 others (10) 2:22 19:6 27:20  
 66:4 67:13 71:12 83:24  
 84:6 108:6 128:14  
 otherwise (9) 49:25 64:22  
 105:15 107:18 118:9  
 131:14 134:10 136:11  
 166:12  
 ourselves (3) 126:11 131:17  
 154:4  
 outcome (2) 15:1 26:5  
 outcomes (1) 176:10  
 outlining (1) 167:19  
 outside (4) 14:22 53:19 54:3  
 144:10  
 outsourcing (1) 83:3  
 outwith (1) 4:5  
 over (40) 33:18,19,23 34:4  
 35:22 42:9 45:22 46:11  
 47:6 54:1 57:11,19,20,24  
 69:20 73:4 79:23 88:3 89:6  
 93:1 94:2 100:1,2  
 101:21,22 103:10 104:22  
 112:13,15 135:15 144:4  
 158:22 160:15  
 183:2,2,16,17 187:17  
 188:20 189:11  
 overall (1) 18:5  
 overcharge (4) 153:10  
 154:14,15 155:16  
 overcome (6) 103:15 105:19  
 109:16 110:15,16 117:20  
 overcoming (3) 110:3  
 117:18,19  
 overemphasise (1) 65:4  
 overestimate (1) 87:6  
 overestimates (1) 84:2  
 overlap (3) 45:15 68:9,20  
 overlaps (2) 44:18 68:8  
 overnight (1) 107:9  
 overspeaking (1) 22:9  
 own (16) 20:13 26:3 56:9  
 95:7 97:8,22 106:9 108:13  
 131:7 169:12,20 170:13  
 183:16 187:18 188:20  
 189:1  
 ownership (1) 67:5  
 ozempic (1) 167:4

P

padilla (216) 9:8 11:3,10,14  
 12:16,25 13:5 15:10,11  
 17:5,15 18:9,14,17 19:18  
 20:8,21 21:20 22:9 23:5  
 24:1 25:16,17 26:8 27:8,17  
 33:12,13 35:24 36:21  
 37:3,6 41:19 42:25 43:19  
 44:8,13 45:8,12 46:1,25  
 47:3 49:9 50:2,20

51:8,18,23 52:13,16  
 53:10,14 56:12,13,24 57:2  
 58:2 60:5,10,17 61:2  
 66:1,2 67:2,9,14 68:24  
 69:7 70:19,24 72:10,12  
 73:12 75:9,20 76:17  
 77:5,14 78:17,21 79:4,9,20  
 81:5,10,14,16,22 82:18  
 83:6,8,15,21 85:13,19  
 86:2,13,17 87:8,18,25  
 89:15,19,20 90:2,8 91:24  
 92:13 93:16 99:10,11  
 100:20 102:18,22  
 103:19,21 104:1,10  
 107:5,6 108:21,24 109:25  
 110:2,19,20 112:21  
 114:1,4 115:1 117:12,13  
 118:17 119:25 120:10,17  
 121:3,10,14,17,22 122:24  
 123:8,12,17 124:12,14  
 125:14 126:15 127:14,16  
 128:19,20 129:1,12,14,23  
 130:22 133:25 134:1 136:8  
 137:6,13,18 138:8  
 139:8,9,12 140:13,18  
 143:7 144:23 146:8,9  
 147:12,18,25 148:3  
 149:20,24 150:1 151:2  
 152:4,9 153:24 154:25  
 157:11 158:6 161:21,22  
 162:23 163:7,18,22  
 164:3,7,10,17,20  
 165:17,21 166:18 167:12  
 168:15 172:5,6,9  
 174:12,14 176:13 177:5  
 187:25 188:2 189:23 190:8  
 193:3  
 padillas (11) 13:17 18:6  
 39:4,19 60:12 68:8,20 85:7  
 93:2 148:25 167:19  
 pages (2) 60:4 83:12  
 paid (2) 19:8 146:13  
 painting (1) 149:13  
 pandemic (1) 82:21  
 pandoras (1) 33:16  
 panel (1) 135:10  
 paper (5) 92:14 93:11,13  
 145:4 174:14  
 paragraph (8) 5:9 56:25  
 67:24 111:20 152:11,11  
 154:20 162:23  
 parallel (2) 97:5 105:21  
 parallelism (1) 113:1  
 paraphrasing (1) 182:11  
 park (1) 123:16  
 parlance (1) 27:11  
 part (28) 6:6 18:10 20:5,6  
 30:8 53:6 65:20  
 76:14,18,19 77:15 83:17  
 92:6,18 111:15,16,16,22  
 112:2 127:6 141:20 151:1  
 173:3 177:10 182:13  
 185:21 186:22,24  
 partially (2) 103:12 171:18  
 participant (1) 142:7  
 particular (30) 1:16,18 5:8  
 8:11 25:10 27:12 41:10  
 43:7 49:17 59:4 71:13  
 75:15,15,22 90:9,19 98:4  
 127:13 151:23 157:6  
 158:15 159:11 160:7  
 167:25 175:6,16 184:25  
 185:7,8 187:13  
 particularly (14) 44:16 48:17  
 55:20,23 77:12 90:20  
 95:13 124:15 132:25  
 144:23 151:12 164:21,23  
 190:1  
 parties (15) 6:25 8:13  
 78:6,14 129:16 130:2,3,10  
 138:22,24 139:15 141:16  
 142:4 143:5 161:7  
 party (1) 156:8  
 partner (8) 48:16,23 76:7  
 118:22 158:2 159:13,19  
 160:9

partners (1) 48:16  
 parts (2) 21:2,11  
 party (1) 138:18  
 pass (3) 97:18,18,19  
 passedon (1) 41:14  
 passes (1) 40:8  
 passon (1) 62:23  
 past (3) 103:10 136:10 174:6  
 patent (8) 7:21 115:15  
 166:7,19,22 167:14,15,15  
 115:15 118:14,23 127:10  
 patents (15) 1:7,14  
 2:4,12,16 3:16 7:3,5,12,22  
 115:15 118:14,23 127:10  
 166:10  
 pattern (3) 59:23,24 156:3  
 patterns (2) 37:7 63:3  
 pause (4) 133:11 135:9  
 137:3 179:21  
 pausing (1) 155:18  
 pay (15) 19:6 23:14 29:14  
 42:6 62:16 64:1,19,20 97:2  
 133:14 140:7,8 158:21  
 178:1,6  
 paying (11) 23:15,16 24:20  
 62:21 119:2 120:2  
 140:2,19 147:6,7 171:1  
 payment (1) 141:5  
 payments (1) 153:5  
 payoff (1) 97:1  
 pays (5) 23:17 173:8,9,10  
 178:11  
 peak (2) 148:15 150:12  
 penetrated (1) 49:3  
 people (30) 23:14,18 26:18  
 33:5 44:21 49:17,23 64:17  
 71:12 77:8,9 95:9 98:17  
 104:10,12,13,15 109:15,16  
 115:19 118:2 137:24  
 142:4,12 157:16 167:7  
 168:7 181:1 182:25 184:18  
 peoples (1) 130:15  
 per (9) 65:7,16 88:21  
 151:15,18 152:2,21 162:21  
 188:24  
 perceived (1) 74:10  
 percentage (2) 155:1 160:23  
 percentages (1) 155:1  
 perfect (2) 78:11 144:14  
 perfectly (1) 131:11  
 perform (3) 11:16 13:7  
 127:23  
 performance (1) 55:25  
 performed (1) 49:19  
 perhaps (14) 5:13 70:3 84:9  
 110:10,15 111:10 132:16  
 137:23 138:14 152:9  
 162:19 166:6 168:16 184:9  
 period (21) 30:20 45:22  
 49:11 55:20 57:5 61:10  
 64:17 70:20 77:10  
 106:20,21,24 107:11,15  
 109:1 110:18 144:22  
 148:14 164:25 166:18  
 169:9  
 periodhyperperiod (2) 138:14  
 142:17  
 periods (17) 57:4 77:6,11  
 82:19 142:19,21  
 144:2,4,24 145:10,13,15  
 146:6 164:8,9 165:15,17  
 persistence (1) 89:11  
 persistency (2) 83:9 84:8  
 persistent (1) 86:11  
 persistently (1) 82:13  
 person (2) 58:9 139:25  
 personally (1) 158:6  
 personnel (1) 104:5  
 perspective (2) 51:10 90:11  
 persuasion (2) 42:5 51:10  
 pharmaceutical (2) 166:4,18  
 phase (1) 66:16  
 phone (29) 3:23 4:15  
 5:21,21 34:23,23 37:19  
 40:11 45:24 46:21  
 47:24,24 48:19 49:2,6 50:5  
 57:7 59:1 62:17 64:3,7,14

65:9,10 73:19 88:17  
 126:19,21 169:19  
 phones (60) 2:5 3:6 4:12  
 25:6 26:25 35:1 37:13,14  
 38:1,1,16 39:4,5,6,7,20,22  
 43:1,1,8 44:9 45:1 46:14  
 47:18 48:14,15,15 49:2  
 51:16 52:5 53:5 57:6 58:17  
 62:6 68:6 64:11  
 65:13,17,19,21,24  
 68:10,12 74:13 76:4,5,6  
 98:17 126:23 127:11  
 154:18 157:5,6  
 169:22,24,25 171:8,11  
 185:5 186:1  
 phrasing (1) 144:20  
 physical (2) 102:12 175:18  
 picked (1) 5:7  
 picture (3) 143:24 149:13  
 150:3  
 pictures (1) 60:14  
 piece (3) 68:15 129:21 190:5  
 pinch (1) 77:20  
 piracy (1) 183:20  
 pissarides (1) 43:22  
 place (13) 12:2 23:24 37:17  
 50:16 51:2 70:20 96:15  
 101:3 109:24 110:6 118:1  
 122:17 137:11  
 places (2) 60:13 66:22  
 plan (1) 10:5  
 plausible (1) 131:12  
 play (4) 14:24 50:15 55:14  
 177:10  
 player (6) 46:12 100:15  
 103:6,14 108:9 175:24  
 players (15) 14:11 21:12  
 75:6 82:2 88:5 89:5 94:22  
 97:3 99:18 100:8 104:7  
 113:6 128:13 149:1 153:13  
 playing (1) 42:20  
 plead (1) 177:16  
 pleadings (1) 177:16  
 please (3) 135:24 154:24  
 178:20  
 plenty (1) 99:10  
 plus (6) 62:17 93:19,20  
 112:16,17 153:5  
 pm (5) 94:15,17 143:16,18  
 192:7  
 poe2117 (1) 59:16  
 poe2120 (1) 70:4  
 poe2143 (1) 95:14  
 poe2145 (1) 103:4  
 poe2148 (1) 111:23  
 poe2149 (2) 111:22 178:14  
 poe2183 (1) 175:17  
 poe2257 (2) 60:11 149:24  
 poe2278 (2) 83:13 148:10  
 poe2279 (1) 84:10  
 poe2344 (1) 152:12  
 poe2416 (1) 163:4  
 pointed (2) 35:12 108:4  
 pointless (1) 138:2  
 points (27) 6:22 16:17 23:17  
 47:12 56:18 57:13 65:21  
 66:2 68:3 77:4 102:21  
 118:20 128:4,4,11  
 137:9,10 138:6,8 139:6  
 141:8 143:10 146:13  
 147:20 160:23 162:19  
 177:2  
 policies (1) 178:8  
 policy (8) 178:8,17,21  
 179:14 180:3,5 182:13,24  
 politeness (1) 190:3  
 pool (1) 83:5  
 pools (3) 62:5,9,14  
 pop (1) 54:24  
 portfolio (10) 38:1,15,22  
 39:3,5,5 44:15 47:3,5 66:9  
 position (39) 4:16 6:24 14:8  
 22:12,19,19 61:25 71:18  
 89:16 93:16 101:3 105:23  
 114:5 120:11,25 128:25  
 138:3 140:1 142:6 148:3

154:4 163:20,23  
 164:13,15,18  
 165:3,4,13,13 166:2,6,16  
 167:14,16 168:20 169:5  
 177:11 179:14  
 positions (3) 22:21 126:16  
 129:20  
 posits (1) 39:8  
 possibilities (2) 85:2 181:24  
 possibility (4) 24:6 53:17  
 61:8 134:7  
 possible (19) 11:24 14:24  
 43:19 71:21 72:16 83:12  
 35:14,16,17,18,22 29:21  
 85:5 101:10 103:25 115:12  
 118:25 125:1,17 131:11  
 135:15 137:23 138:17  
 153:5 159:17  
 possibly (1) 69:12  
 poster (1) 24:21  
 postulate (1) 131:3  
 postulated (1) 120:1  
 postulation (1) 122:3  
 potential (4) 93:2 113:17,18  
 180:3  
 potentially (32) 13:11 22:25  
 23:4 30:17 62:17 64:4 91:2  
 96:11 97:13,21 106:22  
 116:9 125:21 130:19  
 132:22 133:3,5 136:22  
 138:23 142:12 152:3  
 153:22 155:9,10 171:20  
 176:11 177:19  
 183:15,17 184:21 189:7  
 power (83) 14:9 19:15 30:25  
 47:23 52:7 79:15 80:2,3  
 84:22,25 87:21 88:6 91:11  
 106:22 113:12,22,24  
 114:7,12  
 116:1,4,10,15,17,20,23  
 117:4,7,25 118:4,5,11,20  
 119:4,12 120:13,19,23  
 123:8 124:1,7,8,14  
 125:12,25 128:2 131:21  
 132:4 133:19,21 134:22  
 137:8 139:6 142:16 144:4  
 146:14 147:15 148:13  
 150:17,17,18 156:12  
 157:14,15,18 163:2,5,8  
 166:20 168:12 170:7,16  
 172:25 174:24 175:9  
 185:15,16,17 188:18,20,23  
 189:6,7  
 powerful (1) 121:4  
 powers (1) 124:12  
 practical (5) 17:16 18:22  
 19:25 134:2 138:12  
 practically (1) 51:23  
 practice (7) 3:14 11:23 17:17  
 141:2,11 188:23 189:3  
 practise (2) 3:6,8  
 practised (1) 4:2  
 precedent (2) 24:4 119:17  
 preceding (1) 124:4  
 precisely (11) 6:25 18:9  
 27:18 30:19,20 46:25 56:9  
 59:8 144:20 149:3 159:4  
 preclude (1) 21:16  
 prefer (3) 67:12 91:13 191:1  
 preferable (1) 191:21  
 preference (2) 89:25 90:8  
 preferences (1) 42:2  
 prelude (1) 1:17  
 premium (19) 29:7 30:13  
 31:3,6 33:15  
 34:9,10,14,19,20,25  
 35:4,7,11,22 60:23 61:23  
 62:6 67:16  
 prepare (2) 171:10 191:18  
 prepared (2) 9:18 171:8  
 preponderance (1) 17:9  
 presence (2) 91:12 132:25  
 present (4) 3:12 44:8 50:25  
 152:18  
 presented (3) 47:16 50:10  
 151:5  
 presenting (1) 36:2

president (2) 172:23 173:14  
 pressure (4) 24:14 43:9  
 165:11 184:3  
 presumably (2) 49:24 72:10  
 pretty (6) 29:4 32:15 60:17  
 144:11,12 181:18  
 prevalent (1) 47:15  
 prevented (2) 36:24 99:22  
 prevented (2) 101:17 113:6  
 previous (2) 75:13 149:9  
 previously (1) 54:20  
 price (86) 23:13,15  
 24:8,9,13,14,22 29:21  
 30:21 31:3,5,6,10,18,21,23  
 32:7,7 33:7,17  
 35:14,16,17,18,22 36:25  
 37:11 38:19 39:9  
 40:9,21,23 41:8 43:9 44:10  
 45:13,15 46:6 47:24,25  
 52:1 55:12,21 56:4,5  
 57:8,22 62:25 64:5,12  
 65:21 67:16 68:3,8,9,20  
 69:11,16,19 70:1 71:23  
 72:3 75:23 102:15 113:23  
 114:22 116:13,16,19  
 117:21 118:7,8,9,12,13,25  
 119:13 124:22 128:16  
 134:13 143:7,9 181:18  
 184:1 186:6,7  
 pricediscrimination (1) 24:6  
 prices (25) 1:2,5,8,10  
 23:14,17 24:21 28:1  
 29:24,25 30:2,23 31:4  
 32:6 34:1 35:3,6 36:8  
 37:24,25 43:12 45:2,6  
 47:10 51:24,25 52:15  
 53:11,12 55:17 56:14  
 57:10 59:6 66:11 68:11  
 69:20,24 91:3 92:15  
 109:19

102:13 148:9,17  
**products (41)** 1:13  
 2:4,5,10,23,25 3:3,5,7,15  
 4:11,18,18,20,21 5:5  
 7:11,23 11:17 19:22  
 20:3,4,6 38:23 44:2,15  
 53:4,17,19 55:16 58:18  
 63:24 65:2 71:11 83:16  
 102:10 111:5 129:3 132:6  
 168:25 176:9  
**profile (1)** 59:12  
**profit (4)** 151:12 153:4,23  
 155:12  
**profitability (1)** 124:17  
**profitable (1)** 39:20  
**profits (3)** 163:19 164:14  
 166:9  
**project (1)** 179:10  
**prolonged (1)** 110:18  
**prominently (1)** 42:11  
**proof (1)** 43:11  
**properly (1)** 114:17  
**proportion (1)** 83:25  
**proportions (3)** 47:7 49:13  
 63:7  
**proposition (3)** 74:14 147:16  
 166:15  
**propping (1)** 108:11  
**pros (2)** 68:15,17  
**prospect (1)** 14:25  
**prospective (1)** 170:15  
**protect (2)** 165:13,13  
**protected (1)** 165:4  
**protection (1)** 166:19  
**prove (4)** 174:19,21  
 176:17,18  
**proven (1)** 112:6  
**provide (13)** 2:24 10:21 14:4  
 37:18 43:3 67:22 79:14  
 84:19 86:1 106:5 111:1  
 131:10 175:15  
**provided (9)** 3:17 78:15  
 89:22,24 94:1 112:5 140:2  
 141:5 162:16  
**provider (1)** 76:6  
**provides (4)** 57:25 75:25  
 86:6 111:2  
**providing (1)** 122:24  
**provisionally (1)** 192:3  
**provoke (1)** 36:10  
**ptr (1)** 136:24  
**public (2)** 43:24 119:22  
**pull (1)** 46:24  
**purchase (1)** 80:4  
**purchased (4)** 19:21 21:6,7  
 104:18  
**purchases (6)** 26:21 83:19  
 85:17 143:21,22 146:24  
**buying (9)** 22:5 37:7  
 43:13 52:7 84:14 124:16  
 156:3 157:8,18  
**purdah (2)** 53:24 54:1  
**pure (2)** 4:25 104:16  
**purpose (2)** 119:24 121:25  
**purposes (3)** 1:24 3:12 67:19  
**push (6)** 7:18 16:25 24:14  
 37:16 44:1 61:14  
**puts (2)** 173:6,7  
**putting (1)** 6:23

Q

**qualcomm (155)** 3:14  
 12:10,11,21 14:17,17  
 15:7,17 16:2,9,9,16 18:25  
 19:1 20:24 22:5,13,21  
 24:15,15 28:12,18 29:3,6  
 30:12 32:1,10 33:7 36:3  
 37:25 42:15,17 46:9 52:20  
 53:12,18 55:24 73:3  
 74:9,9,16 76:22,24 79:25  
 80:2,4,14,21 83:22,23  
 84:12,16,23 86:10 87:4  
 98:6,10,13,20 99:25  
 100:10 102:2,6 107:4  
 108:13 109:2 113:15 114:6

118:6 120:11,19 121:14  
 122:5,11 124:16,20,23  
 125:5 126:13,22  
 127:11,17,20 129:7 131:4  
 132:4,7 134:8 137:11  
 138:2 140:25 142:19  
 143:22,25 144:3,4,24  
 145:3,3,11,13,19,24  
 146:2,11,21 148:5 149:11  
 153:12 154:1 156:5  
 158:16,17 159:10,20,24  
 162:4,7,9 163:1 168:18  
 169:14,21,25  
 170:4,14,23,25 171:14,17  
 172:1,3,14,17,24 173:6  
 175:23,25 176:16 179:9  
 180:22 182:4,23 183:12  
 184:13,25 185:4,9,13  
 186:17,24 187:7,17  
 188:4,11  
**qualcomms (30)** 2:21 3:14  
 7:13 46:15 80:1 82:16  
 83:16,18 84:1,11,13,16,24  
 87:21 113:11 119:12,17  
 124:18,21 125:8 139:6  
 140:1 143:21 146:22  
 147:22 177:9 178:8,16  
 187:24 188:18  
**qualities (10)** 29:12 56:3  
 65:10,12 72:10,20  
 73:14,15,17 77:15  
**quality (32)** 23:9,9  
 41:5,8,11,15 59:7 68:1  
 71:5,10 72:5,17 73:22  
 74:10,11 75:3,4,24 76:1  
 89:21 91:8,9 97:19 98:8  
 100:24 144:15 145:24  
 146:3 159:1,20,20 163:12  
**quarter (1)** 59:4  
**quasi (1)** 115:20  
**query (1)** 175:22  
**question (116)** 1:6,25 5:17  
 8:3 11:2,2,10 18:3,11  
 19:18 21:14,17 22:14,15  
 25:4 29:9,18 30:10,14  
 31:19 33:2 38:6,14,25  
 39:11,16,23 40:9 41:16  
 44:13 47:22 50:3,19 51:14  
 53:9,10 56:3 57:15  
 58:20,21 62:25  
 63:10,13,19 68:7 70:16  
 71:5 72:18 74:18 75:21  
 78:13,16 79:2,11 87:8,14  
 89:8 91:10,17,21,24 94:12  
 98:8,12 104:14 105:7,11  
 106:2 110:7 117:17,23  
 119:21 122:16 124:6  
 126:10,14,23 128:21  
 130:4,17 132:13,14,15  
 133:20 136:15,18 142:2  
 144:2 147:19 149:15 151:4  
 153:11,14,15 155:19,22  
 160:1,1 161:12,20 163:22  
 165:19 167:22 169:16  
 170:2 172:22  
 173:12,14,17,18 174:2,8  
 185:19 188:3,15 189:9  
**questioning (1)** 188:6  
**questions (18)** 9:9  
 10:6,10,13 36:13,16 54:19  
 63:9 75:12 78:8 94:10  
 124:2 137:4 143:19 172:21  
 174:3 189:17 193:3  
**quick (1)** 50:2  
**quicker (1)** 60:1  
**quickly (8)** 57:21,23 59:13  
 62:1 63:6 67:3 109:8 166:3  
**quite (38)** 14:24 20:17 21:5  
 23:20,21 24:9 26:5,22 31:6  
 32:18 50:18 58:23  
 59:10,24,24 60:25 77:10  
 82:24 84:16 86:23,24  
 91:1,6 93:13 94:20 105:13  
 108:10 126:6 128:10  
 134:22 135:11,14 137:5  
 142:7 143:24 148:24

149:12 187:23  
**quote (5)** 92:13 95:13,15  
 103:2,5

**R**

**raft (1)** 142:25  
**raise (5)** 54:18 72:3 78:7  
 131:20 150:17  
**raising (2)** 32:16 36:25  
**ramp (1)** 106:22  
**rand (1)** 92:14  
**range (7)** 26:24 65:11,18,19  
 72:1 156:9 157:2  
**ranges (1)** 44:10  
**rapid (2)** 60:17 62:2  
**rate (16)** 113:24 114:15,23  
 119:13 122:15 123:5  
 133:15 135:1 139:3,3  
 140:11 168:8 180:24  
 181:10 186:4,4  
**rates (3)** 119:24 131:24  
 133:18  
**rather (8)** 8:16 105:23 115:2  
 117:23 135:16 138:8 173:1  
 190:9  
**rational (3)** 96:8 132:5,9  
**rationale (1)** 117:11  
**rd (12)** 95:10 96:18 99:15,16  
 163:1,5 167:21  
 168:6,8,8,18,23  
**reach (1)** 79:19  
**reached (5)** 32:2 33:4 72:22  
 74:15 105:22  
**read (11)** 9:18,19 22:1 63:11  
 82:10 95:17,19 134:6  
 179:19 180:6 191:24  
**readily (1)** 164:12  
**real (5)** 38:6 64:23 101:13  
 125:11 129:9  
**realise (1)** 51:10  
**realised (1)** 187:8  
**reallife (1)** 29:3  
**really (48)** 11:22 19:16 21:23  
 22:15 38:8 40:4 47:12  
 49:19 51:8,14 58:22 61:19  
 62:13,20 67:9 79:14 80:18  
 81:1 89:10 92:23 98:8  
 105:9 115:3,15,16,16  
 119:8,20 124:6 125:14  
 126:14 128:14 130:16  
 132:17 133:9,21  
 161:7,8,12 171:25 173:16  
 175:22 176:6 178:9 182:6  
 185:15 186:4 191:9  
**reason (14)** 5:19 14:13 18:25  
 32:4,18 33:3 44:14 46:1  
 112:25 124:14 132:10  
 146:24 171:17 179:16  
**reasonable (5)** 44:19 47:8  
 75:22 101:20 156:5  
**reasons (12)** 28:13 31:25  
 33:8 45:18 72:17 76:17  
 105:20 162:13 178:16  
 179:10,12 186:17  
**rebates (1)** 157:22  
**recall (4)** 16:12 59:25 108:21  
 188:2  
**received (2)** 10:3 67:25  
**receiving (1)** 171:14  
**recent (1)** 169:18  
**recently (2)** 65:23 174:15  
**recognise (4)** 73:10,21  
 109:21 161:24  
**recollection (1)** 60:2  
**reconciled (1)** 50:12  
**record (1)** 102:19  
**recurring (1)** 92:5  
**red (15)** 41:25 42:1,4,9,10  
 44:21 45:4 83:15,23  
 84:2,12 85:14 148:1,25  
 161:14  
**redacted (2)** 55:1 135:6  
**reduce (6)** 46:8,22 103:25  
 122:19,20 134:22  
**reducing (1)** 160:3

**reduction (4)** 46:4,6 134:16  
 135:1  
**reemphasise (1)** 10:23  
**reexamination (1)** 173:18  
**refer (3)** 162:18 174:14  
 180:5  
**reference (11)** 35:11 67:22  
 69:8 83:10 85:8 149:4  
 151:7 152:10,13 155:2  
 187:3  
**references (1)** 93:12  
**referred (3)** 14:19 35:13  
 60:10  
**referring (10)** 2:19 15:25  
 50:13 54:14 59:15 70:3  
 76:12 112:1 138:9 177:13  
**refers (1)** 165:25  
**reflect (1)** 123:24  
**reflected (1)** 44:3  
**reflects (1)** 57:9  
**refusal (2)** 180:7 182:13  
**refusing (1)** 184:3  
**regard (5)** 15:19 25:14  
 109:11 151:5 171:25  
**regarded (1)** 166:21  
**regarding (2)** 12:11 190:14  
**regardless (3)** 3:7,15 40:21  
**regards (3)** 6:11 157:4 165:3  
**regime (4)** 116:12,18,25  
 117:5  
**regret (1)** 37:1  
**regulated (3)** 116:13,16,19  
**regulation (1)** 118:15  
**reign (1)** 71:1  
**relate (2)** 12:14 138:7  
**related (8)** 7:20 21:10  
 29:24,25 55:8 112:22  
 156:15 188:23  
**relates (2)** 12:13 15:5  
**relating (1)** 1:7  
**relation (3)** 9:11 16:8 87:8  
**relationship (1)** 17:11  
**relative (9)** 8:12 42:9,16  
 47:9 69:20 95:12 130:3  
 150:4 170:3  
**relatively (6)** 62:1 90:14  
 143:24 165:10 169:18  
 171:21  
**release (1)** 66:8  
**released (2)** 53:24 54:7  
**relevance (3)** 69:16  
 168:15,17  
**relevant (17)** 1:14 17:25  
 18:5 25:17 31:22 53:14  
 69:9,20 74:5 76:11 85:17  
 86:8 124:15 126:4,6  
 167:24 184:7  
**reliable (1)** 79:15  
**reliance (1)** 17:12  
**reliant (2)** 42:4 184:25  
**rely (1)** 23:4  
**relying (3)** 37:19 60:24  
 105:24  
**remain (1)** 100:14  
**remainder (1)** 191:23  
**remains (1)** 141:3  
**remember (4)** 46:9 77:22  
 108:25 148:16  
**remind (4)** 53:23 54:13,16  
 149:23  
**remove (4)** 87:15,15,16  
 179:23  
**removed (3)** 20:19 87:11,13  
**removing (1)** 188:17  
**renegotiate (5)** 139:15,16  
 140:3,19,23  
**renegotiated (2)** 139:19,21  
**renegotiation (4)** 138:19,25  
 140:21 141:22  
**renegotiations (3)** 141:11,14  
 142:12  
**renewed (1)** 139:21  
**rent (20)** 31:24  
 32:2,21,21,23 33:3,10  
 114:21,21 116:22,22,24  
 117:8 120:24 121:1 122:6

153:12 168:2,6,13  
**rents (7)** 118:25 120:4,5  
 121:10 163:24 167:6  
 175:10  
**reopen (1)** 140:11  
**repeated (1)** 98:16  
**replicability (1)** 174:23  
**replicated (1)** 174:24  
**replied (1)** 174:24  
**report (32)** 9:15 17:6 40:7  
 47:17 48:8 50:10 56:20,24  
 59:11,16 60:7,12 69:8 70:4  
 83:11 85:11,20 91:20  
 95:14 103:3 104:7 134:18  
 135:4 146:20 147:24  
 149:21 152:12 154:21  
 175:13 177:18 178:15  
 187:23  
**reporting (1)** 169:22  
**reports (13)** 9:11,21 10:1,23  
 12:18 13:16 15:16  
 16:11,13 22:1,2 36:20  
 91:20  
**represent (4)** 88:8 102:3  
 124:19 155:14  
**representative (5)** 6:4 13:10  
 172:3 178:24 190:19  
**representatives (9)** 32:20,22  
 85:6,22 114:11 148:21  
 149:6 168:12 177:16  
**represents (1)** 154:12  
**reputation (6)** 98:8  
 100:21,22,24 101:9 112:22  
**reputational (1)** 153:6  
**require (1)** 168:16  
**required (2)** 5:2 181:5  
**requirements (8)** 20:3 27:14  
 143:25 145:5,13 150:21,22  
 160:20  
**requires (2)** 158:23,24  
**resigned (1)** 42:6  
**resources (2)** 53:1,1  
**respect (13)** 5:19  
 7:4,8,21,22,23 8:6 99:15  
 118:17 127:23 146:23  
 187:14 188:6  
**respective (1)** 170:7  
**respectively (3)** 22:4 57:14  
 83:12  
**respects (1)** 27:22  
**respond (2)** 51:19 139:9  
**responded (2)** 32:11 70:1  
**responding (2)** 43:9 120:1  
**response (18)** 7:10 35:15,25  
 45:13 46:13 47:13 82:3,4  
 119:7 120:10,17  
 121:2,6,7,21,23 125:8  
 173:24  
**responses (1)** 10:15  
**rest (1)** 9:12  
**restrain (1)** 33:7  
**restricted (1)** 148:11  
**restricting (3)** 147:18  
 179:17,17  
**restrictions (2)** 82:20 187:14  
**result (4)** 24:10 74:25 87:22  
 88:4  
**resworn (1)** 54:9  
**retain (2)** 20:13 101:2  
**return (2)** 54:8 94:13  
**revenue (7)** 74:2 86:6,20  
 91:7 101:21,22 168:23  
**reverse (1)** 132:8  
**revise (1)** 140:24  
**rid (1)** 170:4  
**riding (1)** 179:23  
**ridyard (235)** 10:3 12:12,23  
 14:2 15:10 16:25 17:14  
 18:1 19:16 20:20 21:14  
 22:8,11 23:25 24:23  
 28:6,7,21,23 29:1,24 31:3  
 32:14 33:1,12 35:23 36:13  
 37:5 38:4,11,17,24 39:19  
 40:1,19,25 44:5 45:5,10  
 47:11,21 49:9 50:17  
 51:13,19 52:1,9,12 55:7

56:6,12,23 57:1,15 58:3  
 59:6,9,17,19,22 60:4,9,12  
 61:16 63:3,16 64:6 66:1  
 67:3,12,21 68:5,14,20  
 69:4,12 70:5,7,10,23  
 71:1,20 72:8,10,21 74:6  
 76:13,20 77:2 78:4,11,24  
 79:6,8 81:1,9,15 82:4  
 83:14,20 85:4,13,20  
 87:7,14,24 89:7,14,25  
 90:6 10 91:15 92:11,21  
 93:8 94:3,6,8,18 95:1,3,18  
 96:4,16 98:2 99:5,10  
 100:16 102:12,20  
 103:20,24 104:2 105:21  
 106:11,14,16 107:2  
 108:17,23 110:2,19  
 111:12,21,25 112:9,20  
 113:8,18 114:1,5,16,25  
 119:7 120:8 122:18  
 123:2,11,23 125:10 126:13  
 127:13,15 128:4,25  
 129:5,13,21,24 131:16,18  
 133:13,24 135:7 137:4  
 138:16 139:5,11 140:9,16  
 141:19,23 143:19  
 144:7,11,18,22 146:5,8  
 147:9,13,24 148:2,18  
 149:2,5,19,23,25 150:15  
 151:6 153:2,14 154:24  
 155:24 157:10,23 159:3,6  
 160:8,18,25 161:14,21  
 162:17,23 163:17,19 169:5  
 170:5 172:5,8,19 174:3  
 175:12,22 177:3,14,23  
 178:8,20 179:22 183:19  
 188:15 189:15  
**righthand (1)** 70:6  
**rightly (1)** 74:10  
**rights (2)** 2:24 3:17  
**rigorous (1)** 18:25  
**rise (4)** 39:9 71:23 94:24  
 190:3  
**rising (1)** 189:24  
**risk (5)** 13:3 130:12  
 171:13,15,23  
**rival (6)** 32:9 98:2,10 110:9  
 179:15 188:21  
**rivals (2)** 122:14,20  
**rn9 (1)** 151:7  
**robin (3)** 9:7 119:25 193:2  
**robustness (2)** 17:12 127:23  
**role (3)** 55:13 150:8 159:19  
**roll (3)** 97:23 99:5 130:5  
**rolled (2)** 98:2,3  
**room (2)** 135:14 190:17  
**roughly (1)** 21:11  
**round (8)** 22:24,25 56:10  
 59:1 72:14 98:24 99:1  
 112:7  
**route (4)** 184:9,11 186:18,21  
**royalties (12)** 12:11 13:12  
 15:17 17:11 119:2 120:3  
 146:15 154:9 158:22  
 178:2,6,10  
**royalty (35)** 2:24 14:18 33:11  
 113:24 114:15,23  
 119:13,24 122:15 131:24  
 133:15,18 134:17 135:1  
 140:11,22,24 144:10  
 146:19 147:6,7 151:2  
 152:25 153:5 154:15  
 155:16 171:1 173:8,10  
 180:24 184:2 186:3,4,7,8  
 188:2  
**rtl (20)** 177:12  
 178:8,17,21,25 179:14  
 180:3,5 182:24  
 183:9,10,11 184:7  
 185:11,21 186:8,10,12,23  
 189:2  
**rules (1)** 8:10  
**ruling (1)** 24:5  
**run (3)** 48:25 151:24 174:6  
**rung (1)** 72:5  
**runs (1)** 5:17  
**ruthless (3)** 163:17,18,22

**S**

**s20 (1)** 62:7  
**sacrifice (1)** 162:9  
**sale (1)** 151:16  
**sales (22)** 39:7 40:14,15  
 43:17,18 52:22,24 84:12  
 96:9,14 97:25 102:3  
 109:18 151:16,18 152:3  
 153:21 154:13,13 155:15  
 159:24 187:18  
**salt (1)** 77:20  
**same (52)** 5:16,16,16 6:8  
 17:25 20:5,7 21:7  
 23:4,10,24 25:22 30:3  
 34:7,12,24 36:22 47:23,25  
 50:23 51:1 52:6 53:7  
 68:10,22,22 69:2 71:16  
 74:16 77:15 79:6 81:9

secure (2) 164:1,4  
 secured (1) 134:16  
 security (1) 127:5  
 see (61) 2:7 11:17 14:18  
 25:12 29:15 34:17  
 38:5,9,10,15 44:18 46:4  
 47:3 56:4,21 57:2 58:15  
 60:14,15 62:2 63:1 70:1  
 82:9,16,16 83:14,15  
 84:8,9,13 87:17 88:6 91:22  
 96:16 100:5 101:21 102:8  
 103:23 104:12,20  
 107:24,25 108:1,3  
 127:2,19 129:2 134:20,23  
 140:19 148:4 150:15  
 157:25 163:7 164:25  
 167:20 172:12 176:25  
 179:4 190:20 192:5  
 seek (5) 59:4 113:23 125:22  
 141:22 142:5  
 seeking (3) 7:3 39:6 184:16  
 seek (3) 30:3 64:19 83:4  
 seemingly (1) 106:4  
 seems (14) 5:13 6:9 18:24  
 24:21 71:7 77:8 96:17  
 142:2 152:22 158:15 159:1  
 175:6,8 177:23  
 seen (10) 30:2,18 37:23  
 52:18 95:8 102:1,3,16  
 104:15 149:21  
 segment (8) 103:7,15 107:4  
 149:14 159:11,14,16,21  
 selected (1) 25:9  
 selfcorrecting (1) 118:2  
 selfimposed (1) 75:23  
 selfrestrained (1) 36:4  
 selfsupplier (1) 106:1  
 selfsupply (24) 17:20,23  
 18:4,7,10,24 19:3,4,5,9,17  
 24:11,13 26:2 105:5,14  
 108:16 122:24 123:3 124:2  
 125:3 169:20,23 170:2  
 selfsupplying (1) 170:23  
 sell (34) 2:25 3:14,18 4:4,11  
 34:12,13 39:20 43:6,7  
 44:15 46:7,16,16 47:18  
 49:14 51:16 58:21,24 59:3  
 65:13,14 75:15 76:4  
 126:21,22 127:10 154:18  
 158:10 177:25 179:11  
 183:14 186:5,7  
 sellers (1) 80:20  
 selling (17) 39:21  
 41:22,23,24 42:6,25,25  
 43:1 44:9 45:2,6 49:1,11  
 151:13 171:19 184:24  
 186:6  
 sells (9) 34:25 35:4 42:15,15  
 65:14 76:4 108:7 124:20  
 126:23  
 semiconductor (1) 99:19  
 send (1) 130:14  
 sends (2) 31:21 55:18  
 sense (94) 13:13,20 15:8  
 20:25 23:1 28:16,19 29:13  
 31:23 32:13 34:1  
 38:13,13,14,18,21  
 39:24,25 41:6 48:17 52:10  
 55:16 56:2 58:7,14,25  
 61:19 62:18 63:18,20  
 65:24 68:17 75:2 87:2  
 89:7,18 97:7,15 99:6,7  
 103:11 105:12 106:8  
 110:10,13 112:8  
 115:7,12,18 116:18,19  
 117:10 118:15 119:11  
 122:1 126:16 127:7 130:6  
 132:11,16 142:23 143:1  
 145:11,19 149:14,18 153:9  
 156:19 159:22 160:5,15  
 161:3 163:18,19  
 168:3,4,10 170:3 172:15  
 176:2,4 179:16 180:21  
 181:7 182:19 183:8  
 184:6,8,22 186:16,18,20  
 187:12,17

sensitivity (1) 17:5  
 sent (1) 9:16  
 sep (12) 115:14,24 116:10,24  
 117:5 118:13 121:7 126:2  
 152:8,17 172:25 175:20  
 separate (11) 5:1 31:22  
 34:21 35:8 48:3 55:16,19  
 56:16 67:10,17 71:16  
 separately (1) 69:5  
 separation (1) 45:16  
 seps (16) 2:12 7:8 8:6  
 115:11,20  
 126:5,10,13,17,22  
 127:5,14 131:24 132:1  
 175:24 180:24  
 sequencing (1) 18:4  
 series (1) 149:11  
 serious (2) 161:20 175:24  
 seriously (1) 97:20  
 serve (2) 80:17,22  
 service (2) 151:1,23  
 services (1) 111:5  
 serving (1) 154:1  
 session (2) 10:4 54:20  
 set (10) 9:23 13:11 65:12  
 113:15,22 119:17 139:3  
 157:7 185:12,12  
 setting (2) 8:14 181:2  
 several (3) 126:6 136:23  
 191:10  
 shall (2) 58:24 96:19  
 shape (1) 83:3  
 share (51) 18:2 19:11  
 78:16,25 80:1,23 81:19  
 82:17 83:16,18,22  
 84:1,11,20,24 85:6  
 86:11,18 87:20,21  
 88:1,10,21 96:25 97:1  
 100:1,2,4,10 101:5,6 109:7  
 113:4 115:24 145:25  
 146:2,22,23 147:22,22  
 148:6,6 150:13 151:15  
 159:11,18 160:3,5 161:19  
 187:19 189:4  
 shared (1) 119:14  
 shareholders (3) 86:19,20  
 163:25  
 shares (43) 17:18 18:7 19:13  
 73:25 74:2 78:14,21,23  
 79:10,12,14,22 80:9,12,13  
 81:20 82:7,8 84:13,16,18  
 85:3 86:6,7,24 87:11 88:3  
 89:9,18,23,24 90:1,3,12  
 104:4 125:8 137:8  
 148:4,15,22 149:7,18  
 165:9  
 sheer (1) 128:3  
 shielding (1) 120:25  
 shock (1) 39:8  
 shop (3) 42:5,10 44:19  
 short (7) 7:5 55:5 136:24  
 143:17 171:22 174:6  
 shortcircuiting (1) 103:25  
 shorthand (1) 28:9  
 shortly (2) 3:22 135:19  
 shortrun (1) 34:2  
 shortterm (1) 31:24  
 should (33) 6:5 9:15,19  
 11:19 12:6 13:2 18:12,15  
 21:19 54:19 55:2 73:4 74:1  
 81:18,19,19 82:6,9 91:23  
 103:18 104:9 124:6,10  
 128:9,18 135:25 137:18  
 155:4,7 159:8 170:17  
 182:23 183:4  
 show (3) 29:4 36:5 68:1  
 showed (2) 59:11 69:23  
 shows (4) 50:11 60:19 104:7  
 106:11  
 shuffled (1) 190:12  
 side (10) 20:20 70:6 72:8,9  
 97:10 102:1 127:10 135:14  
 170:6 190:17  
 sidebyside (3) 44:9 50:22  
 96:23  
 sides (5) 24:23 78:24 127:9

129:15 173:22  
 sidestep (1) 133:23  
 sign (1) 48:20  
 signal (13) 31:21 55:18  
 106:6 109:11 118:25  
 130:14 144:8,11,12,14  
 159:12 183:13 187:12  
 signals (2) 47:19 95:8  
 signatures (1) 9:11  
 signed (1) 11:8  
 significance (1) 8:5  
 significant (27) 27:21 30:23  
 36:25 37:11 46:2,11,15  
 81:23 88:9 96:9,13 101:1  
 103:1 124:19 125:21 128:2  
 137:10 142:19 125 145:14  
 152:20 154:8 157:21  
 159:23 161:19 163:5 165:1  
 168:23  
 significantly (8) 26:5 82:3  
 84:17 96:13 113:15 142:7  
 154:9 158:20  
 silos (1) 52:20  
 similar (19) 23:24  
 29:8,12,16,16 35:4 45:6  
 50:23 52:7 57:17 58:12  
 60:5,12 64:11 68:18  
 76:17 88:24 138:14  
 simpler (2) 184:10 186:16  
 simultaneously (3) 50:1  
 65:15 114:22  
 since (1) 23:10  
 single (1) 65:6  
 singlemode (1) 4:11  
 singlesource (2) 156:24  
 157:17  
 singlesourcing (1) 157:13  
 sinking (3) 95:12,22 96:6  
 sir (3) 43:22 60:11 172:22  
 sit (4) 135:21,25 166:8,16  
 sitting (4) 50:22 96:19,22  
 136:14  
 situation (11) 45:15 49:25  
 88:3 120:12 160:25 162:15  
 169:8 181:15 182:1  
 184:4,19  
 situations (2) 137:15 141:9  
 six (2) 145:6 170:12  
 size (7) 106:6 115:9 125:15  
 128:3 132:17 155:16  
 161:12  
 sizes (1) 98:1  
 sizes (3) 65:10 94:21,22  
 skeleton (1) 187:24  
 skulls (1) 98:24  
 sleeves (1) 130:5  
 slightly (7) 8:12 27:2 64:19  
 65:11 111:12 132:19 160:1  
 slot (10) 25:8,10,11,19,20,21  
 26:4 27:7 157:20,21  
 slots (10) 25:6  
 26:12,14,17,22,23  
 27:20,22 38:2 79:24  
 small (16) 13:2 30:15 36:25  
 40:9,10 41:15 46:12 65:16  
 66:9 97:25 150:9,14  
 155:1,5 161:17 165:11  
 smaller (1) 102:16  
 smartphones (1) 65:24  
 snapdragon (1) 21:8  
 snippets (1) 129:22  
 soc (1) 23:10  
 socalled (1) 19:23  
 sold (8) 2:8 27:1 33:24 45:1  
 58:22 153:4 155:9 187:9  
 solicitors (3) 54:2,9 190:23  
 solve (1) 106:23  
 solved (1) 90:22  
 somebody (14) 30:25 75:18  
 77:21 80:5 84:22 88:1  
 100:3 107:16 110:25 150:6  
 166:15 168:20,20 174:24  
 somehow (1) 39:14  
 someone (14) 5:13 32:8  
 63:15 71:21 81:2 86:1  
 91:11 98:9,10 106:21

115:13 117:18 145:3  
 something (38) 1:18 4:7  
 6:13 14:3 26:11,16 29:22  
 30:17 35:25 41:5 74:1  
 89:14,19 91:12 95:7 96:7  
 103:17 106:5,18 131:19  
 138:14 139:7 145:4 156:13  
 160:21 161:21 171:2,18  
 172:4 173:23,25 176:1,10  
 179:20 180:6,15,22 187:5  
 sometimes (5) 10:8 30:3  
 43:5 65:15 125:3  
 somewhat (10) 27:23 35:3  
 46:8 112:3 113:9 114:7  
 147:7 148:19 156:3 158:14  
 somewhere (3) 36:3 81:3  
 168:13  
 sony (1) 89:3  
 soon (3) 148:5 165:6 166:15  
 sooner (1) 66:8  
 sort (35) 15:21 19:20 20:25  
 23:23 60:22 62:12 63:10  
 64:13 65:11 68:6,10 69:23  
 70:13 71:8,17 73:3 82:24  
 85:15 91:16 98:11 103:11  
 104:17 118:11 119:22  
 124:5 125:24 126:7,12  
 137:21 143:24 147:9 158:2  
 160:12 169:24 186:22  
 sorts (3) 29:16,16 65:7  
 sought (2) 177:21 182:3  
 sounds (2) 31:3 173:17  
 source (1) 125:24  
 sources (2) 125:11 130:7  
 space (1) 104:20  
 spaces (1) 100:11  
 speak (1) 73:12  
 speaking (1) 27:6  
 specific (13) 19:22 23:19  
 51:22 54:14 59:19 74:6  
 81:17 95:11,21 115:14  
 136:8,6 162:18  
 specifically (1) 79:18  
 specification (1) 75:23  
 specifications (1) 27:3  
 specifics (2) 73:1 142:14  
 spectrum (1) 26:16  
 speculation (1) 172:13  
 speed (1) 169:17  
 spend (3) 43:8 52:24,25  
 spike (5) 69:23 70:6,17,20,24  
 sponsor (9) 101:24 102:8  
 109:13,16 110:8 119:3  
 120:5,15 121:25  
 sponsored (1) 102:4  
 sponsoring (6) 110:2,8,16  
 119:23 121:25 122:13  
 spreadsheet (1) 69:2  
 spreadsheets (1) 69:1  
 snnip (14) 11:8 13:1 29:1,9  
 35:10,10,11 39:8 40:16  
 41:2,14 55:14 57:16 69:18  
 stable (1) 88:3  
 stack (1) 74:14  
 staff (1) 137:3  
 stage (1) 62:19  
 stages (1) 73:21  
 stance (1) 105:10  
 standalone (2) 177:17,22  
 standard (9) 3:20 34:10 62:1  
 64:20 65:2 113:3 115:14  
 148:12 164:11  
 standards (10) 3:6,8,23  
 29:16 66:4 98:20 99:4  
 112:7,15 113:2  
 start (20) 11:23 12:3 13:2,13  
 23:2,22 25:15 38:25  
 54:14,17,22 71:8 73:4  
 91:21 110:14 128:19  
 181:17 189:16 191:14,25  
 started (4) 45:14 88:16  
 98:24 109:7  
 starting (4) 13:3 18:16 66:19  
 73:8  
 starts (1) 148:6  
 stated (2) 137:7 162:14

statement (9) 19:13 23:6  
 40:6 77:21 79:5,13 126:16  
 135:4 162:19  
 statements (4) 100:16  
 130:10 140:10 152:23  
 states (1) 51:1  
 statutory (2) 115:11,18  
 steering (1) 91:6  
 step (2) 30:9 145:9  
 stepping (1) 23:2  
 steps (2) 132:6 171:10  
 stick (7) 47:20 139:3  
 161:2,3,9 190:19 191:22  
 stickiness (3) 47:20 50:13,14  
 sticks (1) 161:13  
 still (21) 23:23 35:4 50:14  
 66:22 74:25 76:23 86:21  
 118:7,10 147:2 149:12  
 150:22,22,24 161:5 169:21  
 183:25 184:2 188:22  
 189:20 191:16  
 stock (3) 44:3 93:25 94:1  
 stop (7) 12:23 32:15 94:13  
 122:5 124:16 182:25 185:2  
 stopped (2) 17:8 41:3  
 stopping (1) 181:24  
 stops (1) 36:8  
 story (4) 36:10 108:1  
 177:7,10  
 straightforward (1) 150:16  
 stranded (1) 95:24  
 strategy (4) 48:13 103:13  
 119:17 157:15  
 straying (1) 54:23  
 stress (1) 50:21  
 strictly (2) 45:16 90:8  
 strict (1) 27:6  
 strikes (1) 48:13  
 strong (5) 116:10 138:2  
 152:24 156:18,22  
 stronger (3) 35:2 44:23  
 117:21  
 strongest (1) 28:12  
 strongly (1) 32:12  
 structure (1) 113:1  
 study (2) 62:11 67:24  
 subject (3) 88:5 181:19  
 184:14  
 subjective (1) 8:13  
 subscribe (1) 117:13  
 substantial (2) 55:21 56:4  
 substantially (2) 64:1 82:14  
 substantive (1) 67:25  
 substitutability (2) 48:1,2  
 substitutable (2) 63:1,21  
 substitute (3) 46:4 48:10  
 145:23  
 substitutes (3) 38:9 74:17  
 75:22  
 substituting (2) 46:6 162:9  
 substitution (45) 20:7 23:3,8  
 24:3,8 31:15,17 37:21  
 40:11 41:1  
 45:3,7,9,12,17,20,25 51:14  
 53:17,19 56:19 57:2 61:9  
 66:7 69:11 72:4,7,15,16  
 74:20,23,25 75:7,8  
 76:16,18,19  
 77:2,16,17,19,23 78:1 85:2  
 107:10  
 subtopic (3) 78:13 91:16  
 124:1  
 success (5) 98:22  
 100:12,13,18,19  
 successful (5) 88:19 99:7  
 108:1 131:5,6  
 suddenly (2) 76:8,23  
 suffered (1) 153:7  
 sufficient (4) 23:3 72:4 99:21  
 119:1  
 sufficiently (3) 39:17 40:13  
 97:17  
 suggest (5) 55:24 61:6 62:22  
 67:12 91:7  
 suggested (2) 7:25 8:19  
 suggesting (2) 49:9 186:11

suggestion (2) 25:7 131:22  
 suggests (7) 30:18 37:23  
 45:19 69:10 99:22 112:23  
 180:13  
 suite (1) 53:3  
 summary (1) 78:15  
 sun (1) 101:3  
 sunday (2) 191:4,6  
 sunk (7) 92:7,23 93:3,21  
 95:10 98:19 103:1  
 sunkness (3) 92:23 93:14  
 115:10  
 supplied (2) 20:1 141:7  
 supplier (12) 75:13,14,18  
 109:19 110:11 125:20  
 145:5 160:20,21 161:1  
 181:25 188:19  
 suppliers (7) 25:9 72:20  
 145:6 157:4,5 159:15  
 178:23  
 supplies (2) 150:23 189:11  
 supply (35) 2:17 3:14 11:7  
 26:4 60:8 72:21 107:10  
 131:24  
 140:4,12,16,18,22,25  
 141:1,2 147:3 150:20  
 153:16 154:5 155:8  
 170:13,24 171:11,12  
 175:18 179:17 181:11  
 184:3,15,18 185:4,25  
 187:11 188:20  
 supplying (4) 124:22 169:21  
 187:11 188:22  
 supplyside (13) 20:7 23:3,8  
 24:3,7 72:14,16 76:16,19  
 77:2,16,19,23  
 support (4) 37:18 67:16,17  
 92:13  
 supports (1) 135:3  
 suppose (8) 37:10 93:18  
 118:19,22 153:25 154:10  
 175:22 177:14  
 sure (18) 10:5,13 11:24  
 90:18 109:25 116:25  
 129:25 134:17 135:13  
 139:11 164:15 169:16  
 171:24 172:14 175:5 176:5  
 177:10 178:10  
 surely (1) 76:20  
 surmount (1) 32:8  
 surmountable (1) 32:6  
 surprise (1) 188:14  
 surprised (2) 79:16 162:24  
 surprising (1) 57:9  
 surprisingly (1) 99:17  
 surrender (1) 162:5  
 survive (1) 186:2  
 suspect (1) 189:11  
 sustain (2) 107:14 148:13  
 sustained (1) 148:13  
 sweat (2) 184:22 185:25  
 sweater (2) 44:20,21  
 sweaters (4) 41:24  
 42:6,10,10  
 switch (13) 10:9 39:14 42:4  
 44:20,22 49:24 61:15  
 74:8,13 125:21 128:16  
 129:8 156:2  
 switched (2) 59:13 75:25  
 switches (3) 63:6,6,7  
 switching (3) 67:17 88:6  
 132:18  
 sworn (5) 9:5,7,8 193:2,3  
 symmetric (2) 170:18 171:24  
 synonymously (1) 112:3  
 system (3) 21:8 39:9 67:5  
 systems (1) 167:8  
 T  
 t (5) 93:19,19,19,24,24  
 table (6) 56:20,24 61:3 85:6  
 86:10 148:21  
 tables (2) 86:23 148:22  
 tack (1) 6:15  
 tail (1) 65:17  
 tailor (1) 131:14

tainted (1) 31:14  
 taken (10) 11:13 32:1 71:13  
 77:20 97:20 100:4 155:25  
 171:9 175:19 177:4  
 takes (9) 6:4 70:20 78:5  
 106:14,18,20 107:3 110:12  
 117:16,20  
 taking (8) 31:23 104:9  
 116:22 137:11 147:2 160:4  
 165:21 168:13  
 talk (20) 17:1 36:23 54:2  
 62:10 71:3 72:17 73:25  
 77:18 103:16 109:13 112:2  
 124:7 132:9 135:14 151:7  
 155:8,8 175:14 179:20  
 189:13  
 talked (3) 69:15 115:5  
 187:22  
 talking (35) 16:15 22:3  
 28:10,11 30:21 38:12 39:2  
 51:2,15 56:21 64:3 68:20  
 77:11 80:19 81:5 88:16  
 92:2 94:18 101:24 105:21  
 127:25 133:25 138:7  
 139:25 150:16,18  
 151:8,9,11 153:15,17,18  
 175:7 188:16,17  
 talks (2) 92:25 154:21  
 targets (1) 44:2  
 task (1) 21:15  
 teach (1) 43:23  
 team (2) 54:3,4  
 tear (1) 142:12  
 tease (1) 121:19  
 technical (5) 20:8 32:6  
 106:23 126:18 128:12  
 technology (9) 62:21 95:9,21  
 98:25 99:2 115:9 142:6  
 166:8,10  
 telecom (1) 28:23  
 telegraphed (1) 6:9  
 telling (6) 30:17 34:20 83:23  
 84:20,21 168:22  
 90:18 109:25 116:25  
 129:25 134:17 135:13  
 139:11 164:15 169:16  
 171:24 172:14 175:5 176:5  
 177:10 178:10  
 tends (7) 33:18,18 65:13  
 66:3,13,16 134:7  
 tenminute (3) 136:1,10  
 143:15  
 tens (1) 151:17  
 tension (1) 140:9  
 term (9) 158:3 166:11  
 167:19 174:8  
 180:8,13,17,21 182:7  
 terms (34) 9:20 13:15 14:2  
 15:17 17:9,16 18:2,22  
 27:25 28:1,9 31:7 42:16  
 47:20 50:15 60:25 96:24  
 100:23 101:13,21 127:18  
 133:2 134:4 143:12 148:4  
 154:14,14 155:1 157:1

14:14 15.9,13 16.4 6 21:24  
 22:20 32:24 36:1,2  
 114:9,11,24 116:15 123:10  
 132:8 134:20 142:18  
 153:20 172:24 173:15  
 174:9 175:9 180:23,25  
 182:21 186:10 188:18  
**therapeutic (1)** 166:6  
**thereby (1)** 120:24  
**therefore (37)** 4:2 13:13,13  
 15:1 32:2,24 39:21 41:2,2  
 60:23 62:18,24,24,25  
 65:1,17 67:7 81:10 83:2  
 91:13 95:11,22,22 96:10  
 99:16 101:4,18 102:5  
 118:3 122:15 138:3 151:15  
 161:14 170:13 178:3  
 186:3,20  
**theres (1)** 149:15  
**thick (4)** 20:3,16,18 21:9  
**thin (7)** 19:24  
 20:3,5,11,16,18 23:10  
**thing (24)** 27:12 43:23 59:10  
 60:21 69:7 72:6 73:19  
 76:20 82:15 96:8 98:11  
 99:13 111:17 117:7 123:4  
 132:10 133:8 146:1 147:4  
 157:11 170:10 178:25  
 181:17 188:7  
**thinking (15)** 26:10 74:4  
 96:19 124:3 133:13,14  
 135:25 142:21,23 144:9  
 147:18 152:1 170:12  
 191:6,8  
**thinks (5)** 51:20 52:13 62:14  
 120:23 137:18  
**third (4)** 17:6 30:10 98:15  
 135:4  
**thirdparty (1)** 102:13  
**though (12)** 27:15 46:23  
 57:18 89:7 100:17 106:1,8  
 125:4 138:1 163:17 170:8  
 177:23  
**thought (13)** 54:18 59:10  
 67:12 78:25 89:25 111:14  
 120:8 131:19 135:24  
 167:20 173:20 190:3 192:2  
**threat (7)** 121:12 124:21  
 154:4,6,6 159:1 186:25  
**threaten (2)** 125:20 128:7  
**threatening (1)** 129:7  
**threats (3)** 129:19 130:16  
 176:18  
**three (5)** 50:2 109:3 131:2  
 178:16,19  
**threshold (4)** 63:10,13  
 97:18,19  
**throw (1)** 69:24  
**through (40)** 3:20 5:20  
 9:10,20 10:4,6,14 36:24  
 37:8 43:2 45:17 48:24  
 51:21 52:14 71:4 94:2,9  
 102:13 105:14,23 111:11  
 115:2 118:23 119:11  
 120:11 121:11 124:2  
 125:2,3 130:15,19  
 136:1,2,5 146:25 147:4  
 178:19 184:23 188:20,21  
**throughout (1)** 47:19  
**throw (1)** 107:19  
**thursday (1)** 192:9  
**thye (1)** 134:15  
**tick (1)** 143:3  
**tier (4)** 62:15 157:5  
 169:24,25  
**tiers (3)** 62:13 65:9 157:6  
**tim (1)** 43:23  
**time (84)** 6:8 16:17 22:3  
 30:20 33:18,19,23 34:12  
 35:19 46:11 47:6 54:1  
 56:18 57:5,9 60:25 65:9  
 66:19 69:21 70:19 71:7,7  
 76:3 77:4,10,11 79:23  
 82:19 88:3 89:6 94:2,12  
 98:7,18 100:1,2 101:6  
 103:9 104:4,25

106:3,14,19,24 107:12,15  
 109:1,3 111:11 112:13,15  
 128:21,24 129:15 130:10  
 131:7 136:2 137:9,10  
 138:3,7,8 139:6  
 145:6,13,15 146:14,25  
 147:20 148:4,14,23  
 150:10,11 151:3 163:21  
 164:8,9 166:19 170:12,12  
 175:24 189:15 191:15,24  
**times (8)** 26:2 72:15  
 82:17,17,22 136:23 149:22  
 156:24  
**timetable (8)** 135:18  
 136:7,16 137:1 190:14  
 191:14,17,23  
**timing (6)** 61:4 66:18 67:1  
 135:11,11 170:5  
**today (10)** 76:4 100:13,18  
 103:10 107:19 135:22,25  
 136:14 170:22 190:10  
**toes (1)** 101:18  
**together (1)** 129:21  
**told (2)** 110:14 186:12  
**tomorrow (14)** 96:20 123:22  
 135:13,18,20 136:4,5,20  
 189:12,15,20,21 190:9  
 192:5  
**tony (1)** 49:4  
**too (10)** 12:1 13:3 36:4  
 70:16 93:12 114:14 122:2  
 170:6 171:1 180:23  
**took (2)** 100:10 171:9  
**tool (2)** 12:6 73:9  
**topic (15)** 10:7 11:1 50:18,20  
 78:12 125:14 135:9 137:4  
 162:20 172:19,21 174:5,15  
 189:12,17  
**topics (1)** 10:3  
**total (1)** 157:9  
**touch (1)** 138:18  
**touched (1)** 89:14  
**towards (3)** 34:1 57:19 158:7  
**town (2)** 29:4 145:11  
**trade (4)** 93:11 133:2 144:17  
 159:14  
**tradeoff (3)** 153:2,8 161:12  
**tradeoffs (1)** 145:24  
**trading (7)** 76:7 118:21  
 158:2 159:13,18 160:9  
 178:22  
**transacted (2)** 80:16,17  
**transcriber (1)** 137:3  
**transcript (3)** 1:15 6:1 54:25  
**transferring (1)** 150:9  
**transient (2)** 148:3,14  
**transition (10)** 49:19 55:20  
 57:4,19,22,23 60:15,16  
 62:2 64:17  
**translations (1)** 49:20  
**translating (1)** 135:2  
**tremendously (1)** 80:1  
**trend (1)** 84:14  
**tribunal (14)** 6:22 9:9,17,24  
 10:12,15 16:5,7 24:2 85:23  
 137:3 139:24 190:7 193:3  
**tricky (1)** 11:21  
**tried (2)** 65:7 76:1  
**triggers (1)** 3:9  
**trimmed (1)** 65:11  
**trouble (6)** 109:15,18 110:5  
 117:18,19 119:23  
**true (13)** 1:23 29:15 65:18  
 66:21 99:18 100:18 117:1  
 169:20 170:1 182:16,19,24  
 187:16  
**trust (1)** 108:23  
**truth (3)** 33:15 108:22 110:1  
**try (17)** 10:7 11:17 39:6,14  
 58:3 59:4 70:15 72:2  
 106:22 107:3 110:8,9  
 125:22 131:21 160:16  
 175:15 177:21  
**trying (14)** 12:4 19:8 23:19  
 24:17 44:18 87:20 110:15  
 117:7,14 120:14 121:19

150:6 151:17 179:23  
**tsmc (2)** 81:5,7  
**turn (1)** 68:6  
**turner (26)** 42:22 43:16  
 45:21 46:19 52:21  
 53:13,21 164:15,9,12,19  
 165:15 166:4 167:7  
 180:5,13 181:13  
 182:6,10,18 183:25 184:12  
 185:2 186:10 187:25  
**turning (1)** 178:14  
**turns (2)** 129:9 171:17  
**twice (1)** 114:21  
**twopage (1)** 149:6  
**type (2)** 26:6 151:24  
**types (3)** 23:9 28:11 49:12  
**typical (1)** 175:20  
**typically (7)** 30:22 99:25  
 101:8 107:11 109:20  
 152:20 166:20

---

**U**

---

**uk (1)** 43:8  
**ultimately (11)** 12:5 19:12  
 21:22 40:4 62:21,22 63:2  
 121:8 130:18 134:21 189:9  
**umts (47)** 3:4,20 25:1  
 29:7,12 30:5,6 34:7,11  
 35:17 37:9,14,19 38:1,7  
 39:5,10,21 42:15,18  
 43:4,5,8,14 44:9,25  
 47:5,15,24 48:12  
 49:1,18,21 50:12,22 53:12  
 57:17 68:10 71:14 87:1  
 98:21 149:1,14 150:9  
 153:25,25 154:1  
**umtscdma (3)** 28:8 36:21  
 55:10  
**unable (1)** 151:23  
**unattractive (2)** 39:18  
 188:22  
**unavoidable (6)** 158:2  
 159:13,18,23 160:6,9  
**uncertain (1)** 78:22  
**uncertainty (3)** 128:12,18  
 179:15  
**unconstrained (1)** 117:9  
**undeniable (1)** 105:2  
**undermine (3)** 119:17 183:1  
 185:23  
**undermining (1)** 119:11  
**understand (55)** 6:5 7:15  
 10:18,22 12:6 13:9 15:23  
 18:14 19:8 21:9,24 22:11  
 24:24 26:6 28:10,13 29:6  
 35:23 36:14 44:5 45:21  
 50:17 51:23 53:21 55:12  
 66:23 69:19 78:19 87:7  
 102:25 104:19 107:13  
 115:21 117:14,15 121:20  
 123:13 126:18 128:25  
 129:16 138:22 142:8  
 143:12 156:17 169:8,10  
 170:9 173:23,25 174:11,16  
 176:25 177:15 180:16  
 182:7  
**understandable (1)** 164:12  
**understanding (19)** 5:24  
 7:12,14 11:14 12:16 13:21  
 20:8,9,23 64:10 66:3 76:3  
 81:14 139:12,13 140:1  
 169:18,22 181:15  
**understood (4)** 6:1,22,24  
 68:25  
**undertakes (2)** 163:1,5  
**undertaking (2)** 99:1 106:7  
**undesirable (1)** 8:16  
**unduly (1)** 81:20  
**unfair (3)** 76:21 166:23  
 178:12  
**unfairly (1)** 182:11  
**unfortunate (1)** 111:4  
**unfortunately (1)** 100:3  
**unilateral (2)** 71:23 139:16  
**unique (1)** 27:21

**uniqueness (1)** 176:5  
**united (1)** 51:1  
**units (1)** 154:22  
**universal (1)** 126:19  
**unless (3)** 31:4 42:4 164:5  
**unlicensed (2)** 183:15 187:9  
**unlike (1)** 185:1  
**unlimited (2)** 80:18 153:10  
**unlocking (1)** 116:20  
**unnecessary (1)** 10:17  
**unpack (1)** 33:13  
**unprofitable (1)** 40:13  
**unproven (1)** 109:18  
**unquestionably (1)** 2:6  
**unshackle (2)** 116:16 117:5  
**until (9)** 53:24 54:4 65:22  
 136:1,2 149:11,18 171:4  
 192:8  
**unwilling (1)** 74:24  
**updating (1)** 139:4  
**upfront (1)** 134:12  
**upper (1)** 169:25  
**used (13)** 68:11,21 69:21  
 77:23 134:18 137:20  
 164:22 170:21 174:16  
 181:2 183:12 186:25  
 188:10  
**useful (23)** 11:11 30:17  
 36:17,19 48:10 59:10  
 61:17 67:21 68:5 81:15  
 82:8 83:14 95:13  
 123:23,25 131:20 138:5  
 142:17 155:24,25 158:4  
 177:4 178:19  
**usefully (1)** 71:3  
**users (1)** 22:14  
**uses (2)** 169:24 174:22  
**using (19)** 2:10 4:6 7:7 13:1  
 24:2,5 37:19 78:20 90:13  
 112:3 114:8 116:17 117:2  
 130:13 134:16,21 151:10  
 180:17 184:14  
**usual (1)** 4:10  
**utilise (1)** 174:11

---

**V**

---

**valid (5)** 21:18 22:16,19  
 87:14 115:15  
**valuable (1)** 151:18  
**value (13)** 44:4 80:9,16  
 86:14,15,21 89:16,18,24  
 90:5,20 93:25 94:1  
**variable (3)** 29:19 33:20 34:5  
**variants (1)** 27:1  
**variation (2)** 50:11 190:6  
**variations (1)** 167:8  
**varies (3)** 30:19 47:5 114:13  
**various (5)** 21:7 72:15 73:21  
 88:4 128:12  
**vary (6)** 25:23 33:18 49:13  
 159:25 160:22 161:1  
**venture (1)** 179:11  
**verizon (7)** 28:23 39:22  
 49:7,15,21,23 50:23  
**version (4)** 21:9 45:23 46:20  
 116:25  
**versions (2)** 30:6 165:5  
**versus (5)** 37:20 50:16 52:8  
 64:4 177:6  
**vertical (1)** 150:2  
**via (11)** 5:11 14:18 104:18  
 128:16 133:1 160:3  
 171:11,12 180:25 181:2  
 185:13  
**video (1)** 64:21  
**views (2)** 113:9 135:20  
**vigorously (1)** 62:7  
**virtually (1)** 52:9  
**virtue (2)** 128:2 134:21  
**visis (5)** 24:17 37:3,3 76:7  
 168:20  
**volume (22)** 24:10 27:21  
 46:7,8 74:2 80:9,11  
 86:7,15 89:16,23,23  
 90:1,21 125:21 134:13

150:10 151:16 152:16  
 156:20 159:24 161:17  
**volmerelated (1)** 23:17  
**volumes (16)** 27:25 35:20  
 80:15,16 81:7 82:2 90:4  
 124:19,24,25 145:14 150:7  
 151:3 154:16 158:12,22  
**voluntary (1)** 142:11

---

**W**

---

**waiting (2)** 85:13 106:9  
**wanting (3)** 127:1 164:14  
 190:19  
**wants (9)** 20:13 63:15,16  
 75:14,19,19 76:8 111:1  
 152:13  
**waste (1)** 138:3  
**way (58)** 2:21 6:23 10:16  
 16:23,24 20:24 22:24,25  
 33:24 38:3 42:13 44:11,24  
 52:12 58:8 59:1,9 62:21  
 63:12 67:10 68:24,25  
 72:14 73:6 79:1 83:3 86:9  
 91:6 93:18 95:19 103:2,6  
 105:13 116:3 117:2,5  
 118:20 121:2 122:7,20  
 127:4 132:2 134:11 138:12  
 142:8 144:20 147:15  
 156:10 166:23 167:23  
 175:7,25 180:21 181:8  
 183:7 184:10 186:6 188:21  
**ways (12)** 21:18 22:15 55:8  
 72:24 73:17,23 78:19  
 118:7 120:20 134:6 137:14  
 182:21  
**wayside (1)** 132:20  
**wcdma (1)** 28:19  
**wednesday (3)** 1:1 5:10  
 85:24  
**weekend (3)** 54:1 135:15  
 191:16  
**weeks (1)** 85:10  
**wellestablished (1)** 166:5  
**western (1)** 105:9  
**whatever (13)** 5:17 14:9  
 31:12,12 42:7 53:19 62:16  
 71:15 106:23 131:15 151:2  
 161:2 171:17  
**whatsoever (2)** 45:17 175:11  
**whenever (1)** 135:1  
**whereas (3)** 18:6 113:3 186:2  
**whereby (1)** 20:6  
**whichever (2)** 107:4 121:13  
**whinston (1)** 92:14  
**whistles (1)** 64:14  
**whoever (2)** 128:17 154:8  
**whole (15)** 10:12,15 13:16  
 15:7,7,8 22:20 52:14 53:3  
 88:24 105:8 111:17 142:25  
 147:10 181:4  
**wide (4)** 12:1 26:24 61:6  
 157:2  
**wider (2)** 65:19 156:9  
**williams (26)** 6:17,19 7:15,20  
 8:2,5,22 9:10,14,18,23  
 54:11 85:10 136:14 149:8  
 152:10 172:22  
 173:3,14,19,25  
 190:22,24,25 191:9,21  
**willig (1)** 93:13  
**willing (13)** 44:20,22 46:3,5  
 63:25 64:20 74:22,24  
 75:6,8 152:25 156:23  
 158:21  
**willingness (3)** 48:9 62:16  
 64:18  
**win (2)** 97:15 147:17  
**wind (1)** 173:12  
**window (1)** 106:24  
**windows (1)** 42:11  
**winning (1)** 109:7  
**wish (4)** 33:8 87:6 159:13  
 187:10  
**wishes (1)** 33:10  
**withdraw (5)** 39:12,16 41:10  
 154:11 171:21

**withdrawing (2)** 154:10,13  
**withdraws (1)** 154:9  
**withheld (1)** 171:18  
**withhold (4)** 147:14 154:4  
 171:17 172:1  
**withholding (1)** 150:19  
**witness (2)** 6:23 130:10  
**witnesses (1)** 54:14  
**wonder (3)** 60:9 85:5 162:25  
**wondered (2)** 69:24 94:11  
**wondering (2)** 135:17 188:16  
**work (18)** 1:22 2:21 14:5  
 15:9 32:25 40:18 52:13,17  
 57:17 69:1 70:11 133:13  
 135:18 136:12,13 170:16  
 185:7 187:19  
**worked (3)** 1:24 3:3 34:17  
**working (5)** 3:2 38:5 93:9  
 102:18 150:15  
**works (3)** 114:18 136:9  
 172:24  
**world (11)** 32:17 66:20 117:1  
 127:3 142:5 168:5  
 183:4,6,7 184:5 185:21  
**worlds (1)** 63:14  
**worried (1)** 81:18  
**worry (1)** 183:9  
**worse (2)** 4:12,12,13  
**worsens (1)** 41:5  
**worst (1)** 147:1  
**worth (3)** 138:4 157:1 178:14  
**worthwhile (3)** 96:10,14  
 97:12  
**wrestle (1)** 131:16  
**writes (1)** 187:7  
**writing (1)** 136:25  
**written (3)** 174:14 191:18  
 192:3  
**wrong (6)** 79:2 111:23  
 171:16,16 176:20 178:4

---

**X**

---

**x (3)** 46:15 80:14,14  
**x21 (1)** 149:8  
**x211 (2)** 85:25 86:2  
**x212 (1)** 86:4  
**x213 (2)** 86:5 149:10  
**x214 (1)** 149:9  
**x55m (3)** 21:4,10,11  
**xiaomi (2)** 34:23 35:1

---

**Y**

---

**year (12)** 64:25 65:7,15,16  
 107:16 130:20,21 131:1  
 141:15,15 148:5 151:18  
**yearbyyear (3)** 130:19 137:23  
 138:13  
**yearly (1)** 139:20  
**years (17)** 25:25 56:22 57:21  
 65:14 88:15,15,25 89:1  
 107:12 109:3,5 131:1,2  
 141:15 143:4 164:16  
 170:12  
**yellow (8)** 41:25  
 42:1,3,7,9,13 44:20 45:3  
**yesterday (5)** 1:12 43:21  
 100:13,19 190:11  
**yesterdays (1)** 1:6  
**yet (5)** 34:25 44:18 69:14  
 96:21 106:25  
**youre (1)** 186:14  
**yourself (5)** 107:17 109:15  
 116:16 122:12 123:5

---

**Z**

---

**zero (6)** 46:7 48:1,15 85:15  
 160:5 161:18  
**zeroone (2)** 101:4 112:21  
**zeros (1)** 156:7

---

**0**

---

**01 (4)** 154:11,12,13,18

---

**1**

**1 (13)** 56:20,24 58:25,25  
 59:3 61:3 93:19,20,24  
 155:11,12 182:22 193:2  
**10 (13)** 30:22 31:11  
 35:15,21,22 39:9 64:3  
 150:21 155:14 160:20,22  
 161:6,8  
**100 (22)** 65:22 85:15 86:14  
 87:5 115:24 130:25 144:24  
 145:12,24 146:2 148:22  
 149:16 151:2 154:1,5,7,11  
 155:11,12 159:11 171:14  
 183:18  
**100s (1)** 149:11  
**1030 (1)** 1:2  
**1258 (1)** 94:15  
**13 (1)** 59:16  
**141 (2)** 179:4,7  
**142 (1)** 179:18  
**15 (5)** 1:1 30:22 64:3 150:21  
 192:9  
**17 (1)** 108:7  
**190 (1)** 193:4  
**191 (1)** 56:25  
**1996 (1)** 92:15

---

**2**

---

**2 (2)** 93:24 94:13  
**20 (5)** 30:22

447 (1) 192:7  
 48 (1) 111:23  
 4g (24) 3:18 4:11 5:1,20,22  
 6:11 55:21,25  
 57:12,13,19,20 58:25  
 61:15 63:1 66:10 68:18,19  
 71:4 77:6 98:19 102:4,11  
 108:2  
 4genabled (1) 64:4

---

5

---

5 (9) 30:19 35:15,21 39:9  
 83:11 136:3 147:24,25  
 155:3  
 50 (3) 86:14 102:3 151:12  
 500 (2) 64:3 136:3  
 500000 (1) 59:3  
 54 (1) 149:24  
 5g (58) 1:21 2:12,18  
 3:22,23,24 4:7,12,23,25  
 5:15,17 7:7,7,8 8:6 21:6  
 25:11 36:3,7 55:22,25  
 57:6,7,13,19 58:25 61:7,15  
 62:18 63:1,10,14 64:11,13  
 66:8,19,20,21 68:19 69:24  
 71:4 90:13 98:19 100:1  
 105:4,21,23 106:5  
 108:3,3,19 112:18 129:6,8  
 169:8,12 170:8  
 5g4g (1) 4:15  
 5genabled (2) 2:5 64:4  
 5gonly (2) 4:4 70:22

---

6

---

6 (2) 83:11 98:3  
 60 (3) 56:24 57:1 62:16  
 600 (3) 40:10 64:3 151:14  
 612 (1) 175:17  
 66 (1) 87:3  
 67 (3) 86:15,21 87:3  
 6b (1) 175:13  
 6g (1) 5:17

---

7

---

70 (2) 160:23 161:1  
 700 (1) 151:14  
 75 (1) 83:12  
 76 (1) 83:12  
 78 (1) 148:2  
 7g (1) 5:17

---

8

---

80 (3) 56:4 96:25 160:23  
 800 (1) 151:14  
 805 (1) 154:22  
 865 (1) 21:8

---

9

---

9 (5) 191:19 192:4 193:2,3,3  
 930 (4) 136:4 189:21 192:5,8  
 999 (1) 12:18