IN THE COMPETITION APPEAL TRIBUNAL

Case No: 1284/5/7/18
1290/5/7/18

Salisbury Square House
8 Salisbury Square
London EC4Y 8AP

Wednesday 25 May 2022

Before:
The Honourable Mr Justice Michael Green
Derek Ridyard
Sir Iain McMillan CBE FRSE DL
(Sitting as a Tribunal in England and Wales)

BETWEEN:

Royal Mail Group Limited
BT Group PLC and Others v DAF Trucks Limited and Others **Claimants**

v

DAF Trucks Limited and Others **Defendants**

A P P E A R A N C E S

Tim Ward QC, Ben Lask and Cliodhna Kelleher (On behalf of RM/BT)
Daniel Beard QC, James Bourke and Daisy Mackersie (On behalf of DAF)

Wednesday, 25 May 2022

(10.35 am)

THE CHAIRMAN: Good morning.

MR BEARD: Good morning.

THE CHAIRMAN: So Mr Ward and Ms Kelleher are attending remotely.

MR BEARD: I understand that is the case. Although we cannot see them on screen, I am told that it has been tested.

THE CHAIRMAN: No, I think they are not turning their cameras on, and that is fine. I hope they are okay. Sorry to hear about their predicament, but we can continue.

Just as a matter of logistics, obviously the discussion will be led by us, in particular Mr Ridyard, but when we have the clarificatory cross-examination, is that going to be done by you, Mr Lask, or Mr Ward?

MR LASK: It is envisaged that Mr Ward will ask any clarificatory questions.

THE CHAIRMAN: Okay. All right.

Mr Ward, perhaps you could just confirm that we can hear you and you can hear us. There you are. Okay.

MR WARD: Yes.

THE CHAIRMAN: You can hear us?

MR WARD: Yes, thank you very much.

THE CHAIRMAN: We can just about hear you. Okay, great. You do not need to leave your camera on, but good to know you are there.

MR WARD: Thank you.

THE CHAIRMAN: Right, okay.

MR BEARD: I think the idea is that at the end of each of the sections, there will just be merely clarificatory questions, and then further cross-examination will be left until Friday I think is the plan.

THE CHAIRMAN: Exactly so. Right, and everyone is okay with the adjusted timetable?

MR BEARD: Yes, I think we have done what we could to try and accommodate as best possible and I am sure I speak for Royal Mail and BT that we are most grateful to the tribunal for the flexibility to try and accommodate these things.

MR LASK: Yes, absolutely. Yes, sir.

THE CHAIRMAN: So we are going to try to squeeze in complements in the last week of evidence?

MR BEARD: Yes, obviously there are bits of that last week of evidence where we are hoping things may go short in any event.

THE CHAIRMAN: Yes, okay.

MR BEARD: So people are working in the background on things like tax to see whether or not we can compress what is required on those issues. So that is --

THE CHAIRMAN: We can certainly start earlier and finish late in that week to make sure we do actually complete it all by the Wednesday.

MR BEARD: Yes. I am most grateful. What we have done is we have put the complements in before the tax because it is the same experts that are dealing with the two --

THE CHAIRMAN: Loss of volume.

MR BEARD: Exactly, and complements, so that it would just be effectively two sessions continuously. That is the overall intention.

THE CHAIRMAN: All right. That makes sense.

Right. So I think we will just swear in --

MR BEARD: I will leave Mr Lask to swear in Mr Harvey and then I will swear in Professor Neven.

THE CHAIRMAN: Right. Okay.

MR JAMES HARVEY (affirmed)

PROFESSOR DAMIEN NEVEN (affirmed)

THE CHAIRMAN: Thank you very much. I hope you have got enough space there and -- you are quite close together, but I think that is the idea of a hot tub!

MR HARVEY: That is okay. It is certainly warm.

THE CHAIRMAN: Nice and cosy, yes.

MR BEARD: Sir, the only issue is do you want the witnesses to be shown the relevant reports? Because, of course, we are dealing with different reports from the ones that we were dealing with the other day. I understand that Professor Neven has a couple of corrections, just on labelling for tables, so I do not know whether or not it is sensible to deal with those formalities, as it were.

THE CHAIRMAN: It is probably a good idea to get it out of the way. I do not think we need formally for them to confirm --

MR BEARD: The three reports.

THE CHAIRMAN: -- yes, the three reports, but those ...

Mr Harvey, you do not have any corrections to make to those?

MR HARVEY: No.

THE CHAIRMAN: No.

Why do you not just run through those corrections then?

MR BEARD: Yes.

Could we have bundle {E/35}, which is Professor Neven's second report in relation to overcharge. If we could just go to page 17 {E/35/17}.

I think, Professor Neven, you just wanted to clarify one matter in relation to the labelling at the bottom of the table; is that correct?

PROFESSOR NEVEN: Yes, I want to clarify that the exchange rate that is used in that table is not pounds per euro, but euro per pound.

MR BEARD: It is down in the notes I think -- yes, that is very helpfully -- it is essentially -- it says "MLO cost, DAF UK sales ..." and it says pounds to euros. I think, although it is probably obvious from the table itself, it should be euros to pounds.

THE CHAIRMAN: Okay.

MR BEARD: If we could go to page 83 {E/35/83}.

I think, Professor Neven, that you have highlighted the same issue arises in relation to the labelling of this table?

PROFESSOR NEVEN: Exactly. The exchange rate is defined in this table as euros per pound.

MR BEARD: If we could just go over the page to page 84 {E/35/84}.

This is a section where you are dealing with the before-during analysis, you can see that at A.19, but I think you have indicated, if we go to table 19 itself, which is the next page {E/35/85}, I think there is a correction in relation to the title of that table?

PROFESSOR NEVEN: That is right. The title of the table should be "Results using the before-during model".

MR BEARD: I think it is set out in the text, but the labelling of that table. As I understand it, is that the case for the next two tables as well?

PROFESSOR NEVEN: Yes. It is also the case with respect to table 20 and table 21 {E/35/86-87}.

THE CHAIRMAN: I think that would probably be obvious by the reference to AS/400.

MR BEARD: Yes, we think all of this is completely obvious, but we thought since Professor Neven brought it up, we should just deal with it.

THE CHAIRMAN: Yes. Fine.

MR BEARD: None of these would come as a surprise if you were actually reading the report, but it is one of those things that, as people are reviewing things, they notice, effectively, typographical matters.

I think, Professor Neven, those were all of the corrections.

PROFESSOR NEVEN: Yes.

MR BEARD: Thank you.

THE CHAIRMAN: Good.

MR BEARD: Thank you very much.

THE CHAIRMAN: So you have got your reports there in hard copy? Have you, Mr Harvey, as well?

MR HARVEY: Yes.

THE CHAIRMAN: You have got yours. Okay.

As you know, Mr Ridyard is going to lead the discussion on behalf of the tribunal so I will hand over to him.

Questions by THE TRIBUNAL

MR RIDYARD: Okay, thank you.

Just a couple of brief words before we start. The purpose of this session is obviously to try and achieve further synthesis of the views of the two experts, so hopefully to take things on from where you already got to on the joint reports, because there is a lot to digest for the tribunal there, so anything you can do to help us will be very useful.

You know already and you have got in your reports that it is -- your primary duty is to assist the tribunal. I just wanted to emphasise, that is not just a mantra or form of words; it is a real thing. I am sure you appreciate that, but please do appreciate that the extent to which you help the tribunal will be one of the factors that we take into account when we assess the evidence at the end of the procedures.

Thirdly, your audience -- I am going to be asking most of the questions, introducing most of the questions, but your audience for the answers is the whole tribunal and I cannot emphasise enough that all the tribunal, I am sure, will be engaged in the discussion that we have on the points, so just bear that in mind.

Then lastly, in the questions that we have put together, we have tried to cover the key topics. It is possible that we will have missed out things which you consider to be very important, and if those points come up during the course of the questioning or do not come up, then by all means bring that to our attention just in case we have missed something that is very important to help us to understand the case but which, for some reason, we have not managed to properly capture in the questions.

The plan for today is to go through the topics as far as we can, or today and tomorrow, go through the topics which you have already seen and the questions you have already seen. I am going to give both experts the opportunity to respond to all of these points, but I will more or less take it in turns as to who goes first. There is no particular method to who goes first, but I will make sure that both experts get an opportunity at least to comment on all of the topics and all of the questions.

I think that is pretty much all I have to say by way of introduction.

Let us move into the first topic, which is the general approach to the econometric analysis which underpins both of your results on overcharge.

The first question, perhaps Mr Harvey could go first on this one, is a rather general one which is, we would just like to understand from you what steps did you take to address the confirmation bias concerns? We are conscious that each one of you has produced a result which favours the particular client that you are working for, we are not shocked or surprised by that fact, but it does raise in our minds the possibility of some sort of confirmation bias in the analysis that you have done and we want to know what have you done to address that in the work that you have done. How can you assure us that you have addressed that concern in the results that you put forward?

Mr Harvey?

MR HARVEY: Yes, so two opening observations and then I will go to the steps. The first observation is that I did not have a prior as to what the figure would be, I had not seen the data beforehand, and so I did not enter into the analysis with a particular sum in mind.
Mr Ridyard, you referred to the Oxera study last week. That is a study that contains a sort of literature review of the typical overcharges that emerge from competition law infringements. It is true that that study says that a typical overcharge would be between 10 and 20%, but the study also shows that there is a very wide range indeed, so I was open-minded when

I approached the data. That is the first opening observation.

The second one is, this process encourages a lot of "Am I right?" questions along the way. The expectation or possibility that we will end up where we are, indeed the criticism that we receive from the other experts does sort of naturally encourage you to take a step back and ask yourself, "Have I looked at this in the right way?" and that is something that I did throughout.

So they are two sort of opening remarks that I guess condition the practical things that I did with the support of my team.

Then, in terms of the steps, the first thing is that all of the modelling that I undertook, I tried to link those decisions to what I knew from the facts and from the witness statements and set them out plainly in the report. Obviously, part of that is to explain why I have done what I have done, but, in doing that, it sort of forces you to think quite carefully about the link between those facts and your modelling decisions, so it encourages more of those "Am I right?" questions.

The second thing is that we are -- it is a difficult task. There is some science in what we are doing, there is obviously a lot of statistical analysis, but there are decisions that require reasoning and judgment.

Where those decisions were difficult, I looked in to preparing some sensitivity analyses to examine the effect of those decisions. Sometimes I found that the overcharge figures were considerably higher than the central ones that I have presented, and they have been included. Other times, I have found that they are lower and they have been included.

But where I was uncertain whether there was a justification to include a larger number, one example -- we will go on to talk about in the AS/400 data, whether to include the emissions premia, I sort of thought about that quite carefully and did not jump to grab the figure that emerged from the data and present that as my central case.

So those are sort of some of the steps, practically, that I went through. Of course, as I think Professor Neven said last week, you also need a team that is prepared to ask you "Are you right?" and exercise some independent thought to challenge me along the way, and that is what I have. So hopefully that gives you a bit of a flavour of the sorts of considerations that were in my mind when I prepared the report.

MR RIDYARD: Professor Neven, you have already given us a partial answer to this question last week, but do you want to add anything to what you said in the evidence last week?

PROFESSOR NEVEN: Yes, I may want to add something which is specific to the econometric analysis because what I emphasised last week is the fact that in order to avoid confirmation bias in this cognitive capture, it is important to have different teams, it is important to have people who challenge.

I would add that, in this particular instance, I also sought the advice of a professor of econometrics at the university, and quite characteristically, I put forward questions to him without ever suggesting the answer. So, I mean, whenever I wanted to have clarity and certainty on the technical issue, I asked him, I put forward the question without a suggested answer to see whether my understanding was confirmed by his own understanding. So that is with respect to the team aspect and the importance to have challenge on the approach.

Now, with respect to the econometrics itself, I think that in order to avoid cognitive capture in this confirmation bias, it is important to always go back to first principle and to always try to understand why you have a result that may not correspond to your prior. I mean, for instance, if you get an overcharge estimate in a particular specification that is negative, I mean, rather than saying "Look, that does not make sense because overcharges should be positive", I think that what is important is to try to understand why you are getting that number. I mean, why is it that the particular specification that you have adopted involves an identification strategy that actually does not enable you to properly estimate the infringement? Why is it that the infringement may be confounded with something else?

I think the really important discipline in econometric analysis to avoid this problem of confirmation bias is to always go back to first principle, always understand, you know, why is it that you are getting this number? Why is it that, you know, by changing the specification, you are actually implementing an identification strategy that is different, that might explain this number? What is the type of variation in the data that leads to this particular result?

Because if you do not do this, you know, if you sort of reject estimates that do not correspond to your prior without fundamentally understanding why you are getting this result, then there is a real risk of confirmation bias. You are just rejecting what does not correspond to your prior and then it is becoming circular. So I think that is just important to understand.

MR RIDYARD: Did either of you concede any points -- after the first reports, my impression is that you -- you both produced second and third reports, and then really the very long joint report, but did either of you concede that you were wrong on things and -- in the light of the interaction with the other expert?

Mr Harvey?

MR HARVEY: There is one area that I reconsidered and that relates to exchange rates, so we will talk about that in some detail. But this point about pass-through being immediate or there being a lag, I did investigate sensitivity analysis that examined that because I could see that the possibility of exchange rate pass-through from one day to another day may be extreme. So I reconsidered that. I think that is the main one.

MR RIDYARD: Professor Neven?

PROFESSOR NEVEN: I think that we have been learning in the process and I think that the reports, in particular the first report -- well, both reports actually that were put forward by Mr Harvey, have sort of pushed me and the team in clarifying some issues and in sort of better understand why I was getting some results. I think, at the end, having a better understanding of the underlying identification problem in this exercise and have I think more confidence in the result.

MR RIDYARD: So there is nothing specific that was -- that you thought, "Oh, actually, he is right on that and I have --"

PROFESSOR NEVEN: I think he raised important questions, okay, and he pushed me to addressing these questions. Whether with respect to the exchange rate and with respect to the financial crisis, which are probably the main issues that we are going to discuss in the next couple of days, whether it sort of led me to change my perspective, I would not think so.

MR RIDYARD: Before we leave this topic, Professor Neven, your position is perhaps slightly different from Mr Harvey's in that we had the whole discussion last week about plausibility. One way of looking at it would be to say that you went into the econometrics with a prior belief that the answer was zero. Do you think -- is that a fair or unfair characterisation, and in either case, does that affect, do you think -- does that give you more -- more onus on you to address confirmation bias than Mr Harvey, who says he went in with an open mind?

PROFESSOR NEVEN: Yes, I mean, you are asking a question about introspection here. I mean, did I -- is it that

I was affected by the analysis that I undertook with respect to plausibility? I think I did everything in order to avoid that bias. As I said last week, I mean, these two analyses were carried out in parallel, so there was no sort of clear timing. I mean, maybe I started with plausibility a little earlier, but I mean they were essentially carried out in parallel. So -- or what I say -- what I can say is that, you know, I do not think that I was, you know, looking for a result that would be consistent with my plausibility analysis.

THE CHAIRMAN: So are you saying that you developed your plausibility theory in tandem with the econometrics?

PROFESSOR NEVEN: Yes, that is right. That is right.

THE CHAIRMAN: One -- each confirmed the other?

PROFESSOR NEVEN: Yes, and they confirmed one another, that is right.

THE CHAIRMAN: Right.

MR RIDYARD: Okay. So the second question we have on our list here relates specifically to the two data sets. We know that the AS/400 data is not of the same quality as the MI data that was available later on in the analysis period.

So, Professor Neven, the question for you: given the problems that clearly exist with the granularity of the AS/400 data, is it really of any use in this whole exercise?

PROFESSOR NEVEN: Yes, I mean, as you pointed out, the main issue with the AS/400 data is the fact that it does not have granular cost, I mean, it only has average cost from different sources than the source that we have for the prices. I mean, it has sort of other draw-backs, some of the variables are not observed in the same positions, there are more missing values and there are sort of variables that are not observed as regularly. We do not have the budget rate. I mean, we have to impute the budget rate within the logic that we see for the determination of the budget rate in the second part of the sample. So, I mean, there are sort of various issues with the AS/400, but I agree with you that the main issue is the fact that we do not have detailed cost data.

Now, I would just like to emphasise the fact that having detailed cost data is actually very important for identification. As I have explained in my report, the cross-section in the cost data, the fact that, I mean, you have cost that varies across trucks with different specifications at any given point in time is something that is essential for the identification, and, in particular, in order to be able to disentangle the effect of the exchange rate from the effect of the infringement. So this is something that is really essential.

Now, the other dimension in which the cross-section is important is with respect to the truck mix. This is an issue that I have emphasised. What happens is that because the data that is available for the earlier period, the AS/400, is only average cost for a particular series typically, and typically at the monthly level. We do not observe -- I mean, whole cost will vary with respect to characteristics that may be important. I took the example, I think in my third report, with respect to bodies. I mean, we do not actually observe whether the trucks had bodies or not, and we have an average cost data and some trucks will have bodies and other trucks will not have bodies.

So if, after the beginning of the infringement, all of a sudden you have in the data a truck that has a body but I cannot control for it, I mean, this is going to show up potentially as being attributed to the infringement.

So the cross-section dimension for cost is essential in order to control for the truck mix. It is essential in order to disentangle the effect of the exchange rate from the effect of the infringement. So I just want to emphasise this.

Now, you are asking me, is it that this data is completely useless? No, I do not think it is completely useless. I think that it is useful to use this AS/400 data as a complement to the MI data, and this is the approach that I am using because, as you have seen, in my report, I am doing an estimate which is using both the AS/400 and the MI data in the context of a before/during/after estimation. I think that we probably have the opportunity to discuss that in detail, but what I want to say is that using that data from my perspective is useful as a complement to the MI data, also to confirm some of the findings that I have with the MI data.

MR RIDYARD: Mr Harvey, your perspective on that one?

MR HARVEY: Well, obviously I have prepared a before/during model using the AS/400 data so I do think it is useful. In terms of my thought process, I think there is quite a high hurdle to disregard that data. It covers the first half of the infringement period and includes a significant proportion of the claimants' VOC. In addition, in a sense, it gives us an extra point of comparison, ie the period prior to the cartel, to investigate. So I think -- the start point is that I think a curious economist would look at it and should. It is correct that the data is not as good as the MI period in some respects, and the truck level versus the average level cost is one of them. I will talk about that briefly in a moment.

But there are other characteristics of this data set that, relative to what we could have got, is quite good in that we do have relatively complete data on the prices that were paid, the truck sales that were made in that period, the characteristics of the trucks that were purchased, who bought them, that type of thing.

So when we look at that, it is important to see I think the full context of that data set, not just the one feature of it.

It is obviously the case that in the econometric analysis, the cost variables are important. What I sought to do was to examine, using the during/after period, the extent to which using a less granular cost measure would affect the overcharge estimate, so kind of test this proposition as to whether using the inferior, as it were, cost data would matter, in the best way that I could. So imperfect, but eminently usable and very sensible to look at, is my take.

SIR IAIN MCMILLAN: I was just going to ask, I think that you did recognise that there were risks in the AS/400 data in was it annex 1?

MR HARVEY: Yes.

SIR IAIN MCMILLAN: Are you satisfied that there was enough other material or treatment of the data that you were able to mitigate these risks to a satisfactory degree?

MR HARVEY: Yes. I think two things. Firstly, we could have been in a situation where there was no cost data at all, and that is not the situation that we are in. We could have been in a situation where we had just average cost for everything over time. That is not the situation we are in either. We have an average cost measure for the larger trucks, CF and XF trucks, and we have cost measures for four of the LF truck series. So that is the first one. There is an alternative that we can use, albeit not as good, but which I accept as having the truck level data.

The second part of that is that the concern is that there is a mix effect that is caught up in those average cost variables, but we do have the characteristics of the trucks that were sold and so can control for some of those differences in the analysis.

Then, finally, as I said earlier, I was able to do a little bit of an experiment, as it were, with the during/after data to see whether swapping out the granular data and putting in the less granular data, what effect that would have, so --

THE CHAIRMAN: What did that come out as? Did that -- that

came out as pretty much the same?
MR HARVEY: Yes.
THE CHAIRMAN: Right, so the case is that that was the only -- that is the best evidence available?
MR HARVEY: Yes.
THE CHAIRMAN: For testing the before/during period?
MR HARVEY: Yes, I think it is the best that we are able to -- it is the data that we have.
THE CHAIRMAN: Yes. I mean, you have got to go with whatever data is provided to you.
MR HARVEY: Yes, but I suppose what I am trying to emphasise is that it is right to take the pause and say, "What do we have instead? Can we deal with some of the issues that a lack of granularity creates? Can we test the effect it has on the overcharge in the period where we have both?" So I am certainly not trying to advocate that it is, you know, it is all we have so we had best just use it. That is not the case at all. I am trying to say that you do need to go through these steps quite carefully, but where my, I would say, my hurdle for disregarding it is relatively high because this data covers half of the infringement period and a lot of the sales and allows us another point of comparison, which is the pre-cartel period.
THE CHAIRMAN: Yes.

MR HARVEY: That is how I thought about it.

THE CHAIRMAN: Did you want to say something?

PROFESSOR NEVEN: Yes, I want to say something. Of course, I agree with Mr Harvey that the benefit of using the AS/400 data is that you have an additional counterfactual in the data. I mean, you have the prices before the infringement starts; that is obviously a benefit from using that data.

Now, I just want to highlight the fact that there is a disagreement between Mr Harvey and myself that maybe we will discuss sort of later in detail, about the extent to which the combination between the use of the average cost data plus the truck characteristics is actually as good as using truck-level data. So I think that is an issue that we will have to discuss and I have concern about the use of the average cost data together with the truck characteristics. So I do not think that, you know, the combination between these two, I mean the average cost data plus the truck characteristics, do as good a job as the truck level cost data.

Now, I mean, clearly I agree with Mr Harvey that we do not want to disregard this data all together, and I do not. I mean, I am using this data also in the context of the before/during analysis, but I think that, to go back to what I was saying earlier, when you use that data, you want to be really careful about how the identification of the infringement is actually undertaken, given the shortcomings of that data. So, yes, that is the best we have. I mean, I am also using that data, but, really, care has to be exercised with respect to, you know, how we identify the infringement there.

MR RIDYARD: What I understood Mr Harvey to say just now was that, as a cross-check, he deliberately sort of downgraded the quality of the data in the second period to see if downgrading it in that way and having run it on the good data, running it on the poorer data produced a similar result. Do you disagree with his results --

PROFESSOR NEVEN: No, I disagree.

MR RIDYARD: Maybe it is worth just exploring that a little bit now then. Why?

PROFESSOR NEVEN: No, I disagree with it because I think that the reason as to why he obtains these results -- so essentially what he does is that he is using the MI period and in the MI period I see there I can choose. Okay? I can either choose the truck level cost data or I can use the average cost data together with the truck characteristics. He says that whether he does one or the other actually leads to similar infringement estimates. Now, third observation is that when I do the same exercise with my identification strategy, that is to say when I estimate the model in pounds and when I do not include the dummies for the financial crisis, I get completely opposite result. That is to say that, if, in my estimate, I used the truck level cost data, and then progressively aggregate the data, so I do the exercise by stage, I say, okay, I mean, instead of using the truck level cost data, I aggregate them by series, then I aggregate them by family, then I see that my results are becoming very different. So --

THE CHAIRMAN: Those are different points, are they not?

PROFESSOR NEVEN: I do not think so. It is just that, in his estimate, if he is using -- if he is comparing, sorry, estimates with the truck level cost data with estimates with the average cost data together with characteristics, he says he obtains similar result. If I do the same exercise in my model, I do not get the same; okay?

So, essentially, we are getting sort of divergent results here, and I think that --

THE CHAIRMAN: So you have done the same process --

PROFESSOR NEVEN: Yes, exactly.

THE CHAIRMAN: -- as him on your model --

PROFESSOR NEVEN: Exactly.

THE CHAIRMAN: -- and it comes out differently --

PROFESSOR NEVEN: Completely the opposite.

THE CHAIRMAN: Right.

PROFESSOR NEVEN: I mean, completely the opposite in the sense that when I aggregate the data, when I use average cost data with truck characteristics, I get very negative infringement, so we need to understand why, you know, he has this result and I have the opposite result.

I think the reason as to why he gets this result is essentially because of the specification of this model, in particular with respect to the way in which he models the financial crisis. I mean, I think that because he is using these dummies for the financial crisis, he is imposing a completely different identification in this model, which we will discuss at length, but I think that the cost variable in this model and the cost variable in my model actually play a very different role and that is why he is obtaining these results.

But I think that I -- as I said, I mean, I obtain different results and I also, as we are going to discuss in the next couple of days, I understand why he is obtaining the results that he is getting. It is essentially because he is getting all the variation of the data out with the financial crisis.

THE CHAIRMAN: Sorry, just to be clear, when you are testing Mr Harvey's analysis, which attempted to sort of convert the truck level data into average --

PROFESSOR NEVEN: Yes.

THE CHAIRMAN: Yes? Average truck prices, then that did not work. It came out differently to when you were using just the MI --

PROFESSOR NEVEN: That is right. That is correct.

I think I understand why Mr Harvey is getting a different result from me. I think the reason why he is getting this different result is because of the specification of his model in the MI period, which includes the dummies for the financial crisis.

Actually, I ran the estimate of Mr Harvey without the financial crisis and see whether the cost data matters, and it matters.

MR RIDYARD: Mr Harvey, a response from you on that point?

MR HARVEY: Well, two thoughts. The first is that the tests that Professor Neven has described on his own analysis, I think the result is that when you move to a more aggregate cost measure, the overcharge in his analysis goes lower.

PROFESSOR NEVEN: Negative.

MR HARVEY: So I think he is saying it does matter switching the data out. I do not think there is any evidence to suggest that using those aggregate measures leads to an upward bias in my overcharge estimate.

Secondly, in relation to how good the combination of characteristics and average cost measures are, I did examine how well those characteristics explain truck level MLO costs, so again, using the during/after period, what you can do is to say, how much of the variation in truck level MLO costs can be explained by the characteristics of the trucks? A very high proportion of that variation can be explained by those variables, which gives me some reassurance they are doing a good job.

Professor Neven is correct though, and we will find this I think throughout this conversation, that some of our findings with respect to different issues will be affected by some of our decisions in relation to different issues as well. So I accept that in his model he might find something different, but I am satisfied with the tests that I have done within the context of my model, and outside of my model, that those truck characteristics explain a high proportion of the MLO costs which gives me some reassurance. So that would be my response.

MR RIDYARD: Okay.

MR BEARD: Sir, if you were going to move on, there was one -- I know that normally we would leave clarification to the end, but there was a term that was used that

I just wonder whether it is worth clarifying for the members of the tribunal, who may be familiar with it, but there was a reference to cross-sectional nature of data. I know that is a term that will be well-known to you, but I do not know whether it is a term that the other members of the tribunal are so familiar with, and I just wondered whether -- it is a matter for both experts to talk about it, but I wondered whether it was worth picking up as a clarification now before we went on? Sorry to intrude.

MR RIDYARD: Okay. Briefly.

PROFESSOR NEVEN: By the cross-section, we essentially mean the variation that is occurring in a variable across different trucks at a given period of time. So if you think about the cost, for instance, I mean, you can look at how the cost varies over time and you can look at how the cost varies at any given point in time between different types of trucks. I mean, what is the cost of an LF truck? What is the cost of a CF truck? What is the cost of an XF? How does the cost vary according to the characteristics of the truck? So when we talk about the cross-section variation, we talk about the variation in the cost of a truck across different trucks with different specifications at a given point in time.

We are going to go back to this a lot, because the issue of identification in this exercise here really hinges on that dimension. How can we use the fact that you have data on different trucks with different characteristics at a given point in time to identify the effect of the infringement and the effect of the exchange rate relative to using simply the truck series.

MR RIDYARD: Okay.

Mr Harvey, the -- a moment -- or a while ago now, Professor Neven mentioned the possibility of mix effects, which is sort what we were just talking about just now, you could have some trucks with bodies and some trucks without bodies, and if there was a change in the mix between one period and another that could really effect prices without it being picked up in some other aspects. Is there any reason to think there are different mixes in the data sets? Looking at the two data sets, the AS data and the MI data, that would lead to some systematic difference in the type of trucks that are in the data in the two data sets, that would cause us concern? Or is it just uncertainty in general?

MR HARVEY: The mix of trucks will obviously change over time, new models and so forth are being introduced throughout the time period. I suppose the relevant mix effects that matter, I think, are those that you cannot see, so those that you cannot control for in the analysis. So --

MR RIDYARD: Sorry, I should have made clear in my question that obviously the focus here is on the AS/400 period in particular because that is when we do not have as good a handle on -- we have these broad categories rather than more granular approach.

MR HARVEY: Yes. Well, what we do have in that period though is we do have data on the characteristics of the trucks, the series of the trucks which sort of define how big they are and many axles and their horsepower and so forth. I am not aware of anything that would systematically move over time that is not captured by those transaction controls that we do have.

MR RIDYARD: So it is noisier, but you have got no particular reason to think it is noisy in one direction or the other?

MR HARVEY: I do not think so, no.

MR RIDYARD: Yes.

Professor Neven, do you?

PROFESSOR NEVEN: No, I think I disagree with this. I explained it in my third report. In my third report, I show that there is a change in the significance of options in the AS/400 period, respectively before the beginning of the infringement and after the beginning of the infringement. I see that the share option is actually increasing.

But why does that matter? It matters because indeed we have changes in the truck mix, so at any point in time you have a different truck mix, different types of trucks are being sold, and as Mr Harvey has explained, what matters is whether you can control for it; okay?

Now, in the AS/400 period, we do not have cost data that would reflect the options on the truck because we have average costs; okay? Now, it means that we are trying to explain the truck -- the price, sorry, of a truck that may have a lot of options in terms of an average cost of trucks that will include options as well few options. You know, this can potentially lead to a problem with respect to the identification of the infringement, if the significance of the options, the distribution of the options around this average is changing between the period before the infringement and after.

If, I mean, indeed the significance of the option is increasing after the beginning of the infringement, there will be an issue in the sense that there are sort of -- it is more likely that you will have truck with lots of options that have high prices that cannot be explained by the average cost, and this could lead to a -- potentially, again, a bias in the infringement because you see that there are high prices with trucks that have lots of options that cannot be explained by the average price.

So, yes, I think that there is a reason to be concerned about this.

SIR IAIN MCMILLAN: That is very helpful, Professor.

I think that the issue of the product mix effects and the average truck, I think, am I right, Mr Harvey, that you explore that and address that issue again in annex 1, about how you overcame the potential unreliability of that?

MR HARVEY: What we tried to do was to add in some more controls for the characteristics. Is that the ...? Maybe we will go to annex 1. I think that might be the sensitivity that you are referring to.

SIR IAIN MCMILLAN: Yes, I think there was a point somewhere in annex 1, and I do apologise for not being able to take you straight to it, I am doing this from memory, where you justified your approach to addressing the problems that Professor Neven has explained.

I think I have written down here 2.31 figure, that is perhaps where I saw that.

THE CHAIRMAN: Do you have a reference for --

MR HARVEY: I have found it. It is {E/IC2/31}.

THE CHAIRMAN: Thank you. Which page?

MR HARVEY: 31.
THE CHAIRMAN: 31.
MR HARVEY: So there are two observations. We did two things. The first is, we attempted to include more truck characteristic controls in the earlier period. What this chart is trying to do is to understand the relationship between the average MLO cost and invoice prices to see whether they are sort of correlated with one another, and this is the chart showing that they are. Now, obviously it is also showing that there is some variation around this line, but this gave me some reassurance that there was a link between these MLO costs and the average invoice prices. I think, although Professor Neven is correct to say that there is a possibly, of course, that trucks with more options might be provided at a higher price, we also need to believe that those trucks have been provided at a higher price and there would not be an increase in the average MLO costs associated -- well, actually, the costs would not go up in the way that would be associated those extra options too. So it is almost that those -- there needs to be some greater disconnect, as it were, between costs in the price of those options --
MR RIDYARD: Higher margins for more highly specified trucks?

MR HARVEY: Potentially, yes. That type of thing. So that is something that we cannot investigate here. But this analysis was included to give some reassurance that there is this sort of broad relationship between the costs and the prices.

MR RIDYARD: Professor Neven?

PROFESSOR NEVEN: I do not think that this particular figure is revealing actually, because this particular figure is looking at the MLO cost on the horizontal axis and the price on the vertical axis --

MR RIDYARD: Your point was, over time, the mix changed. Yes. I understand the point, yes.

PROFESSOR NEVEN: Exactly, so I do not think this figure is revealing. I think that there is common ground between Mr Harvey and myself that the share -- I mean, the cost that is associated with the share of option, you just do not observe it. I mean, and we know that the share of option is changing over time.

So I appreciate that he has tried to control for this shortcoming of the data by introducing some characteristics, but there are some key characteristics we simply do not observe.

MR RIDYARD: Thank you.

Let us move to the broader subject of before/during/after modelling.

First of all, Professor Neven, are there any a priori reasons for expecting that a before/during estimate is likely to differ from a during/after estimate, assuming one had comparable data in the two periods?

PROFESSOR NEVEN: There is a very significant challenge with any before/during analysis and the big challenge is the very sharp appreciation of the sterling, of the pound, at the beginning of the infringement.

What is happening is that the infringement starts at the same time the pound sterling is appreciating. Now, you have to think about what are the consequences of that with respect to prices? It means that the pound is appreciating, it means that DAF, which is incurring cost in euros mostly, all of a sudden is going to become more competitive because it has cost in euro, the pound is appreciating. So you would expect that, you know, DAF becoming more competitive, I mean, might adjust the prices in pounds. So there is going to be -- one of the key factors which will determine the prices that DAF is going to charge in pounds, which is determined by the exchange rate which is affected by the exchange rate.

MR RIDYARD: You say more competitive, but I mean everyone is having costs in euros.

PROFESSOR NEVEN: Okay. Two observations with respect to that is that DAF is becoming more competitive in relation to demand; okay? I will address the point of the competitors in a second, but DAF is becoming -- if you think about DAF's position in relation to customers' willingness to pay, customers' willingness to pay is determined by their situation in the UK market and is determined in pounds. All of a sudden, DAF is becoming a lower cost producer, and so, when you are becoming a lower cost producer, you expect that prices are going to be affected.

Now, what is interesting, as you pointed out, is that, of course, all the other truck manufacturers have the same issue because they also are incurring their cost in euros or possibly in Swedish krone, but the Swedish krone, I think it is likely that the truck -- I do not know, but it is likely that the trucks that are produced by Scania also has a very high euro content. So indeed all of them are affected.

But, I mean, we know that even when all competitors are affected by the change in cost which is a common change in cost, they do not sort of pass on this change in cost completely. This is a very strong result, is that, you know, even though everyone, all the manufacturers, were in that position, so even though all the manufacturers all of a sudden had lower costs in relation to the UK demand, you would not expect that this change in cost would necessarily lead to a one to one change in the price in my example to a one to one reduction in the price. I think that their empirical evidence and economic theory is quite clear, actually there was a BP report in 2009, which is a very useful report, that sort of shows quite clearly that it is only with extreme conditions, where you have perfect competition, where all the products are very, very close substitute, that you will get a pass on the disclosed amount.

MR RIDYARD: I do not want to go into the whole exchange rate topic because we will give that good airtime later on in the process.

Is there anything more broadly about -- just taking it away from the facts of this case, but just more broadly about whether you might expect a before/during effect to differ from a during/after effect?

PROFESSOR NEVEN: Okay, fine. I looked at it from an empirical perspective and indeed I highlighted the problem of the exchange rate. I should also highlight at the same time the fact that we do not have the proper data to identify it because we do not have data that varies across trucks, so that is on the exchange rate side.

Now, do we expect in terms of the evidence in the case that the infringement effect is different during the first part of the infringement and the second part of the infringement?

Well, what is the file telling us? The file is telling us that during the first part of the infringement, the contacts between the manufacturers were taking place at the headquarter level. After 2003/2004, which corresponds to the MI data, I mean, most of the infringement is actually in terms of the exchange that was taking place in Germany.

Is it that these two different types of conducts, as described by the European Commission, would expect you to have a different infringement effect? Honestly, I do not know. I mean, that is possibly something that you want to test empirically, and indeed, in the context of what I am doing, of having on the one hand a before/during analysis, but also -- sorry, a during/after analysis, but also a before/during/after analysis, I can also test that, but Mr Harvey can also test it in his approach.

So I do not have a strong prior as to why the infringement effect should be very different in the first part of the infringement from the second part of the infringement.

One argument might be that, because in the second part of the infringement the exchange of information was more organised, I mean it was more regular, maybe it should have a stronger effect, but at the same time, it is relevant for the UK, it is much less clear. So, honestly --

THE CHAIRMAN: Correct me if I am wrong, but I think the question is more related to whether there is some particular reason about -- that differs -- that makes it better to look at a before/during analysis as opposed to a during/after analysis.

PROFESSOR NEVEN: Okay, so --

THE CHAIRMAN: Not about the particular way the infringement operated or anything like that. Whether it is better to look at a before/during or a during/after.

PROFESSOR NEVEN: I try to -- so what I meant to say with respect to my explanation is that, you know, it is useful to look at the before/during precisely in order to test this idea that maybe the infringement was different; okay? So that was the sense of my answer.

Even though, as I was trying to explain, it is not clear a priori that you would expect the effects to be different, but, you know, testing whether the effects are different in the first part of the infringement and the second part of the infringement is potentially something that is useful. As Mr Harvey has said, using the counterfactual before is also something that is potentially useful.

MR RIDYARD: Mr Harvey?

MR HARVEY: I did not have a prior expectation of the true infringement effect differing over the time period, although it is possible I suppose. One of the reasons that is typically cited for -- in a perfect data world, favouring a before/during comparison rather than a during/after comparison is the possibility that the effect of the infringement does not unravel immediately, so probably labelled as an "overhang". I mention that as a possibility in my report. I do not put it too high because I do not know the mechanics of exactly how the infringement operated. But what I did observe is that the cooperation involved obviously the discussions surrounding the euro standards, some of which were sold after the infringement period.

The second sort of looser argument that is given is, once a market has operated in a particular way for a long time, it may take time for a new competitive norm to be established. So that is a sort of in principle reason as to why, extracting from the data that we have in this case, one might attach more weight to a before/during comparison than during/after comparison.

It is a possibility that I have mentioned in my report.

MR RIDYARD: But for both of you, the econometric model is just a dummy variable, which is a 1 or 0, and so the working assumption of both of your econometric analyses was that the cartel was either on or off and that is it.

MR HARVEY: Correct, yes.

MR RIDYARD: I mean is there any -- given you have made this point, Mr Harvey, is there anything in your evidence -- did you put anything in from empirical literature or elsewhere in your references that would support the idea that the cartel effect might hang on even after a cartel infringement has finished, or is that purely a fact-specific --

MR HARVEY: No, I did not include. It seems to me that this is something that is inevitably quite idiosyncratic. It is something that would depend on the market and the nature of the infringement I think, so I did not, no.

MR RIDYARD: Thank you.

THE CHAIRMAN: Does the analysis show that it takes a few years after the end of the infringement for the overcharge to be eliminated?

MR HARVEY: No, I have not investigated that. What the analysis does show, it is sort of another example of the interactions that I spoke about earlier, there is a Euro 5 emissions premia, which we will talk about in detail. That is estimated using both the infringement period, but also there were some Euro 5 trucks sold after the infringement period too, so it sort of takes account of both. So I suppose, I did not interpret it in this way for the purposes of calculating the harm, but one interpretation of that is that is the element of, if you like, overcharge that carries on. As I say, I did not put it too high, but I suppose that is the closest I think to getting at the type of analysis that you have suggested.

MR RIDYARD: Professor Neven?

PROFESSOR NEVEN: Just two short observations. The first one is that the two counterfactuals that we have in the data are not equally good in terms of data, because the first counterfactual, as you know, which is the period 1995/1997, was very short. I mean, it is a period for which we do not have good cost data so we are not in a position to really have a good estimate -- well, we do not have the cost that is necessary; and, importantly, the trucks that are sold in this initial period are very specific. They are Euro 1 trucks, and it is only -- Euro 2 trucks are introduced only sort of a few months before the beginning of the infringement. So it is not a very good counterfactual. It is not comparable to the counterfactual that we have after the end of the infringement.

The second observation, but I do not want to anticipate on the discussion that we will surely have tomorrow, is that I do have a specification in which I can test for this overhang effect, in the sense that I allow the infringement to affect all Euro 5 trucks. That is to say, all trucks, Euro 5 specifications, that are sold, even after 2011. So I said, okay, I assume that all Euro 5 trucks are affected by infringement and my estimate does not change.

MR RIDYARD: We will come back to that on the emissions topic, as you suggest. Yes, okay. Thanks.

Professor Neven, maybe it would be useful for you to lead on this next one which is, looking at this whole before/during/after approach that you have adopted, one way -- it may be an oversimplification for characterising what you have done is, you have obviously recognised the weaknesses of the old data set and you have, in doing a before/during/after model, what you have tried to do in some sense is marry the old data set up with the newer data set, which is better, in order to use what can be used from the old data set and to link it in with the MI data set.

Is that -- can you comment on -- you can give a better explanation of what you have done than what

I just did, I am sure, and can you comment on what you see as the merits of that? Because clearly you think that there is a merit in marrying up the two data sets and using them both in one regression run across the whole period, but can you comment a bit more on why you think that is the appropriate approach and what the pros and cons of that approach are?

PROFESSOR NEVEN: Yes, I think that the benefit of using the MI -- the AS/400 data, sorry, the old data together with the new data is that you can actually mitigate by doing that the shortcomings of the old data. That is essentially because of how you measure cost in this next model. So in this model in which you are using both the AS/400 data, which is not truck specific cost, with the cost specific data, is that the model of course will have some good truck specific cost data for part of the estimation and some less reliable one. How does an econometric model work? An econometric model works by always giving the priority to the higher quality data, and that is because an econometric model is systematically minimising the difference between the data and what the model will predict.

So if, in a model for part of the sample, you have good data and for part of the sample you have less good data, the econometric model will always give more weight to the better data. So -- and that is because when you are giving more weight to the good data, that is where there is scope for reducing errors, because you have good cost data that can explain the prices better. So there is a technical reason as to why, by mixing the AS/400 data, which is average cost data, with the better MI data, which has cost level data. Why? You mitigate the shortcoming of the AS/400 data.

Actually, we see it quite clearly in the coefficient of the cost variable in this before/during/after model. I mean, of course, you see that of course this coefficient is not as high as the coefficient that I have in the during/after, because in the during/after, I am only using good data and I have a very good estimate of the extent to which the costs explains the price. If I put the two data sets together, I have a coefficient for the cost estimate that, of course, is going down, but is not going down to such an extent. So this is a clear indication that by putting the two data sets together, I make the best out of the cost data.

THE CHAIRMAN: Could you just explain for my benefit what you mean by the coefficient?

PROFESSOR NEVEN: Okay. So when you are estimating a regression model, essentially you are asking the model to explain the prices, the invoice prices, and you explain it in terms of all sorts of control variable, including the infringement. So, for instance, here we were referring to the cost; okay? So the model is going to estimate to what extent the invoice prices are explained by the costs of the trucks, and the relationship between the cost of the truck and the price of the truck, as revealed by the data, is captured by this coefficient. This coefficient is technically a number, if you want, that will express by how much, according to the data, the change in costs leads to a change in price. Typically, in my estimates, this coefficient is around 0.8. What does it mean? It means that an increase in point by 1% is going to lead to an increase in the invoice price of the truck by 0.8 of a per cent. That is what I get in my MI estimation.

If I use the AS/400 together with the MI, this coefficient goes down. Why? Because the data is less precise. So inevitably the cost data is going to be less good at explaining the prices, but this coefficient is not reducing, is not going down all that much, it is going down from around 0.8 to around 0.7.

MR RIDYARD: To what, sorry?

PROFESSOR NEVEN: 0.7.

MR RIDYARD: Mr Harvey, your thoughts on that?

MR HARVEY: The way I thought about this was to go back to the problem that we are seeking to solve. So the problem is a lack of granular cost data in the before/during period. Putting the two data sets together does not solve that problem. You do not create any new information by splicing them together. Obviously you do not, because you still do not have the underlying cost data. The arguments that Professor Neven has just been through seem to me to be not so much an argument for the before/during/after model, but an argument for why one might, in this case, attach more weight to a during/after model. So that is how I see this.

Is there a -- so, in a sense, you end up with sort of an average of the two data sets.

Then the question becomes in this case: is there a downside? Because, in a sense, you might say, no harm done by linking the two together, boosting the size of your sample, that type of thing. I think in this case there is a downside and the downside is that it becomes difficult to interpret the emission standard premia. So I mentioned earlier that -- we have discussed I think in a previous part of this hearing that one of the things that we both find is a margin attracted to the later emission standards. I have interpreted that as a cartel effect. I am only able to do that because of having granular cost data. If I do not have granular cost data, I run the risk that I misinterpret that effect, not as a margin effect, but actually as just an elevation in cost that I have not been able to control for. So I see a benefit of keeping these data sets separate, because it allows me to investigate that effect in the during/after period, whereas when you bring them together you lose that ability.

So I think that is how I feel. I do not feel that bringing together the two data sets solves the underlying problem. It also means that that model cannot be used for one of the things that we are using during/after data for.

MR RIDYARD: Just going specifically on the costs -- the cost explanator for prices, from memory, I think that in your before/during model, you have got a cost coefficient of something like 0.35 or something? 0.3 something?

MR HARVEY: Yes, that is right.

MR RIDYARD: Whereas in the during/after you get a much higher cost coefficient, and Professor Neven has drawn attention to the gap between those two costs -- the apparent impact of costs on prices in the two models.

He described how, by marrying the two data sets up, he believed that he could narrow that gap and that gave

him some reassurance. So can you just comment on that specific point?
MR HARVEY: Well, I think the issue is whether the lower cost coefficient would give rise to -- could give rise to a bias in the overcharge estimate.
MR RIDYARD: Yes.
MR HARVEY: It is not surprising to me that the two cost coefficients are different because, obviously, we have different data and measuring different things. We are measuring, in one, the impact of changes in average costs on prices at the truck level, and in the other data set, we are measuring the impact of truck cost changes on individual trucks. So it is not surprising to me that we get a difference. It does not follow from that that one estimate of the overcharge is biased. That depends on whether we have adequately controlled for costs over time, some of the discussion we have already had.
I recognise that when you blend the data together, you unsurprisingly get a number that is somewhere between the lower number and the higher number, but I do not think that of itself is -- means that it is a better regression for the purpose that we have got here. That is my reaction to that.
THE CHAIRMAN: Is that coefficient then as an average over

the whole period?

MR HARVEY: So this -- yes, sorry, I have bundled two concepts in there. So the coefficient that is estimated, this relationship between costs and prices, is an average, so it takes all of the data over the whole period and indeed between trucks, and says, on average, how do prices change when costs change. That is true, irrespective of the granularity of data that you are using.

In the before/during regression, the results of that say -- that cost coefficient, say the responsiveness of truck level prices, individual truck prices to costs is lower. What I am saying is, why is that? The reason that happens is because we are modelling something a little bit different. We are modelling the responsiveness of individual truck prices to average truck costs, whereas in the later period we are looking at the responsiveness of individual truck prices to individual truck costs. So, understandably, you get a, kind of a stronger, as it were, relationship between the variables in the different data periods. Is that ...?

THE CHAIRMAN: Yes.

So where, Professor Neven, you took the whole period of infringement and come out with a coefficient of 0.7 I think you said, whereas it was 0.8 for the --

during -- for the later period?

PROFESSOR NEVEN: Exactly. That is right.

THE CHAIRMAN: Okay. So, well, obviously, if you are averaging out for the whole period, it is going to be higher than just the before/during figures?

PROFESSOR NEVEN: Yes. Of course. Of course, the coefficient I get by using only the during/after would be higher, but I was drawing attention to the fact that when I use the AS/400 data together with the truck level data for the MI period, this coefficient does not come down so much.

So the cost is still playing an important role in explaining the prices in the entire sample.

I think that I just want to comment on what Mr Harvey said here, because getting a good estimate of how costs affect prices is crucial for identification here. I mean, to make the best use as possible of the truck level cost data that we have for the MI period and using it also to pool, so to speak, the information that we have in the AS/400 data is important.

MR RIDYARD: Does it really do that? I mean, as Mr Harvey said, the data for the earlier period is just not very good and that is true whether you put it in with some good data which happens to apply to a later on period. Does the goodness of the later period, does it somehow --

PROFESSOR NEVEN: Yes, it does.

MR RIDYARD: -- cross-infect in a positive way the badness of the data in the earlier period?

PROFESSOR NEVEN: It does actually because when you estimate the model on the two data sets together, you end up with a coefficient which leads to an explanation of the prices by the costs, and this has an impact on how well you can estimate the infringement. So the fact that this cost coefficient is higher has an impact on the identification of the infringement.

THE CHAIRMAN: Can I ask, did you do a before/during analysis?

PROFESSOR NEVEN: Yes, this is one of the -- indeed, this morning, when we were referring to the tables for which I changed the label, the table 19/20/21 in my second report, I did experiment with the before/during analysis.

THE CHAIRMAN: Did it come out with a very different figure, the before/during/after?

PROFESSOR NEVEN: Yes.

THE CHAIRMAN: It did?

PROFESSOR NEVEN: It does, yes.

THE CHAIRMAN: It showed an overcharge?

PROFESSOR NEVEN: It really depends on the way in which we deal with the exchange rate.

THE CHAIRMAN: Okay.

PROFESSOR NEVEN: What I show is that the problem with this before/during analysis is what I referred to earlier, is this massive appreciation of the pound at the beginning of the infringement.

THE CHAIRMAN: Yes.

PROFESSOR NEVEN: If -- using my approach to identify this effect of the -- okay, using an alternative approach to try to identify the effect of this appreciation of the pound, I get a slightly negative overcharge.

THE CHAIRMAN: The effects of the strengthening of the pound at the start of the infringement period, I think is what you are saying.

PROFESSOR NEVEN: Yes.

THE CHAIRMAN: Are you saying that that is mitigated by using a before/during/after approach, rather than just a before/during?

PROFESSOR NEVEN: Yes. Indeed. Indeed. I am better able to control for the exchange rate by using a larger sample, because indeed -- I mean, the basic problem of controlling for the exchange rate is this sort of sharp appreciation at the beginning, and, of course, if you are using a longer sample, you have sort of different changes in the exchange rate. If you are thinking about, you know, the behaviour of the pound during the period, you have the sharp appreciation at the beginning, and then I mean you have another sharp change in the exchange rate of the pound, which is in 2008, at the beginning of the financial crisis, you have a sharp depreciation of the pound. Then the pound is sort of staying low, I mean, for the end of the infringement and starts to rise after the infringement, so you get much more variation in the baseline.

THE CHAIRMAN: So it smooths out over time?

PROFESSOR NEVEN: The important point is that you get much more variation in the data because you do not have only this massive change. You also have other changes and this enables you to better isolate the effect of the exchange rate from the infringement in particular.

Can I just say one more observation on what Mr Harvey said earlier? I did not follow his argument with respect to the emission standards, because he seems to say that when I estimate a before/during/after model, there is a problem with respect to the identification of the emission standards. I do not follow that, because I agree with him that, with respect to Euro 2 in particular, this is a period for which we do not have good cost data so it is hard to tell whether the premium that we estimate for Euro 2 trucks is due to cost or is due to something else; okay?

Similarly, for the -- well, essentially for Euro 2.

But the fact that it is hard to interpret what is happening with respect to Euro 2 has no pollution effect on how we can estimate and potentially interpret what is happening with respect to the emission standard dummy for Euro 4, Euro 5 or Euro 6. The fact that it is difficult to interpret a premium with respect to the trucks that were introduced, in an environment in which we do not have good cost data, is there, whether you do your before/during, or whether you do a before/during/after.

THE CHAIRMAN: We need to have our ten-minute break so we will do that now. We will come back in ten minutes.

(11.57 am)

(A short break)

(12.10 pm)

MR RIDYARD: I think I have one final question on this topic of the before/during/after, which is actually picking up a point that Professor Neven made before the break, which was about the number of observations that are available.

In a way, this goes back to the prior questions about whether the before period is analysable or useful at all.

I think, Professor Neven, in your evidence, you say there is only about 50,000 observations of Euro 2 trucks that are sold before the cartel period, so everything is resting on those observations; is that right? If so, can you comment on how many observations you think you would be comfortable with? How many usable observations you would be comfortable to make useful use of the before/during period?

PROFESSOR NEVEN: No, there is no magic number of observation that is sufficient in order to perform a reliable estimation. What matters is the variability that you have in the data. I mean, you can have a lot of data, but if there is no variability in that data in order to identify particular effects, it is of no use.

MR RIDYARD: Sorry to interrupt, it was 5,000, not 50,000 observations.

PROFESSOR NEVEN: Yes, exactly. I was going to correct that because indeed, all together in the AS/400 data, you have about 90,000 observations, and then you have, I do not remember exactly the number of observations that you have before, but I think it is around 20,000 all together, Euro 1 as well as Euro 2. Okay?

When you introduce emission standard fixed effects, that is something we will discuss later, but when you introduce emission standard fixed effects, the infringement is estimated only on Euro 2 trucks; okay?

MR RIDYARD: Yes.

PROFESSOR NEVEN: So it is basically estimated by comparing the prices of Euro 2 trucks before and after. If you look at that, I mean, all together it is 5,000 trucks. So you basically have 5,000 usable trucks in the before period in order to estimate the effect of the infringement, and you do that in an environment in which your cost is not very good.

MR RIDYARD: Yes. Mr Har -- oh sorry. I was just going to get Mr Harvey's take on that same topic.

MR HARVEY: Yes, I think I agree. There is not really a -- although it would be fantastic if there was -- a threshold at which you could say you have too little or too few observations. So from my perspective, what you need to do is you have to conduct the analysis, look at the statistical properties of the model that you have produced and satisfy yourself that it is robust, that you do have, as Professor Neven has indicated, sort of sufficient information variation in the data, and obviously I have explained why I think we do. In an alternative, would it be better to have even more? Maybe, but I do not think that thousands of observations of itself means that data is unreliable and cannot be used for comparison.

THE CHAIRMAN: Can I just ask a question, Professor Neven. You have a number of times now separated out the infringement period to the early part, where it was conducted through the headquarters, and then you suggest that the later period was just within the German subsidiaries. I am not sure of the factual basis for that assertion, but given that that seems to be the way that you are approaching it, does that affect whether it is appropriate to conduct a before/during or, as you did, a before/during/after effect, given that there were those separations, in your mind at least, within the infringement period?

PROFESSOR NEVEN: Okay. No, as I said, I just observed that there was a difference and I have no particular prior as to whether the effect should be stronger in the second part of the infringement relative to the first one, and I think Mr Harvey agrees with that. I think that he said the same. So we do not have a clear prior.

At the same time, having an additional counterfactual is useful in order to test that, and both Mr Harvey and I can test it. I mean, he can test it because he is using a before/during and he can estimate a specific effect that is associated with the beginning of the infringement, and then he is estimating a during after and he is estimating the effect of the infringement from its termination. So he can estimate two specific effects, and indeed he gets very different effects; okay? I mean, he gets sort of 14% in the other -- not 14, but 12% in the first period, and he gets a much lower effect in the second period.

Now, I can also do it because what happens is that I can compare the effect of the infringement that I estimate if I am using the during/after only with the effect that I am estimating if I am using both counterfactuals. So if indeed it was the case that the effect of the infringement at the beginning was very different from the effect of the infringement at its termination, then the coefficient of the infringement, the effect of the infringement that I estimate from the during/after model would be very different from what I estimate from the before/during/after model. So we can both see whether there was a difference between the effect at the beginning and the effect at the termination. He does it directly, because he estimates two different coefficients, and I can infer it by looking at the difference in my estimates.

THE CHAIRMAN: Do you want to say anything else, Mr Harvey?

MR HARVEY: No, I do not.

MR RIDYARD: I think that is probably all we wanted to ask you about on this topic, topic 1. Are there any clarification questions from the counsel?

MR BEARD: I have two that might be -- I am so sorry.

THE CHAIRMAN: Mr Ward, is that you trying to say something?

MR WARD: Only to confirm I do not have any questions. Thank you.

THE CHAIRMAN: Thank you, Mr Ward.

MR BEARD: I only have two that may or may not be of assistance.

The first was actually going back to a point about the variability of exchange rates and why that is significant, because the chairman referred to overtime things smoothing out. But, without in any way wanting to lead, I think the position of both experts is that it is actually variability in data that can be important in relation to econometric analysis. I just wondered whether it was worth just both experts spelling that out, why the variability matters for what you are doing with the econometric tools that you are using? It is an open question for both of you.

It may be something we come back to on exchange rates, but I think it may be instructive, just given some of the questions that were raised.

I do not know if Mr Harvey wanted to start?

MR HARVEY: Yes, so the reason -- putting to one side exchange rates -- the reason why variability matters in an econometric analysis and in a sense why it is, as it were, sort of prioritised over a number of data points that you have is, it is that that is providing information about the relationship between prices and other factors. So when you have more variability, you can observe -- you are better able, rather, to work out what happens to prices when, say, costs change and that is -- it is where the information is in the data.

PROFESSOR NEVEN: There is no disagreement. The more variation in the data, the better position you are in in order to identify the effect of the variable. I mean, if you have, say, a variable -- if cost was never changing, you would never estimate the impact on cost on prices, so you need to have variation in costs in order to see how costs affect prices.

Similarly, with respect to the exchange rate, I mean, if you just had one event, it is not great because you just had one change in the exchange rate, which is essentially what you have in the AS/400 period with the appreciation of the pound. If you are looking at the entire sample, you have variations.

MR BEARD: Thank you.

The other questions that I had were really -- because this is not a memory test, if we go to {E/62/29}, because there has been lots of reference to coefficients, E/62, page 29. It is table 1 in Professor Neven's supplemental report, but it is actually an extension of a table that Mr Harvey had in one of his reports. I just wanted to check -- supplemental, page 29, I think it is up on the screen.

There are various references to coefficients and I think these are the coefficients that have been referred to in the discussions earlier, and I just wanted to confirm that, because it may be useful for the tribunal to have that as a point of just reference. I am not talking about whether or not they are right or wrong at this point, but I think that is correct.

Is that correct, Professor Neven?

PROFESSOR NEVEN: Well, table 1 here refers to an estimation of Mr Harvey's report, so it is not the estimation that I was referring to in my own model, which is in an annex of my first report. But this is indeed a reference to the estimation of the cost coefficient, is Mr Harvey's specifications with different assumptions about the technical characteristics and the type of cost data.

MR BEARD: Yes.

I think, Mr Harvey, you recognise that.

MR HARVEY: Yes, these are -- these are ... correct.

MR BEARD: If we turn three pages back to page 26 {E/62/26}. Again, I do not think there is any dispute about this, but there was reference early on in the transcript to options and the options composition.

This is, again, in your report, Professor Neven. Can you just explain what this figure is showing?

PROFESSOR NEVEN: Okay. What you have on the horizontal axis is time. What you have on the vertical axis is the share of the list price which is accounted for by the options. You see that this share is actually changing markedly before and after the beginning of the infringement. So you see that before the infringement, it is quite small. You see that after the beginning of the infringement, it changes markedly. This is indicating that there may be indeed an issue with respect to truck mix that cannot be controlled for, because you see that after the beginning of the infringement, I mean, trucks have on average more options, and so the issue of the average cost not being a good reflection of the specific truck cost is going to be more of an issue.

MR RIDYARD: This is just based on a count of the number of options?

PROFESSOR NEVEN: No, this is from the list prices. So I have list prices for the truck and I can find out what is the share of the list prices that is actually accounted for by the options.

MR RIDYARD: I see.
MR BEARD: Yes. In fact, I think, if you look at the note, it may be a data set that Mr Harvey may have (inaudible) in relation to these matters, that has been analysed.
THE CHAIRMAN: What is "DLP"?
PROFESSOR NEVEN: Dealer list price.
THE CHAIRMAN: Dealer list price?
PROFESSOR NEVEN: Yes.
MR BEARD: It is just finding a ratio. I just thought, since there had been a discussion of these matters, rather than leaving it abstract, it was worth having the tribunal see that.
THE CHAIRMAN: Yes. Fine.
MR BEARD: Thank you. Those are ...
THE CHAIRMAN: Thank you.
MR RIDYARD: Okay, let us move on to the next topic which is looking at the -- actually something which is not really in either of your reports, but something which we thought was nevertheless interesting, and that is the fact that both of you, in your work, you have relied on looking at the average price of DAF Trucks across the piece, whereas what interested us in this particular section was whether that -- there was average prices and average price effects, which may or may not exist with the cartel period, whether they are representative of

what happened to the prices paid by the two claimants in this particular case.

The first question I will ask, which is not actually on the list really, that is can you both comment on why you decided to focus on the average price of all trucks, rather than specifically the trucks that were bought by the claimants?

Professor Neven?

PROFESSOR NEVEN: Yes. Just to clarify one thing, I am not looking at average prices; I am looking at individual transaction prices.

MR RIDYARD: Understood.

PROFESSOR NEVEN: So every data point --

MR RIDYARD: Yes, understood.

PROFESSOR NEVEN: (Overspeaking - inaudible) transaction price.

MR RIDYARD: Yes.

PROFESSOR NEVEN: But nonetheless, as you point out, I am not looking specifically at the transaction prices for the trucks that were purchased by Royal Mail and BT. The reason is that there is simply not enough variability in that data. I mean, this data set, it is not that it is too small, as we discussed earlier, it is not a matter of observation -- it is not the number of observations that matters, but what matters is variability.

One of the particular issues, I think the decisive issue probably, for not using that data set is that we do not have observations every year. So there is discontinuity in that data set, because Royal Mail and BT have not brought trucks every year. So it is important to have variability, I mean, such that you have observations throughout the period every year. So that is the main reason why I do not think that using that data set is appropriate.

MR RIDYARD: Mr Harvey?

MR HARVEY: That is one of the reasons that I had too. The other reason is that I did not have a reason to believe that the overcharge to Royal Mail/BT would be systematically higher or lower to everyone else for some of the reasons I think that we discussed last week.

What I did investigate by way of a sensitivity test was to examine whether the infringement effect in the data would be higher or lower if I tried to estimate a Royal Mail or BT specific uplift. So I am happy to discuss the results of those.

But, fundamentally, the start point was very similar, that the broader UK market-wide data set contains information that is useful for identifying the effect and no reason to believe that the effect would be

different for Royal Mail or BT.
MR RIDYARD: When you did the specific BT/Royal Mail effects, you presumably did not get a significant result because you did not have enough data to do it?
MR HARVEY: No, perhaps we -- shall I take you to it?
MR RIDYARD: Yes, please.
MR HARVEY: They are in {E/IC2}, it is the annex to the first report. Okay. The first page to look at is the {E/IC2/78}. Yes, table 10, so perhaps we can show a little bit more of -- yes. It is the last columns, two columns of that table.
So, broadly speaking, the first -- let me take you through this. The first column that is entitled "Before-during", you will see that it has an implied overcharge of 11.6%, which is, if you like, the starting model. Then, if you read across to the last two columns, you will see that the implied overcharges are larger. Above those figures, Mr Ridyard, are the coefficient estimates and the statistical significance of them. So what that is saying is that, in the before/during model, the uplift that is associated with trucks sold to Royal Mail during the infringement period is larger for Royal Mail and for BT than it is on average in the sample. So it is saying that there is a larger uplift. I will come back to explain the

interpretation of these in a moment and why I did not include them in the -- as a central estimate.

That is the before/during model.

In the during/after model, the equivalent -- yes, the equivalent table is table 13, which is on {E/IC2/83}. So, again, the first column with figures in it shows, if you like, the standard overcharge, the 6.7. Then, the next two columns after that show the Royal Mail and BT specific overcharge. You will see there that the differences between the figures and the standard figure are smaller than in the before/during model, but they are lower. They go from 6.7 to 5.8, and from 6.7 to 4.6 in the case of BT. So the answer -- sorry, the answer to your question is they are statistically significant in this model, but you can see that the effect goes one way in the before/during and it goes the other way in the during/after. I was left with a sort of interpretation question and a "How much weight to attach question?", the "Am I right?" questions that I spoke about earlier in some respects. On this occasion, I went back to the prior: is there good reason to believe that Royal Mail or BT would have an underlying higher or lower overcharge estimate? I do not know, but I could not point to one.

Also, as Professor Neven has indicated, I felt that it was best to attach weight to the pool of data that we had across the country as a whole because you benefit from the variation. So, on this occasion, I decided not to include these as my central estimates, but that is what the data shows.

MR RIDYARD: Professor Neven, can you comment on these?

PROFESSOR NEVEN: Yes, I would just like to make two comments. The first one is a general warning about giving too much attention to these coefficients in specifications which, as we are going to discuss in the next couple of days, are subject to significant identification issues. So I think that looking at the difference between the infringement in general and the infringement with respect to BT and Royal Mail in a model in which I think the infringement is not properly identified, I think is a dangerous exercise, so I think we should be very careful about this.

The second observation has to do with the prior. I have been sort of wondering about this prior for some time, and the question really is: do you expect that this infringement would have affected large customers, like Royal Mail and BT, more or less than other customers? I think that the intuition of most economists is that, you know, the infringement probably would have affected Royal Mail and BT less, and the intuition is -- I think the common intuition is that these customers have more bargaining power and possibly the fact that there was this infringement did not really significantly change the extent to which they could exercise this bargaining power.

Now, it is a soft intuition, and I was not personally very comfortable with that intuition. I think that there is, however, in terms of theory, some support for the idea that large customers that have bargaining power are less affected. It took me some time to convince myself of this, but I think that it is useful to think about a situation in which a bargaining -- sorry, a customer has a lot of bargaining power as a situation in which the customer is in the position to make a take it or leave it offer, and a situation in which a manufacturer has a lot of bargaining power is a situation in which the manufacturer is essentially making the take it or leave it offer. So that the bargaining power is measured by, you know, the frequency or the probability that it is really the customer that is in the position to make a take it or leave it offer. If you think about bargaining power in those terms, then, if indeed we are in the situation in which Royal Mail and BT were in the position to really make the take it or leave it offer, then actually coordination does not matter, because they make it take it or leave it offer, I mean, always at a level that would be close to the competitive level.

So all what I want to say here is that, even though this is a delicate argument, I think that there are different ways of thinking about it in theoretical terms. I think that one can build an argument that customers with a lot of bargaining power are less affected by the infringement.

THE CHAIRMAN: Do you deal with this in your reports?

PROFESSOR NEVEN: I do not, no. I have not discussed that in the report, because I have not focused the report on this aspect.

THE CHAIRMAN: But you obviously included the Royal Mail and BT contracts in your overall analysis --

PROFESSOR NEVEN: Yes.

THE CHAIRMAN: -- as part of the analysis of the UK-wide data.

PROFESSOR NEVEN: Yes, indeed, but what I am explaining now is economic reasoning that I am putting forward in order to try to inform my prior, okay? Mr Harvey is suggesting that he has no prior. I think that I might have a prior suggesting that Royal Mail and BT are less affected but, empirically, for the same reason as

Mr Harvey, I do not think that you can estimate this. I do not think the data allows us to estimate whether there is a BT or Royal Mail specific effect.

THE CHAIRMAN: So from an economic point of view, you think it is sensible to look at the UK-wide data for the purposes of estimating an overcharge if it exists?

PROFESSOR NEVEN: Yes, that is right.

THE CHAIRMAN: So therefore, whatever that comes out at, you would say it is sensible to say that that would have applied to Royal Mail and BT as well?

PROFESSOR NEVEN: The thing is that I cannot do anything else because the data does not allow me to do anything else. So there is a separate question of what I can do empirically and, empirically, I do not think I can do anything else. The data does not allow me to do anything else.

Whether you are asking me as an economist, do I think that I have a prior that Royal Mail and BT may be less affected, what I am saying is that, yes, there may be reasons but there is no way I can validate or invalidate these reasons in the context of this data.

MR RIDYARD: Mr Harvey.

MR HARVEY: Just briefly. The reason I do not have a prior is I think it is relatively straightforward to make the opposite claim, that, you know, imagine you have one customer that is not good at buying and does not avail themselves of competition, then you might expect for that type of customer that the effect of the infringement might be more limited than for the type of customer that tries really hard to avail themselves of competition and then their opportunity to do that is reduced by the cartel.

So I think that is why I am a bit more ambivalent as to what the prior would be than perhaps Professor Neven is, because I can see the argument the other way around. Where I think we are in the same place is the utility of using the UK data; so perhaps for the purposes of this discussion it does not matter too much, but to clarify.

MR RIDYARD: Okay. It is useful nonetheless just to have explored that.

If you look to see what you have actually done in the analysis, Mr Harvey, you do at least have a control in your regressions for which channel the sales went through and, if I read that right, it shows that the prices were something like just under 20% higher for the direct sales channel than for the dealer channel. Is that right and can you just comment on that particular feature of the data?

MR HARVEY: Yes. So I think -- I recall that the estimated effect for the dealer channel varies in the before/during and the during/after, for clarification. In terms of the figure being higher, what I think we are measuring is the price that the dealer pays to -- obviously the dealer pays to DAF, and so the way that I thought about that or one way of rationalising what we observe is, in a sense, when DAF makes a direct sale, it is undertaking perhaps some of the functions that the dealer would otherwise undertake. So although I can see sort of intuitively you might think, well, a direct sale might drive a harder bargain, as it were, I think part of what is going on is that, yes, it is kind of you have got the different parties in the supply chain undertaking different activities.

One further point of clarification that I think is important for the interpretation of that data is that in the data we see direct sales identified and dealer sales identified. Within the dealer sales, there are fleet sales but we cannot see them in the data and so you might think that some of the fleet sales have perhaps something more in common with the direct sales, so that is just important in terms of the interpretation of those figures.

PROFESSOR NEVEN: Can I just comment on this? I think indeed what we observed in Mr Harvey's estimate is that there is a positive premium for direct sales only in the

AS/400 period, but not in the MI period. So in the MI period, we have the opposite actually. We have that the direct sales are of a negative premium, they tend to be lower. Then you start wondering, you know, can that shift in the coefficient possibly be associated with something else? I think that what comes to mind is, again, the possibility of truck mix in the AS/400 data.

I mean, to the extent that the direct sales were associated, for instance, with trucks that were better endowed with more options, with different characteristics that cannot be controlled by the truck characteristics or the average cost data, it could explain why you get this positive coefficient for direct sales in the AS/400 data and you do not have it in the MI data, because in the MI data you have a better cost measure. You can control for these characteristics of the truck and you get what is possibly a more intuitive coefficient. That means you have lower prices for direct sales. So I think that one should not attach too much significance to this. I think this is something which is likely to be driven by the quality of the data.

One thing that comes to mind, for instance, is the body. I mean, we do not have data on the bodies for the AS/400 data. If customers like Morrison -- not necessarily Morrison -- but if customers buy direct with more bodies, this will be reflected in a higher coefficient in direct sales.

So I would not sort of pay too much attention to that. But at the end of the day, it does not matter all that much because, at least in my estimates, the coefficient of the infringement does not affect the identification. It does not seem to affect the identification in a significant way. So ...

MR RIDYARD: How about the evidence on margins over time? Is there anything in the margins over time -- so once you strip the cost factor out -- that is informative about the distinction between direct sales and dealer sales? Mr Harvey.

MR HARVEY: That is not something I have examined.

MR RIDYARD: Okay.

The next question really is just to understand which price data you are using for the Royal Mail and BT contracts within the wider analysis that you have done, because we have seen that we have these kind of large contracts in most of the truck purchases by the two claimants. So how do they feature in the price data?

MR HARVEY: In terms of the fixed price and large contracts, how they would show up? So what we observe in the data is the price that was paid at the time of the order and so, if a contract was set in, say for the sake of argument, 1997 and that contract was in place for the next three years and the price did not change over those three years, what we would see in the data is when an order is made under that contract, it would appear in the data at that price at whatever time the order was made.

Then, in terms of the other -- if you like, the other bits of the data that matter, that price would then be paired up with the cost of that truck but at the point in time the order was made rather than the point in time the contract was agreed.

PROFESSOR NEVEN: Now, if I may comment on this, I think that I agree with Mr Harvey's point on the data. I mean, the data that we have are the invoice price at the time at which the purchase was made and we of course have the truck that corresponds -- sorry, the cost that corresponds to that particular truck.

Now, I guess what might be a concern, if you think that we are mixing prices that vary transaction by transaction with brackets of prices that are essentially fixed because they are part of a contract -- I think that is the question.

MR RIDYARD: Yes, that is what is behind the question.

PROFESSOR NEVEN: Exactly, that is what is behind your question.

Now, I think the answer to that is that, first, there is an answer in terms of the observation that we have because, in the context of Royal Mail purchases, not all trucks are the same. I mean, they may be part of the contract but if you have seen this contract, there are menus. So actually, when they actually make the purchase, they will change different characteristics, different options. There may be different bodies. So actually you do not have exactly, you know, the same price for different trucks as part of the same contract. There is still some variability in the price that is useful and, of course, there is a variability in the cost because these trucks will have different characteristics so there will be variation.

But, I mean, Mr Ridyard is right that there is a common element because there was a common element in terms of the negotiations. Even though these prices still vary, which is good for identification, there is still a common element.

Now, unfortunately again, there is not much we can do about this. What, however, is I think an important observation is that these sales under contracts account for a very small share of the observations. I mean, we know that the dealer sales account for about 92.5% of the observations. I mean, these contracts is a share of that. I do not know what exactly is the percentage but it is less than 7% and there are only five customers that have contracts. I mean, it is BT, it is Royal Mail, it is Morrison, it is Her Majesty's Prison Services and it is the defence department. So, you know, it is a small problem. I mean, I do not think this is likely to affect the identification of the infringement.

MR HARVEY: I think I am broadly in the same place. I think I can develop a couple of points. One is potential concern that fixed price contracts are just on average cheaper or more expensive and there are more or less of them that appear in the infringement period than before or after it. We do not know. We do not know. Perhaps the dealer control that I spoke about earlier would account for some of that potentially.

The second point about the sort of matching up of the data, I thought a little bit about that which was that in a sense what we have is a contract price, a contract price set at an earlier point in time, and then what we have to do is pair up the price of that truck with a cost after the point at which the truck price has been set, and we have to do that with other variables as well, things like the demand variable. We have to say, well, the demand variable at the time of selling the truck is the relevant variable to pair the truck price with.

There is an argument that ideally what you would do is almost pair up the price of the truck with sort of the expectation of what the cost of that truck would be in the future or what the market condition would be in the future. Of course we cannot do that because we could not possibly know.

Intuitively, I think the consequence of that would be that those factors that vary over time, the relationship between those factors and price would probably be dampened somewhat. So put another way, what I have got is a price that is flat and I am pairing that with a cost that varies so I do not see a relationship between the two, whereas actually what is underlying the data is an expectation that, when I set that contract price, I am taking account of the future cost that I am likely to incur and that would potentially provide a stronger relationship between those variables.

So my intuition is, although I agree with Professor Neven on materiality, my intuition is that perhaps the measurement of those variables would be -- the effect of those variables, demand and cost, would be dampened slightly as a consequence of this. But I cannot think of anything that we could do to address that in this data without making rather heroic assumptions about what was going through the minds of the people in the negotiation at the time of agreeing the price.

MR RIDYARD: As you say, it is probably not really worth the effort given where these transactions fall relative to the --

MR HARVEY: I think so.

MR RIDYARD: There is a later question in the exchange rate section about the fact that these -- the exchange rate risk was hedged, as we understand it, on these long-term contracts but I guess that would just feed into -- really the answer you just gave would apply equally to that particular issue?

MR HARVEY: Yes, I think it would depend on your expectation of the future --

MR RIDYARD: Yes, okay.

Before we leave this topic on the difference between the generality of DAF's truck prices in the UK and the specifics of the prices that were paid by the claimants, is there anything else -- are there any other sort of mix effects or composition effects that we ought to be aware of or thinking about before we just happily take the UK-wide overcharge estimate as being an estimate of what impact it had on the claimants?

I can see neither of you is that keen to go first on this but, Professor Neven, any thoughts?
PROFESSOR NEVEN: No, I -- you know, Mr Harvey is also using a customer size fixed effect. Again, it does not seem to matter for the identification and I am worried about using that variable because I do not think it is measured properly. Actually, in my own sensitivities, I have used the variable that has been created by Mr Harvey. I have not used -- I have not created my own variable and that is because, I mean, in order to measure customer size, you need to be able to identify the customer. But, of course, what we have for 92% of the observations are dealer sales so we do not necessarily know who is the final customer. Sometimes it is in the data, sometimes it is not. Sometimes it is misspelt. I mean, sometimes actually you have a different name for what may turn out to be the same customer, or the other way around.
So I think that this data is potentially quite noisy and, you know, I have done a sensitivity in which I include this customer size variable which has been created by Mr Harvey. It does not seem to matter but I would be concerned about relying too much on this information.
MR RIDYARD: Thank you.

MR HARVEY: I cannot think of any other mix effects. On the point about -- are you referring to -- sorry, are you referring to order size?

PROFESSOR NEVEN: Order size.

MR HARVEY: Order size, yes, so I think the motivation there was to include something that would potentially be a proxy for the scale of the -- it is true -- the scale of the customer or significance of the customer. We cannot do that because of difficulties that Professor Neven has outlined.

So instead, the way we thought about it was, well, what we do observe is, if you like, the size of the transaction at a point in time and we have included that to control for that element of customer mix. So I think I would agree it is imperfect but it seems to me it is quite a sensible measure to use under the circumstances. But I cannot think of any other mix effects that would concern me at this point.

MR RIDYARD: Just to be clear, neither this order size nor the sales channel thing was a big feature of your results, Mr Harvey, in the end?

MR HARVEY: In the end there are other factors that appear to be much more important, like what the truck is.

MR RIDYARD: Yes.

MR HARVEY: So, yes, in this case it did not matter too much.

MR RIDYARD: Right. I think that has killed off that topic.

THE CHAIRMAN: Is there any clarification?

MR BEARD: Not from our end.

THE CHAIRMAN: Mr Ward, do you have any questions?

MR WARD: No, I have not. Thank you very much.

THE CHAIRMAN: Thank you. All right. Well, that is conveniently timed. I think we should probably break for lunch now. Of course you are both under oath. I do not know whether that means you can speak to each other.

MR BEARD: We take the view that they could.

THE CHAIRMAN: You can go out for lunch together if you like but make sure you do not speak to your teams.

MR HARVEY: We had a pleasant chat but not about the case.

THE CHAIRMAN: All right. We will resume at 2 o'clock. Thank you.

(12.56 pm)

(The short adjournment)

(2.00 pm)

THE CHAIRMAN: Good afternoon.

MR RIDYARD: So we are now moving on to the topic of exchange rate effects and how that is dealt with in the overcharge estimates.

Our first question, it would just be useful if the experts could just summarise why the exchange rate effects matters for the overcharge estimates.

Mr Harvey, maybe you could just go first on that.

MR HARVEY: During the infringement period, the pound was strong relative to what it was before and after it, so that means that for every pound of sales, other things equal, DAF would receive greater income in euros. So the question becomes to what extent would it cut its price to give a lower pounds price.

If we overestimate how much that price would be cut, we would overestimate the overcharge, and equally, if we did it the other way around, we would underestimate it. That is why it matters.

MR RIDYARD: Professor Neven?

PROFESSOR NEVEN: Yes, I think it is important to control for the exchange rate because you would expect indeed the exchange rate to affect the prices in pounds. I mean, as I explained earlier this morning, if there is an appreciation of the pound, it means that the euro depreciates, it means that DAF is becoming more competitive, so you would expect that DAF would actually reduce its prices in pounds. I mean, and the other way around, if there is a depreciation of the pound, it means that the euro appreciates, DAF is becoming less competitive, so you would expect again to have an adjustment in the price in pounds in the opposite direction; the price in pounds should be increased.

So when these changes in the exchange rate, which affect the prices in pounds, are happening more or less at the same time as the infringement, and, as we have explained earlier, for the beginning of the infringement we have at the same time a sharp appreciation of the pound and we have the beginning of the infringement. So we know that the infringement -- that is what we are trying to capture, the extent to which the infringement leads to an increase in prices in pounds. We understand that an appreciation of the pound taking place at the same time would also affect the price in pounds. So we need to control for it.

Now, there is something which is important to realise, is that if you do not control for it at all, actually the appreciation of the pound will lead to a bias of the estimate of the infringement which is downwards. Because what happens is, when the pound appreciates, it means that you would expect, because DAF is becoming more competitive, you would expect the prices in pounds to go down, which means that if you are not controlling for the appreciation of the pound -- I mean, you are going to measure the effect of the infringement by comparing the observed prices with the prices before, without taking into account the fact that if there had not been the appreciation of the pound, the prices would be higher; okay?

THE CHAIRMAN: Yes.

PROFESSOR NEVEN: So if you do not take into account the effect of the exchange rate, you would actually have a bias of the estimate of the infringement which is downwards.

This is important to keep this in mind to understand, I mean, the discussion we are going to have later about why an estimation in euros actually leads to the opposite bias, which is the -- an upward bias in the estimate of the infringement.

MR RIDYARD: But behind that statement there is an assumption that you are looking at the whole thing in pounds.

PROFESSOR NEVEN: Of course. That is right. I think it is -- indeed, you can see it as an assumption, but I think that is the question that is being asked, yes.

THE CHAIRMAN: Is there also an assumption that DAF did actually increase or decrease its prices dependent on the exchange rate?

PROFESSOR NEVEN: This is for the data to say. I mean, I think that you would expect firms that are faced with a change in the exchange rate to change their prices. The question is by how much and that is for the data to

say.
THE CHAIRMAN: It would be the same for all the truck manufacturers because they all have a similar problem?
PROFESSOR NEVEN: Yes. They all have a similar problem. Of course, they do not have exactly the same problem, because, you know, DAF, unlike others, is producing some of its trucks in the UK with a higher UK content, and this particular feature of DAF, as we are going to discuss this afternoon, is actually useful in order to identify the effect of the exchange rate.
THE CHAIRMAN: Because some of the costs --
PROFESSOR NEVEN: Is in pounds.
THE CHAIRMAN: -- were actually in pounds?
PROFESSOR NEVEN: Exactly, yes.
MR RIDYARD: Can you just remind us what the pound cost -- how important the pound costs are in relation to total costs of --
PROFESSOR NEVEN: Of course, it varies across the different types of trucks. These are -- the LF trucks are being produced in the UK, and some of the CF trucks -- over time actually proposed to exchange -- some of the CF trucks have also been produced in the UK. Of course, if you are producing in the UK, you have a higher content of pound cost, pound incurred in cost, like labour cost and so forth. This variation across trucks in the pound

component of cost is going to be important for our identification strategy. But to answer your question, the pound share on average is around 25%.

MR RIDYARD: Of total costs?

PROFESSOR NEVEN: Of the MLO.

MR RIDYARD: The MLO, yes.

PROFESSOR NEVEN: Yes.

MR HARVEY: That is in the MI period, is it not?

PROFESSOR NEVEN: Yes.

MR HARVEY: Yes.

PROFESSOR NEVEN: That is right. In the MI period, you are right. Because before, we do not know; okay? That is one of the problems with the AS/400, is that we do not know what is the split between the pound cost and the -- the cost incurred in pounds, sorry, and the cost incurred in euros.

MR RIDYARD: Sorry, Mr Harvey, I will return to you in a moment.

But that 25% is across all truck types?

PROFESSOR NEVEN: Yes.

MR RIDYARD: So how does it differ as between the --

PROFESSOR NEVEN: Actually there is a difference because, as I say, the LF are produced in the UK and there is a higher proportion for the LF trucks. Out of memory, but -- you know, here I should not be quoting out of memory, but I think for LF trucks it can go to 40%.

But, I mean, still for the LF trucks, there is still an important share that is incurred in euro because of imported components that are imported from the continent.

MR RIDYARD: Mr Harvey, any observations or comments on that?

MR HARVEY: No.

MR RIDYARD: Okay.

A question for Mr Harvey really. When we come to your analysis, we know that you have done your analysis in euros, so converting to euros, and this is sort of jumping straight in, in a way, but let us try to do that. Why is it not feasible to have an exchange rate term in your equation, given your approach to the analysis? Why is it not feasible to have an exchange rate term in there to measure whether there is something going on with exchange rates independently of what is going on with prices?

MR HARVEY: Yes, so the first thing, in terms of the exchange rate term, the exchange rate does feature in my analysis through the cost variable, but I think, if I have understood the question correctly, you are referring to the possibility of including a separate exchange rate control.

MR RIDYARD: Yes, and in answering this question, feel free to step back and give us some context on how you set your model up as regards exchange rates.

MR HARVEY: So in terms of feasibility, really during this period, so, when I say this period, 1997 through to the post-cartel period, there were sort of what you might describe as step changes in the exchange rate.

So there is a relatively low exchange rate that is in the period 1994 through to 199 -- just before the start of 1997.

THE CHAIRMAN: When you say "low" --

MR HARVEY: I mean the pound was relatively weak, yes.

Then you see the pound strengthening quite considerably, really right until the global financial crisis when it weakened again. Then there is a period after the cartel where, relatively speaking, the pound is weaker.

So the problem that that creates for the econometric modelling is that essentially the step changes in the exchange rate coincide, broadly speaking, with the infringement starting and the infringement stopping, and so that is why it is difficult to disentangle the effect of the exchange rate moving and the infringement starting and stopping. So that is the sort of challenge that we face. We will have a discussion, I think, about the relevance of that challenge to each of our analyses. My view is that it is a feature of the data and the facts that the exchange rate appreciated in that step change way and it affects both of the analyses that we do in a similar way.

I can carry on to talk about my modelling, but I am conscious that comes later so ...

SIR IAIN MCMILLAN: Could I just ask one question, if I may, please, and that is that we heard in evidence to the panel earlier that, on long-term contracts, DAF locked in the exchange rate by hedging through the purchase of forward contracts, both, you know, to derisk the internal transfer pricing, but also to derisk the agreed purchase price. I wonder to what extent you took that into account in the work that you have done?

MR HARVEY: So there are not any sort of controls or anything like that for whether a contract is hedged or not. I believe, but I have forgotten the reference, we were actually I think told in one of the -- I think it may have been annex 1 to a disclosure statement, I think, that actually hedging did not affect their pricing decisions. This is from DAF.

Now, from a --

THE CHAIRMAN: I wonder whether ...

MR HARVEY: Sorry, I do not have the reference before me.

MR LASK: Sorry, sir, if it is a reference that is needed, it is {H/IC56}.

MR HARVEY: But I suppose two observations in respect of what is written down there. From an economics perspective, there is obviously a risk associated with the exchange rate, the exchange rate movement, and the firm has decisions as to whether it, in a sense, bears that risk, and you would expect it to want to essentially price that indirectly, or whether it incurs effectively a cost of hedging and sort of price it in that way.

So it is not immediately obvious to me that that would have a direct bearing actually on the pricing -- the pricing analysis itself. So I think it is more an issue that the risk exists rather than how it is managed for our analysis.

PROFESSOR NEVEN: Can I just comment on this? My understanding is slightly different from yours, and maybe it is a matter of going to the record here, because my understanding is that they did not hedge. That is to say that when they had forward, sort of, contracts, they did not actually buy options. All that they did is that whenever they recorded a sale, they actually sold the pound forward. That is to say they had a forward contract, a forward sale if you want.

So if, I mean, they record a sale in pound today and this sale is actually going to lead to a cash flow of pounds in six months, then they sell the pound forward; okay? So they basically have a contract such that they sell the pound forward to have, in euro, the amount that they can compute today.

SIR IAIN MCMILLAN: That is my understanding and the basis of my question. Did that have any impact on the work that you carried out?

PROFESSOR NEVEN: No, but that is not hedging actually. I mean, this is simply buying a forward contract in order to protect yourself against the change in the value of the currency between the time at which you make the sale, which is not the time of the contract, which is the time at which you make the sale, and the time at which you receive the cash.

SIR IAIN MCMILLAN: Yes.

PROFESSOR NEVEN: This is simply selling forward. This is not really buying an option, which they could have done and they apparently did not do.

THE CHAIRMAN: So it is just locking in the --

PROFESSOR NEVEN: It is just locking in, that is it. They could have done something much more sophisticated which would have been, when they entered into a contract with, say, Royal Mail, they could have said, here, there is a price that is committed for a certain period of time, typically one year, in some circumstances two years, so I know that if Royal Mail is buying trucks from me, I am committed to a price and I want to buy protection against that, but this they did not do.

SIR IAIN MCMILLAN: No, I understand that. It did appear in the written evidence and one of our witnesses -- it is in the transcript. The question for you is: did you take that into account? But there may have been no need for you to take it into account and I think that is what you are --

PROFESSOR NEVEN: That is what I am trying to say. That is what I am trying to say, is that there is no need to take it into account because all what they were doing is just, you know, to protect themselves against the change in the exchange rate between the time of the sales and the time of receiving the cash.

SIR IAIN MCMILLAN: Thank you. Thank you.

MR RIDYARD: I am conscious that we have slightly skated over a question about the inclusion of an independent term -- exchange rate term in the equations, but I think it would make more sense to bring that in actually in a couple of questions' time when we talk more generally about your framework, Mr Harvey.

Before we get there, can we just go back to the question of comparing DAF's position with that of other truck suppliers and actually comparing DAF's position on the LF trucks and CF trucks, which is obviously of interest too, given that the position is asymmetric between the two.

First of all, as between DAF and the other suppliers of trucks, would we expect any different approach to how they approached the sales in the UK market from one to the other and how does that affect our understanding of how exchange rate effects might get passed through to prices in pounds for UK sales?

Mr Harvey, maybe you can go first on that.

MR HARVEY: The way I thought about this was that from -- so DAF obviously is competing with other euro exporters, but it is different in the sense that it has this local part of production. So when the pound gets stronger, DAF's costs rise, whereas its rivals do not. Then the question is: what happens next? So that would give -- the way I thought about this was, that would give DAF an incentive to increase its prices. Now, in making that decision, it will obviously trade off the fact that it is facing a cost disadvantage that its rivals is not, but other things equal, I would expect its prices to go up.

Then there is a question about how the rivals will react to that cost increase. My intuition is that they would also therefore face an incentive to increase their prices by an amount. Where I would expect the net outcome of that would be prices would, in pounds, go up, and DAF's margins, because it faces -- has a competitive disadvantage during that period, would come under downward pressure, would probably fall, other things equal.

So I think DAF's different position has a bearing on the impact of an exchange rate change for it, but also has a bearing on the impact of an exchange rate change for others in the market, even if they do not have local costs through those mechanisms.

PROFESSOR NEVEN: Yes, I think that what this discussion highlights is that the share of the cost that is incurred in pounds, which we can actually measure at the truck level, in the MI period, is something that is very important to understand the impact of the exchange rate. Because, of course, I mean, the larger is this share of cost incurred in pounds at the truck level, the less you are affected by the exchange rate, but also, of course, the greater the potential asymmetry with the other manufacturers. Because if you have a lot of your cost base that is incurred in pounds and all the other manufacturers do not, if there is a change in the exchange rate, you are going to be in an asymmetric position. So that, I think, really reinforces the justification for having a model of the effect of the exchange rate on prices that takes into account the share of the cost incurred in pounds. There are two reasons, and of course, the first reason is that, of course, the larger is the share in pounds, the more you are protected but the less effect there is from the exchange rate on your prices, but with an additional element that comes from the asymmetry with the other manufacturers.

Now, in my model, as we are going to discuss later this afternoon, the share of cost incurred in euro in pound, is really the important component of the identification strategy. Now, you may be asking me a second order question which is: is it that in the context of my model I could see whether, in addition to the significance of the cost base incurred in pounds, I could see an effect which is stronger or weaker, depending on whether my competitors -- DAF's competitors are incurring -- are in an asymmetric position.

So you would expect that, indeed, the effect on LF trucks might actually be different from the effect on XF and CF, because a larger share of the cost of the LF trucks is incurred in pounds. In the context of one of the estimation -- one of the sensitivities that I have performed, indeed it is not reported in my report because it is an additional sensitivity that I have performed, indeed I can detect that there was a different effect on LF trucks that goes into the -- in this direction, in the direction that there is a greater asymmetry between DAF and its competitor with respect to LF trucks than with respect to the CF and the XF trucks.

MR RIDYARD: How can you measure an asymmetry between DAF and its competitors when you have not looked at competitor prices?

PROFESSOR NEVEN: All I know is that I have assumed that the asymmetry exists with respect to LF trucks, because they are produced in Leyland, and I also know that none of the competitors is producing in the UK. So I know that the asymmetry is strong for the LF trucks.

THE CHAIRMAN: Am I understanding this correctly, that what you are saying was because DAF incurred a substantial proportion of its costs in pounds, therefore if the pound strengthens, that exchange rate change would actually have less impact on DAF than other -- than its competitors.

PROFESSOR NEVEN: This is one of the factors, one of the effects that is behind what I measure, which is the effect of the exchange rate on the share of the cost that is actually affected by the exchange rate at the truck level.

THE CHAIRMAN: So we are to a certain extent assisted by the fact that DAF does incur some of its costs in pounds, because the exchange rate effect is less?

PROFESSOR NEVEN: It is essential. For my identification strategy, it is essential.

THE CHAIRMAN: But if it is less -- I think the question was about whether you needed some sort of separate control variable in the model for exchange rate.

PROFESSOR NEVEN: Yes, in my model, what happens is that I control for the exchange rate through the cost, and I know what is the share of the cost that is incurred in pounds and the share of the cost that is incurred in euro. So I model the effect of the exchange rate through the share of the cost which is actually affected by the exchange rate, which is the share of the cost incurred in euro.

THE CHAIRMAN: But all the costs are affected by the exchange rate in one way or another, are they not?

PROFESSOR NEVEN: No.

THE CHAIRMAN: It is just the pounds --

PROFESSOR NEVEN: I mean, if you --

THE CHAIRMAN: -- work one way, and the euro costs, the other?

PROFESSOR NEVEN: If you are look -- trying to understand what is the effect of the exchange rate on your prices, I mean, if you have costs that are incurred in pounds, you know, they are independent of the exchange rate; okay? I mean, it is not going to change your pricing strategy. I mean, you have costs in pounds, you have prices in pounds.

If you have costs that are incurred in euro, that is a different thing, because when expressing these costs incurred in euros into pounds, it has an effect. If the pound is depreciating, expressed in pounds, the costs incurred in euros will be bigger, I mean -- the other way around.

MR RIDYARD: So, if I am -- just to go through a thought experiment. If I am sitting in the euro zone making a product, the pound strengthens against the euro, so suddenly the UK is looking a more attractive market for me to sell at a given pound level. But if my competitors are also sitting in the euro zone with me, they are all going to say, "Oh, suddenly our euro profits are much higher when we are selling this product for £10, so why do we not sell it for £9.50 instead in order to gain share off one another?" So you would expect some -- if the costs are all being incurred in euros and the pound has appreciated against the euro, the UK, other things equal, is a more attractive place to sell stuff, so you try harder to sell and that brings the pound price down?

PROFESSOR NEVEN: Down, exactly. This is what is happening. Of course, I mean, if all the competitors are affected in the same way, I mean, you will expect that they will all, I mean, try to reduce the price in pounds.

But as I was sort of mentioning earlier, you do not expect that the full amount in your example of the appreciation of the pound is going to be passed through into reduction of prices in pounds, and that is the empirical issue. You need to estimate how much, given the competitive environment, when the pound is appreciating, the prices in pounds actually fall.

MR RIDYARD: Yes. Thank you.

But just to kind of continue with my thought experiment, you have got one producer who is unfortunate enough to be making at least, let us say, some of its products in the UK in pounds; it does not get its benefit, so it still wants to carry on charging £10, if it can, for this product.

PROFESSOR NEVEN: That is right.

MR RIDYARD: But it may be, as Mr Harvey just said, it may be forced to reduce its price because of the pressure from the guys who are incurring costs in euros --

PROFESSOR NEVEN: Yes, as I said --

MR RIDYARD: So if we then -- so that is why the LF/CF truck comparison is particularly interesting, because it allows you to follow through this thought experiment in real life, as it were, because the LF trucks, other things equal, are not getting the same benefit from the pound's appreciation as the CF trucks are.

PROFESSOR NEVEN: That is right.

MR RIDYARD: So you would expect the downward pressure in pound prices for the CF trucks to be swifter and greater than the downward pressure in pounds on the LF trucks?

PROFESSOR NEVEN: That is correct. I mean, you accept an asymmetry, which is driven by the fact that, indeed, for LF trucks, there is a greater part of the cost that is not affected by the exchange rate.

As I said, my model is at the truck level and I control for the share of the cost that is incurred in pounds at the truck level.

Now, I think that, however, if I was you know going to -- really trying to estimate empirically what you are suggesting, I would need to have a model in which there is an additional non-linearity in which I would have in my model not only the share of costs incurred in pounds, but I would have a non-linear effect that captures what you are describing, the fact that the competitors --

that the higher the share of the cost incurred in pound, the higher is the asymmetry of the competitor, so there would be, you know, a second order effect, an additional marginal effect on the extent to which there was a price adjustment. That is something I have tried to do, I can explain later when we are looking at my estimates, and it seems to be borne out by the data, but it is difficult to estimate, of course, because, you know, it is a second order effect.

MR RIDYARD: Yes.

THE CHAIRMAN: Did you want to say something?

MR HARVEY: Yes, can I -- I just wanted to, on the thought experiment that you have just been through, it is sort of the motivation for my model. So it sort of starts from a company that is exporting trucks to the UK and is concerned with euro margins, so that is almost like the starting point for my model.

Then, in the economic literature, there are sort of two reasons why that type of company would not pass on a full movement in the exchange rate. The first reason is a sort of competitive disadvantage reason, which is, you know, it is possible that in some markets you have euro exporters and you have also a local supplier and your -- moving the exchange rate is putting you at a competitive advantage or disadvantage.

Here, we do not have that. We have a slightly different situation where it is the costs that DAF incurs, DAF incurs some local costs. That is the first reason.

The second reason is what we have just been through which is that, as an exporter into the UK, if some of my costs are locally incurred, when I am looking at those costs in euros after an exchange rate appreciation, I have become more costly, and that would also reduce the rate of exchange rate pass-through, because, put another way, really I ought to raise my euro price and that means that my pound price goes up by a bit and a bit more than the full drop, as it were, as if it had not had that cost, that cost difference.

What I have tried to do in my model is reflect those two paths. So -- and that explains why my model is not suggesting that there is a full exchange rate pass-through because it takes account of that second path, the fact that there is upward pressure on euro prices as a consequence of the exchange rate getting stronger, and that puts less downward pressure on pound prices. So that sort of thought experiment, almost you might say the euro pricing model perspective, is I think what sort of shaped my approach to the analysis; whereas I think the way that Professor Neven has described his model, it sort of starts from sort of more a UK pricing perspective where there is a cost increase seen in terms of pounds rising.

MR RIDYARD: But there is no cost increase then, is there? Because if you take a pound perspective on this whole thing, the pound has not appreciated against the pound; it is just the pound.

MR HARVEY: Well, it is the euro part of it.

MR RIDYARD: The euro has depreciated.

MR HARVEY: Yes, which would put downward pressure on the pound price.

MR RIDYARD: Downward.

THE CHAIRMAN: Are you saying that is the way you would have expected DAF to have looked at it because they were --

MR HARVEY: Yes, I am saying that, from the perspective of -- when I looked at the evidence, it seemed to me that DAF was concerned with its profitability in euros and that it obviously had mechanisms to achieve euro levels of profitability. So that was sort of -- it is not the only consideration in shaping the way you design these econometric models, but it was one of them.

MR RIDYARD: We will develop this, but the other perspective on this might be that if you are a customer in the UK, you know, you are buying trucks to do deliveries or whatever you are doing with them, you know that the pound -- you might know the pound has appreciated against the euro, but that is not necessarily affecting the prices of the things you are delivering to customers and so there might be -- obviously, if the truck manufacturers are then happy to reduce their prices to you, you are delighted about that. But there could be some stickiness before that kind of process follows through because there is not -- there is nothing screaming at you as a customer that you ought to be getting lower prices for your trucks and there is nothing in your downstream business necessarily which is being affected by this exchange rate change. So would you not expect a bit of sleepiness or stickiness in the way in which the market looks at this whole thing and follows these things through?

MR HARVEY: The way I thought about that was I think there are two related but sort of separable issues. One is, ultimately, the extent to which over time the exchange rate would feed through into prices, the levels issue. Then there is something about how quickly we would expect that to take place.

I did reflect on the criticism from Professor Neven in relation to the point about speed. I can see that, with contracts in place and so forth, that could well be delayed, and there may well be market factors that mean

I do not move straightaway and that is why I prepared that sensitivity.

On the point about the level and also speed, here, we are concerned with something that is sustained. So the difference between the two models is that in my model I am sort of detecting this sort of margin elevation, as it were, in euros that lasts really quite a long time. It is not just that it is there for a day or two or a month or two while prices readjust; it is something that is persistent in the data. So, although I do accept that these things may not happen overnight, ie rivalry will not just kick in and immediately force prices to return, as it were, to the exchange rate neutral level, I do not think that is the circumstance that we are dealing with here. We are dealing with a circumstance where, if you believe that story, it has really taken a very long time for those adjustments to take place.

MR RIDYARD: Professor Neven?

PROFESSOR NEVEN: But you are still using the current weekly exchange rate though in order to express prices into pounds into euros, so that is an immediate effect. But -- so it seems that there, you are imposing something that is immediate.

But I think that what is really important in terms of the differences in specification is that by expressing all the prices in euros -- or the pound prices, transaction prices, I mean, that were in pounds, negotiated in pounds, by expressing them in euros at the weekly exchange rate, essentially what Mr Harvey does is to impose a one to one relationship between the prices in pounds and the prices in euros. I think that is the key difference between what he does and what I am doing, is that he actually imposes this relationship.

You can see that I think particularly clearly in the third report of Mr Harvey in which he is doing further sensitivity and he is looking at a model in pounds, so prices are in pounds, and he is relating these prices in pounds to costs in euros and to pass-through effects of the exchange rate, as he calls them.

What you see in this estimation is that his estimation in euros is exactly the same as an estimation in pounds in which you impose that the coefficient on the exchange rate is equal to 1. If you think about it for a second, it is sort of obvious, because the price in euros and the price in pounds is related by the exchange rate. If you take the logarithm of the exchange rate, I mean, the logarithm or ratio is equal to the difference in logarithm, so essentially what Mr Harvey does, and I think he will not contest it, is that when you are estimating a model in euros, it is the same as estimating a model in which the prices are in pounds and in which the effect of the exchange rate is imposed to be 1.

That is the big difference between, you know, what I am doing and he is doing: he is imposing something.

Now, let me link this to the discussion that we had earlier about the problem of identification of his model. So what Mr Harvey does, as I have just explained, is that in the period, for instance, of the appreciation of the pound, I mean, you expect that when the pound appreciates, the prices in pounds will go down. As I said, you might not go down by the full amount of the appreciation of the pound, it could be intermediate. So the pound -- and actually this is what happened in that time, the pound appreciated by about 8%, in a very short period of time. Now, the prices in pound could go down possibly by 4%. What Mr Harvey imposes is that they should go down by 8%, which means that if the prices do not actually go down by the amount that he imposes, this is going to be picked up by the infringement.

I mean, if indeed the prices do not go down by the full extent, that is to say they stay higher, they stay higher than what he imposes, since this is the beginning of the infringement, this is going to be picked up by the infringement. This is why --

MR RIDYARD: That is really useful. Can I just stop you there and ask Mr Harvey immediately to respond?

Is that correct?

MR HARVEY: No.

MR RIDYARD: Why not?

MR HARVEY: So the statement is that by converting prices into euros I impose 100% exchange rate pass-through into pound prices.

That is wrong, and the reason it is wrong is this: that --

PROFESSOR NEVEN: Sorry, I did not say that. I think that I did not say that, but --

MR HARVEY: I will explain what my model does do. It may be that we have a semantic difference between us.

PROFESSOR NEVEN: It is not semantic.

MR HARVEY: The way my model works, so we have prices in euros, we have costs in euros within the model. Part of those costs in euros are the pound part of costs converted into euros, and so when the pound gets stronger, the euro cost rises, and then, because there is a relationship between prices in euros and prices in -- sorry, costs in euros, that puts upward pressure on the euro price. That is how the model works.

That upward pressure means that -- looking at that price back in pounds means that the price has not fallen by as much as it would need to fall in order to claim that there is a 100% exchange rate pass-through in my model. That is the mechanism by which it works. So I do not know whether there is a labelling issue that is going on here or what, but you do not -- econometric models do not work by -- the fact that an adjustment has been made to one of the variables does not drive the result. It depends what you do with everything else in the model. That is the mechanism that -- that is how my model works.

So I do disagree with this idea that it has imposed 100% exchange rate, exchange rate pass-through --

THE CHAIRMAN: I mean, Professor Neven, you said a one to one relationship.

PROFESSOR NEVEN: Exactly.

THE CHAIRMAN: Is that the same as 100% pass-through? Is that --

PROFESSOR NEVEN: No, that is exactly -- you are pointing your finger on exactly the distinction.

THE CHAIRMAN: Right.

PROFESSOR NEVEN: I am not saying that he is actually imposing a one to one pass-through of the exchange rate. I think what I am saying is that, if you look at this model in euros and look at what this means into a model in which you are looking at the pass-through of the prices in pounds, which is the question that we are interested in, this is a model in which he has prices in pounds, but he has the exchange rate as an explanatory variable with a coefficient that is imposed to be 1.

I think he will not disagree with that.

Now, in addition --

THE CHAIRMAN: I am not sure I understand it, but --

PROFESSOR NEVEN: Okay. It is just a logarithm. You know, if you have -- mathematically, if you have the logarithm of a price, let us say, in euro, this is equal to the logarithm of the price in pounds divided by the exchange rate. I mean, the logarithm of the ratio is equal to the difference in logarithm, which means that when you are estimating a model with prices in euros, it is the same as estimating a model with prices in pounds, but then having minus the log of the exchange rate that you bring on the other side of the equation.

So you impose the -- and actually you can look at the -- okay, you actually impose this one to one relationship.

THE CHAIRMAN: Sorry, are you saying it does not matter whether you go one way or the other? Euros to pounds or pounds to euros?

PROFESSOR NEVEN: No, no. I think it matters a great deal, because estimating a model in euros is equivalent to estimating a model in pounds in which you have imposed this effect of the exchange rate.

Now, where Mr Harvey is right is that in his model he is not only doing that, not only imposing that coefficient, he is also putting in the right-hand side the logarithm of the cost incurred in pounds but expressed in euros. So there is indeed an effect of the exchange rate in his equation. So that the two statements having a one to one relationship between prices in pounds and prices in euro is not equivalent to having a full pass-through of the exchange rate. These are not two equivalent statements precisely for the reasons that Mr Harvey has explained.

MR BEARD: Sir, can I -- I recognise that it is not -- I think there may be a confusion about prices and costs here. Mr Harvey started off his statement, it says:

"The way my model works, so we have prices in euros ... [as read]"

I wonder whether the question is, how does Mr Harvey get to the prices in euros?

THE CHAIRMAN: Well, I certainly understood him to have said that we have got to the prices in euros because you applied the exchange rate.

PROFESSOR NEVEN: Exactly -- the current exchange rate.

THE CHAIRMAN: Current exchange rate.

PROFESSOR NEVEN: The weekly exchange rate.

MR HARVEY: But what I am --

PROFESSOR NEVEN: Can I just finish my explanation?

MR HARVEY: Of course. Carry on.

PROFESSOR NEVEN: So that I think essentially what he does is to impose this coefficient on the exchange rate and then introduce indeed a variable that is affected by the exchange rate because it is the cost incurred in pounds, as he expressed, but expressed in euro at the current exchange rate. So there is also another effect of the exchange rate in his equation.

But it is a very odd effect of the exchange rate. Why? Because we are trying to explain prices in pounds, and, you know, costs incurred in pounds should not be affected by the exchange rate -- should not affect the prices in pounds. So he is actually introducing this variable, which is the cost incurred in pounds, which should not affect the prices in pounds, and he is introducing that variable, expressing this cost in pounds, which should not have an effect, into euros.

So he is right, technically. Empirically, he is right, that he is introducing this additional variable, which is the cost incurred in pounds expressed in euro, but, I mean, it is a very counter intuitive way of estimating such a model. That is the point -- the first -- second point, knowing that the first point is that he imposes something. From an econometric point of view, this is the important thing, is that he is imposing that the prices in pounds are affected as a one to one relationship with the exchange rate.

In terms of my explanation for why his model leads to a problem of identification and overestimates the effects of the infringement is that because he has this one to one relationship, he imposes that prices in pounds, at the time of this appreciation of the pound, should decrease by the full amount. If they do not, of course, the difference is going to be picked up by the exchange rate -- by the infringement.

THE CHAIRMAN: So is this complaint about using the current exchange rate, is that the problem with --

PROFESSOR NEVEN: No, I think the problem is really the imposition of this one to one relationship --

MR RIDYARD: That probably does stem from using the current exchange rate --

THE CHAIRMAN: Yes.

MR RIDYARD: -- to convert pound sales prices into euros.

PROFESSOR NEVEN: I mean, if he were to use a different exchange rate, in particular a lagged exchange rate or combination of past lagged exchange rates, then the problem will be alleviated, yes.

THE CHAIRMAN: Well, that is what you do, as I understand it?

PROFESSOR NEVEN: No, because I estimate the model in pounds --

THE CHAIRMAN: Yes, I know, it is the other way.

PROFESSOR NEVEN: -- and I do not impose anything; okay? I do not impose a coefficient. I do not impose a particular relationship. I let the model determine the impact of the exchange rate on the cost incurred in euro expressed in pounds, into prices in pounds, which is the economically sensible, you know, mechanism.

The mechanism is that you incur costs in euro, the pound appreciates. In pound terms, your cost is going down. The question is: how much do you pass that on? That is what my model captures.

MR RIDYARD: Mr Harvey, time for you to have a turn I think.

MR HARVEY: So in terms of the idea that the model is counter intuitive in terms of the way it is set up, obviously I am going to disagree with that. The way the model is designed is to say, well, okay, I have got some exporters providing their product into the UK. There is an exchange rate change that affects them all. I am asking myself the question: why, in this market, would that allow one exporter to enjoy a larger margin on its sales into the UK? There is nothing changed in terms of competitive conditions between them. That is the start point and maybe that is the part of my model that deals with the one to one. That is the start point.

Then, the second part of the model, the cost part of the model is saying, ah, well, the story is not quite as simple as that, is it? Because those exporters, one of them at least, DAF, is facing an increase in its costs, and I would expect that to put upward pressure on its euro prices and therefore reduce the amount of exchange rate pass-through.

MR RIDYARD: When you say an increase in its costs, it is an increase in its euro-denominated costs.

MR HARVEY: Correct.

MR RIDYARD: The pounds are still the pounds --

MR HARVEY: Yes --

MR RIDYARD: -- but the pounds are more expensive.

MR HARVEY: (Overspeaking - inaudible) responsibility, which is what DAF is concerned with.

So, to me, modelling it in this way is entirely intuitive and reflects the way that -- the commercial reality of the way this market worked.

So those are the two components of my model.

Going to the idea of I have not estimated something, it is just hard wired in. Well, for the same reason that is not true either, because my model is allowing the effect of changes in the exchange rate to think through to how much prices in pounds ultimately changed. So I do not think it is sort of as acute as Professor Neven has suggested.

Turning to Professor Neven's model, the motivation seems to be to look at it obviously from a UK pricing perspective, and the idea that the UK costs would change and that would feed through to UK pricing decisions, I presume linked to the idea that the UK was looking at the IKP cost measure and so forth. I do not think that reflects the way that DAF NV was actually making pricing decisions, or its influence, rather, over DAF UK's pricing, where they were looking at the margin position in euros.

So I think -- then turning to sort of restrictions and the extent of them, there is a restriction in Professor Neven's model too, which we have not spoken about yet. The restriction is that, in a world where all of DAF's costs were in euros, the maximum rate of exchange rate pass-through, implied by Professor Neven's model, is the rate of the cost coefficient, which we spoke about earlier, so it is around 80%. That is the restriction in the model.

What I am saying is, I do not think that that restriction, in view of the fact that we have DAF competing with other euro exporters who would all benefit to a similar degree to that change in exchange rate movements, is valid either.

MR RIDYARD: I will give Professor Neven a chance to say why he does not agree with that, because I can see he does not, but why are you characterising Professor Neven's model like that? Is that because 80% is the cost element and 20% is the margin element?

MR HARVEY: Actually because it is the coefficient on the cost.

MR RIDYARD: The coefficient on the cost. Sorry. Right, okay. Yes.

MR HARVEY: Approximately. Approximately. So the consequence of that is that, when the exchange rate moves and when the pound strengthens, in effect DAF enjoys an elevation in its margins that is sustained. I find it quite difficult to square that with competition in this market, where all of the rivals will have benefited from -- or not -- from the exchange rate movement to a similar degree. It is another way of saying, if there is a competitive margin prior to the exchange rate movement, why would the exchange rate movement give rise to a different competitive margin but for the cost route that I described earlier that I have captured in my model?

MR RIDYARD: So just to strip it back to the beginning of that description. We were talking about a situation where the pound appreciates against the euro, let us take out the -- just to keep things more simple, strip out any notion of UK production here. So let us say we are talking about everyone making their products in the euro zone. They all -- they were making a particular profit margin before this exchange rate change happened and they were all -- there was an equilibrium they were all happy with. So suddenly the pound appreciates against the euro, suddenly those constant pound prices look a lot more attractive to these European -- people exporting from the euro zone into the UK. Your proposition is that that would all increase their profit margins so that they would very quickly reduce their pound prices to get back to the same equilibrium that they were in before the exchange rate change happened?

MR HARVEY: Yes, that is it, and --

MR RIDYARD: Are you saying that would be instantaneous? I know nothing is instantaneous, but I mean as good as?

MR HARVEY: So I am saying that I think it would be quick. I do understand that, of course, that it is not like it would happen on the second day or something like that --

MR RIDYARD: Yes.

MR HARVEY: -- but that is not really the -- as I said earlier, that is not really the circumstances we are dealing with here. We are dealing with a sort of sustained difference --

MR RIDYARD: So you are saying there is no reason why there would be a sustainable, you know, increase in the profitability of these exporters from --

MR HARVEY: No.

MR RIDYARD: -- the euro zone to the UK just because the exchange rate change had --

MR HARVEY: That is right. Essentially, what I am saying is that what determines those margins is the strength of competition.

MR RIDYARD: Yes, I understand that.

MR HARVEY: I do not see why that would have changed.

I would reach a different view if we were looking at a different market where I am a euro supplier and I am competing with a local company. Of course, that would be different, but that is not the situation here.

MR RIDYARD: Professor Neven?

PROFESSOR NEVEN: Yes, I just want to disspell the notion that when the pound appreciates, the prices in my model do not go down. They do. I mean, there is this effect that you are all describing. I mean, what happens is that when the pound appreciates it means that of course DAF and all of its competitors in relation to UK -- the UK markets are becoming more competitive; the cost expressed in pounds goes down; and, in my model, the prices do go down, so this effect is there.

Now, so I just want to make that clear. I mean, the prices do go down. The question is really: by how much the prices go down and how you estimate that? That is really the question. What I am saying is that Mr Harvey is imposing a straitjacket on the data; okay? I am letting the data determine the amount of its pass-through, and Mr Harvey is correct in pointing that, in my estimation, at least the main estimation that I have put forward, the only channel through which the exchange rate has an effect on pound prices is the cost, and, of course, the cost -- the share of the cost that is incurred in euro. He is right to say that the effect of the exchange rate, say there was an appreciation of the pound, the cost in euro leads to lower costs expressed in pounds, I mean, because of the appreciation of the pound. This will feed into the price through this cost coefficient, what you referred to as being 0.8. That is, I mean, the main estimation I am putting forward.

However, I am also doing some sensitivity analysis, in which, in addition to that channel, and just to be clear, the exchange rate that I am using is the budget rate, but I will talk about that in a second, so in addition to that channel, I also introduce the exchange rate as a stand-alone variable to see whether there is an additional impact; okay? What my model shows is that, if I do that, I still obtain a very sensible estimate and I think an estimate that can identify the effect of the exchange rate; okay? So it is not correct to say that in my model the only mechanism -- the only way in which the exchange rate affects pound prices is through the cost incurred in euro, but expressed in pounds. When I introduced the exchange rate as a stand-alone variable, there was an additional effect.

Now --

MR RIDYARD: Sorry, can you explain that a bit more? When you introduce the exchange rate variable what happens?

PROFESSOR NEVEN: I will explain that and I think I want to explain that in relation to what I observe in DAF; okay? Because that is important to interpret that equation.

What I observed in DAF is that the OMS system is giving you the costs. I mean, it is not MLO; it is essentially the -- you know, a version that has an additional margin. It is IKP. But what they see when setting the prices is the IKP at the budget rate.

So it is essentially the cost expressed at a conventional exchange rate which is by and large last year's exchange rate.

THE CHAIRMAN: When who sees that? Mr Ashworth?

PROFESSOR NEVEN: Mr Ashworth, all of the executives at DAF who are setting prices in negotiation with dealers. We have seen that in the evidence of Mr Ashworth.

You remember that in the evidence of Mr Ashworth, you have a screenshot from OMS. In that screenshot, you see IKP, which is the cost measure, and it is a cost measure in OMS when they are negotiating the prices with the dealer, which is expressed at the budget rate.

THE CHAIRMAN: Although I am not sure that was his evidence, was it?

PROFESSOR NEVEN: Yes. It was.

THE CHAIRMAN: I thought it was(?) fixed ...

MR RIDYARD: No --

THE CHAIRMAN: Okay.

PROFESSOR NEVEN: Okay, we had that discussion about, you know, when I look at the data, there is only one thing, which is the budget rate. Okay?

So, in that, in the OMS, what you see is the IKP at the budget rate. This is the cost they see when they are negotiating the prices with the dealers.

That is what my model represents, because my model says that you will set the prices in light of your cost estimate in pounds, which is what you see in the OMS, which is your cost expressed in pounds at the budget rate. So this part -- you know, my modelling strategy really captured this, is that when they are setting prices, the cost they see and so the cost they should take into account is the cost at the budget rate.

Now, I also agree with Mr Harvey that when there are big changes in the exchange rate, okay, there will be a big discrepancy between the budget rate and the current rate. So they might be concerned. I mean, DAF NV might be concerned about what pricing on the basis of the budget rate might actually mean in terms of the margins in euros. I mean, let us think about, for instance, because maybe it is clearer, a big depreciation of the pound, something like something that happens in 2008; okay? There was a big depreciation of the pound, which means that Mr Ashworth and his team will see, in 2008, a cost in pounds which does not reflect the depreciation. I mean, it is the cost in pounds of the previous year. So, I mean, they will tend to set prices on the basis of, you know, the costs expressed at last year's exchange rate, which does not take into account the fact that the pound has depreciated, so that actually in current pounds, the cost would be higher.

So you would expect in those circumstances, like 2008, that DAF NV might be concerned about this, about the fact that they are still setting prices on the basis of cost expressed in pounds at an exchange rate that does not reflect the current exchange rate. So they would be concerned about the consequences for that in terms of euro margins. So you might expect that in some circumstances, in some deal, they will impose a further adjustment. They will actually, for instance, in the case of 2008, instead of letting Mr Ashworth and his team set prices on the basis of the cost expressed in last year's exchange rate, they will want to have higher prices, because, you know, they will want not only to take into account last year's exchange rate, but also the current change.

This is exactly what the stand-alone exchange rate variable in my model does. So I introduce the budget rate through the cost as one channel in which the exchange rate is affecting prices in pounds. In the estimates that I present in the appendix of my first report, I also introduce the current exchange rate, not the budget rate, the current exchange rate as an additional stand-alone variable, and what I see is that, yes, it is significant. It is not very -- the sign is not very strong, but it is significant and it leads to an effect that is exactly the effect that I predicted. That is to say that the adjustment to the exchange rate is actually a bit faster than the exchange rate that only would go through the budget rate. So there is an additional effect of the current exchange rate which, for instance, in 2008, will actually capture this idea that DAF NV will not be happy with Mr Ashworth and his team setting prices on the basis of cost expressed in last year's exchange rate but they should take into account the fact that the pound has depreciated so that the costs incurred in Europe, expressed in pounds at the current rate, are actually higher.

MR RIDYARD: So it is measuring a kind of catching up effect or --

PROFESSOR NEVEN: Yes, exactly.

MR RIDYARD: -- where the euro zone operation is saying wait a minute, we do not want to be (overspeaking - inaudible) --

PROFESSOR NEVEN: Exactly. That is exactly --

MR RIDYARD: -- on the basis of false signals here.

THE CHAIRMAN: Do we know that that is what DAF actually did when they approached it?

PROFESSOR NEVEN: Yes, what we see, certainly in what Mr Ashworth has been describing, is that through the operation of the mandate system, if the prices set by Mr Ashworth, you know, are becoming a bit too low, then they will be reviewed by DAF and DAF might impose some further constraints.

I think that what I am describing in terms of my econometric result, what my model does and what I am describing in terms of results is fully consistent with what we hear in terms of what Mr Ashworth and his team is seeing when setting the prices and with the impact that you would expect DAF NV to have on prices because of the oversight that they have.

THE CHAIRMAN: Can I just ask a question about your models? So if you were to ignore the fact that DAF incurred some of its costs in pounds and assumed it was like the other manufacturers and incurred their costs purely in euros, would that have changed the way you did the modelling?

PROFESSOR NEVEN: I mean, it would not have changed the way I did the modelling, but my estimates would be different, of course --

THE CHAIRMAN: Yes.

PROFESSOR NEVEN: -- because a larger share of the costs at the truck level would have been incurred in a currency different from the currency from which they were setting the prices.

THE CHAIRMAN: Yes, but you would have adopted the same controls --

PROFESSOR NEVEN: Yes, but I am so lucky that part of the cost is incurred in pounds, because this is really what allows me to undertake the identification.

THE CHAIRMAN: Right. Would you be the same, Mr Harvey?

MR HARVEY: Yes, I would.

THE CHAIRMAN: Yes.

MR HARVEY: Yes.

MR RIDYARD: If we just turn to your model, Mr Harvey, you do -- just on this issue of introducing a separate variable in the -- independent variable of the exchange rate. You do experiment with that and then you abandon that. Can you explain why that took place?

MR HARVEY: Yes, so perhaps we look at the result.

MR RIDYARD: Yes.

MR HARVEY: I think you are referring to the third report. I can give you a qualitative ... so by two sort of broad sensitivities in the analysis.

One was actually responsive to Professor Neven, where I included an exchange rate control, but all I -- I did not really learn a huge amount from that because it just recreated the problem that we spoke about earlier, which is you have the step change in the infringement -- sorry, the step change in the exchange rate, and so essentially the model is not able to sort of tease out the effect of the infringement from the effect of the exchange rate.

The sensitivity I did look at, which was the one I mentioned earlier, was to change the use of the market rate, so the current exchange rate, to do the conversions, and instead include -- do the conversion using the budget rate, so effectively to reflect this idea of a slowing-down of the rate at which these effects would take place. I find that my results are robust to that change.

So my --

MR RIDYARD: What does that mean?

MR HARVEY: It means the overcharge estimates did not change very much.

So I took from that that actually the primary issue here is not so much the question of speed, how quickly these things take place, but rather the fundamental decisions that we have made around whether we model in euros or model in pounds. That was my interpretation of the sensitivities.

MR RIDYARD: Okay.

I think this may be a good moment to take a break and we will take stock. We have not finished this topic, but let us take a quick break I think.

THE CHAIRMAN: Yes, we will have a ten-minute break.

(3.12 pm)

(A short break)

(3.27 pm)

THE CHAIRMAN: I think we have actually covered quite a lot of the ground, but I just wanted to ask a couple of questions about the general -- the reasons why, Mr Harvey, you converted into euros and, Professor Neven, you converted the other way, and whether, if you had done the reverse in your model, you would have come up with adopting the same other characteristics of your models, whether a different result would have come about.

So, Mr Harvey, if you had decided to go the other way and convert everything into pounds, how would that have affected things?

MR HARVEY: If I had converted the --

THE CHAIRMAN: The cost.

MR HARVEY: Yes, the costs into pounds, you would end up with the model of Professor Neven, other things equal.

THE CHAIRMAN: So which way you go affects materially the result?

MR HARVEY: Yes, it does.

THE CHAIRMAN: Why is that?

MR HARVEY: It is related to the underlying restrictions and assumptions that are implied by a model that is prepared in pounds versus a model that is prepared in euros. So I will try.

So, in my model, the model in euros, in effect what it says is, put to one side the pound element of costs for a moment, it says that an exchange rate change would not be expected to affect the margins that DAF earns and the reason for that is that all the exporters into the UK are faced with the same change. Their competitive position has not altered. The strength of rivalry is the same.

So that is essentially the underlying assumption when you prepare a model in pounds -- sorry, in euros.

In Professor Neven's model --

THE CHAIRMAN: Sorry. That is because they calculated their margins in euros and they would be ...

MR HARVEY: Well, the underlying intuition is that they are competing with other companies that experience exactly the same advantage or disadvantage as a consequence of the exchange rate moving, and so that the exchange rate has moved does not make -- does not give me reason to believe that their overall profitability would change.

Obviously, there are other elements of my model, but in terms of sort of trying to isolate the differences between the two, that is what is inherent in the euro model.

Then, in the pounds model, margins are allowed to change, and that is because the way that model works is that pounds prices are affected by cost changes and pounds prices move less than one for one with pounds costs in Professor Neven's model. What that means is that when there is a cost reduction, the underlying -- the underlying -- well, the outcome is that DAF enjoys a higher margin.

MR RIDYARD: The evidence between you and Professor Neven is on the exchange rate that is used for this conversion too. So if we did the pound-based analysis, but with instantaneous -- with current exchange rates, you would still get this effect that you just described, or this difference you just described?

MR HARVEY: Yes. Yes. So in the euros model, where rather than using the current exchange rate, I instead use the budget rate --

MR RIDYARD: Sorry, let us put the budget rate to one side. What I want to know now is the difference between doing it in euros, as you have done, and pounds as you could have done, but using the current exchange rate.

MR HARVEY: Sorry, I think --

SIR IAIN MCMILLAN: As a stand-alone variable you mean, I think.

MR HARVEY: Sorry, Mr Ridyard, can you repeat the question?

MR RIDYARD: Instead of doing your model in euros, you do
your model, exactly the same model, in pounds, but you
convert the costs, the euro costs into pounds using the
current exchange rate rather than the budget exchange
rate, as Professor Neven has done?

MR HARVEY: That is right.

MR RIDYARD: Right. So the answer you just gave about you
getting different results because of the relationship
between costs and prices, that would still hold true.
What you said in your original answer to the chairman's
question applies even if you use the current exchange
rates?

MR HARVEY: Yes.

MR RIDYARD: Yes.

MR HARVEY: Yes. Sorry.

THE CHAIRMAN: Right.

Do you want to say something, Professor Neven?

PROFESSOR NEVEN: Yes. The first thing I would like to say
is that I am not exchanging anything. The prices that
I have are in pounds, the costs that I have are in
pounds, so --

THE CHAIRMAN: Some of them.

PROFESSOR NEVEN: No. I mean, the costs that you see in OMS
are costs that are in pounds using the budget rate.
That is to say, in order to obtain these estimates in

pounds, what OMS does is to take the pound share, you just keep it in pounds, you take the euro share, you express it in pounds at the budget rate. So I am not sort of applying any exchange rate. I am using the invoice prices that are in pounds. I am using the costs that Mr Ashworth and his team see that are in pounds, but they are constructed from pound cost, of course, just pounds, plus the euro cost expressed in pounds at the budget rate.

MR RIDYARD: But you are accepting the use of that exchange rate --

PROFESSOR NEVEN: I am accepting -- I see this is what they use and, you know, I use that as an estimate of the costs in pounds that they would use for the sake of pricing and this is what I introduce in my model; okay? So I am not exchanging anything. I am basically using what they saw, and then, as I said, I do some sensitivity in which I see whether the prices might sort of react differently if I also -- or actually I see whether I have an additional impact on the price, an additional effect, which is associated with the current exchange rate, which corresponds to what I described earlier as the influence that DAF NV may have had in trying to lead to a faster adjustment or slower adjustment, as the case may be, but lead to a faster adjustment, this is what the data shows, relative to simply using the cost expressed at the budget rate that they saw.

Now, I still want to, if I may, comment on the issue that we face here in terms of identification, which I think is quite different for the earlier period and for the later period, because what we see in the earlier period is the sharp appreciation of the pound, and we understand that if we adopt the methodology of Mr Harvey, imposing, you know, full pass-through into the price, any deviation in actual pricing by DAF from this full pricing is going to be absorbed by the infringement, I mean. So it is going to be absorbed by the estimation of the infringement which is why I think that there was an identification problem.

Now, the fact that when Mr Harvey introduces the exchange rate in his equation, instead of having an overcharge of 12%, he gets an overcharge of 1% or 1.2, basically shows that there is an identification problem.

If there was no identification problem, introducing this exchange rate as a stand-alone variable should not affect the infringement point.

So you have to deal with it in a way or another with this issue, and I think that it is extremely difficult in the before/during period to actually deal satisfactorily with this concomitant change in the exchange rate and the beginning of the infringement. I think it is very difficult.

You know, in the later period, we are fortunate that we have a better identification strategy because we have costs that are separately estimated at the truck level in pounds and in euros, so we can use this difference across trucks in order to capture the effect of the exchange rate because, you know, this difference is going to allow me to say, okay, this is due to the exchange rate because these trucks have a big share of the cost that is incurred in euros, so I should expect a bigger effect, and that is what the model is going to pick up. But this is not an identification strategy for the exchange rate that I could use for the earlier period.

That is why I think that it is a very severe problem that you have originally and that is why I think, as I explained this morning, that doing the before/during model is very difficult because you have this concomitant change in the exchange rate at the beginning of the infringement and you need to do an identification of the infringement purely from the time series, I mean, from the fact that the prices are changing over time and that the exchange rate is changing over time, and the infringement is also changing over time. There is not much help from the cross-section of trucks.

Maybe I stop here because I think that the problem with respect to the second part and the identification of the exchange rate in the second part of the infringement, when we have this big depreciation of the pound in 2008, is a problem that needs to be discussed also in relation to the financial crisis, because there the problem is actually that the depreciation of the pound in 2008 is occurring at the same time as the beginning of the financial crisis, and there, there is an additional identification problem.

THE CHAIRMAN: I understand the difficulties if you have got a big appreciation in the pound at the beginning of the infringement period, but I do not know whether it continued to strengthen or whether it sort of stayed at that sort of level for the next few years.

PROFESSOR NEVEN: That is the problem, is that the pound appreciates and then does not vary much --

THE CHAIRMAN: Yes.

PROFESSOR NEVEN: -- until the end of the AS/400.

THE CHAIRMAN: Yes.

PROFESSOR NEVEN: That is why putting the AS/400 together with the MI data is also useful to identify the effect of the exchange rate, because you do not only have this big appreciation of the pound at the beginning, you also have, you know, a period of stability, then you have the big increase, the pound is falling, the pound is depreciating with the financial crisis, it stays below, then it goes up a bit. Then with Brexit, boom, goes down, and then recovery from Brexit news, and it goes up again.

All of these variations are actually useful in order to identify the effect of the exchange rate.

THE CHAIRMAN: I can see how it would distort your ability to identify the infringement effects at the beginning when there is a sharp appreciation, but once things sort of stabilise, are you not able better to see whether the exchange rate is having an effect or not?

PROFESSOR NEVEN: Yes, I think that I can, in the context of my model in pounds. Yes, I can, because I use this cross-section which, I mean, is essential in order to identify the effect of the exchange rate. But the challenge that I have, using this variation, is indeed to disentangle the main shock of the exchange rate through the later period is the 2008 depreciation of the pound. That is again 10%. You know that is happening within a few months.

In order to really measure the impact of that, you need to disentangle it from the effect of demand which is happening at the same time. I think that my model in pounds, with the approach that I use for the financial crisis, actually can capture this effect, yes.

THE CHAIRMAN: Mr Harvey, do you accept that the sharp appreciation at the beginning of the infringement period causes a problem for identifying what are the exchange rate effects and what are the infringement effects?

MR HARVEY: Yes, I do. The issue that we are both presented with is: in view of that challenge, how do we best model pricing to try and winkle out the overcharge? So I do not think there is any disagreement between us in terms of the existence of the problem because that is just what happened. It is more how best to deal with it.

The question you raised around, you know, when you enter into a more stable period, does that help? The answer is, counter intuitively, not a great deal, which is because really what we are interested to understand is, when you do move from a period where the exchange rate is rather low to a period where the exchange rate is rather high, what effect did that have on pricing? So in a sense there may -- when you are into a more stable period, you have almost like less information in a sense to understand the relationship --

THE CHAIRMAN: Which is like the variability.

MR HARVEY: It is the variability issue.

THE CHAIRMAN: Yes.

MR HARVEY: So, in a way, it is really unfortunate the infringement started and ended when it did, because if it did not, we would have the variability we needed.

THE CHAIRMAN: Yes. All right.

MR RIDYARD: Okay. I would just like to turn to ask some questions about the various sensitivities and checks that you have both done to try to get underneath this exchange rate problem, to see how we should interpret those results, because I think it is fair to say that you disagree with one another on how one interprets those different results, and what they are, what they are telling us.

So perhaps, Professor Neven, you would go first. You have already touched on some of this already, but if you could give us a sort of summary of what further sensitivity checks that you have done to see whether they can shed light on why your chosen approach to the exchange rate effect is the appropriate one and what lessons they tell us about your approach and Mr Harvey's.

PROFESSOR NEVEN: Yes. I have touched on this before. I think that my default specification is one in which I used the cost that is in OMS. I mean, this is the cost in pounds using the budget rate, and I see with that strategy how I can identify the effect of the exchange rate.

Then, instead of solely using the budget rate, which is essentially used in order to produce that cost data, I also add as a stand-alone variable the current exchange rate. This is to try to replicate this thought experiment that you had sort of DAF NV up there, which was also insisting on carrying out to the margins in euro. If I do that, I obtain an estimate which is remarkably robust, in the sense that I have a sensible coefficient estimate for the stand-alone current exchange rate; my estimate of the cost pass-through remain sensible; my estimate of the demand variable remain sensible; and this is true both in the MI period and in the earlier period -- in the model that uses, I mean, the before, during and after.

Now, I also report alternative ways of trying to identify the exchange rate in the infringement which, instead of using the budget rate for the cost in combination with the current rate as a stand-alone variable, I used alternative combinations; okay? What I see is that whenever I use the current rate in order to express the cost, I mean, there, my identification strategy does not operate anymore. So --

MR RIDYARD: Can you explain that a bit, please?

PROFESSOR NEVEN: So I explain that, yes, because when, instead of expressing the costs in pounds, but instead of using the budget rate, which is what they see, using the current rate. So I construct a cost measure in pounds, which has the cost element in pounds, which I keep in pounds, plus the euro element, but instead of using the budget rate, I use the current rate, to see, you know, maybe they react actually to the immediate changes in the exchange rate as replicated, as sort of expressed in the cost.

When I do that, I see that there is an identification problem. What I see is that, in particular, I can no longer well identify the effect of the exchange rate from the effect of demand. That is particularly the case in the second period, in the MI period, which is an issue that we will return to when we discuss the modelling of the financial crisis.

But what this tells me is that my model in which I have the costs expressed as the budget rate really reflects how they are setting the prices for trucks. When I try to -- an alternative identification, in which I tell them, look, the cost that is relevant for your pricing is not the cost at the budget rate, but the cost at the current rate, then my model is no longer able to disentangle the effect of the exchange rate from the effect of the demand.

So I think that, indeed, this idea that you are using the cost at the budget rate, which corresponds to the way in which DAF was setting the prices and the way in which Mr Ashworth and his team were setting the prices, is an important component of the identification strategy.

MR RIDYARD: But you say this reflects the way that DAF UK set its prices, you know, looking at the signals from the IKP, but you also said that when you put in the exchange rate as a separate variable, it picked up something -- it picked up this kind of possible head office oversight or correction.

PROFESSOR NEVEN: Yes.

MR RIDYARD: So does that not in itself imply that, by some means or another, DAF's UK pricing was not following the signals from the budget rate and it was --

PROFESSOR NEVEN: That is correct. I mean, they are not only following the signal from the budget rate, but I think that what this sensitivity analysis shows is that the primary signal is the signal from the budget rate and there is some adjustment with respect to that, and this is the best way to model the way in which prices are set. I think this is what this is saying.

MR RIDYARD: Mr Harvey, can you comment on that before we talk about the things that you have done?

MR HARVEY: I think, in terms of the inclusion of other control -- the exchange rate control variable in those models, really what you need to do to have a sort of fully flexible model that accounts for exchange rate movements is to include a control for the current and potentially lagged budget rates.

But the other thing that you need to do is to sort of set free the adjustments that you made to the costs as well, and that is not what these restrict -- sorry, these sensitivities do.

So still within the sensitivities, there is still this restriction that the primary cost -- the cost route is driving the pricing decision. What we are not fully reflecting is, if you like, the leaning of DAF NV on DAF UK in terms of the pricing decisions it made. So really what you need to do is to have a model that sort of removes all of that inflexibility, and that is not what these restrictions -- sorry, that is not what these -- sorry, add to that flexibility, and that is not what these restrictions -- sorry, what these changes do.

PROFESSOR NEVEN: I think I disagree with that. I think that in the table in -- I think it is table 9 or table 10 in the table in the appendix, I have both the budget rate for the cost and I have the stand-alone exchange rate, current exchange rate, which reflects, you know, DAF NV's input, and DAF NV's, which says, no, you should go faster than what is dictated by the cost expressed in the budget rate.

So there is flexibility, I mean, and, of course, by adding the stand-alone exchange rate in that sensitivity, I allow for the flexibility.

MR HARVEY: But if you are not right that the way to look at the costs is via the budget rate, then that result is already hard-wired in. You have not introduced the flexibility.

PROFESSOR NEVEN: But I introduced the flexibility by having a stand-alone variable, I mean, and this is what introduces the flexibility.

What I also see is that, if, instead of using the budget rate for the cost, I use the current rate, then I mean, I have an identification problem and the identification is with respect to demand.

That -- you know -- so there is flexibility in that formulation, and I also understand, you know, why there is the alternative assumption I have an identification problem.

It is because of what is happening in 2008. In 2008, the current -- whenever I introduce the current exchange rate which, boom, happens at the same time as the financial crisis, there is a problem. So it is not as if I have a model which is not robust and I do not understand why. I mean, I have a model which works, which corresponds to the way in which DAF is setting prices. When I tried an alternative, I also understand why my identification strategy no longer works.

MR HARVEY: But another way of saying my identification strategy does not work is to say the results that I get when I allow for the flexibility that we are talking about here, the model does not work.

PROFESSOR NEVEN: No, I disagree with this because flexibility, I introduce it by allowing for the current exchange rate as a stand-alone variable. That is the flexibility and this flexibility works.

MR HARVEY: But in addition, what you would need to do to create the full flexibility is to include in that model not just the exchange rate for the current exchange rate, you would also need the budget rate to be included.

PROFESSOR NEVEN: No, I do not want to include the budget rate together with the current exchange rate stand-alone variable in particular when I have already introduced the budget rate as the variable that is used in order to express the cost. I mean, that would be introducing immediately a problematical irregularity, so that would not be a sensible test.

MR HARVEY: No, but that is what you would need in order to fully understand the effect of exchange rate pass-through on your model.

PROFESSOR NEVEN: No, I disagree with that. I think that I understand the effect of the exchange rate pass-through in my model. It is robust to the introduction of a stand-alone variable for the exchange rate, and I also understand why alternative specifications or alternative attempt to try to identify the effect of the exchange rate and the infringement do not work.

Sorry to say, but I am not imposing anything, I am just estimating everything, and an estimation in euro, as we have established, is one in which the prices in pounds have a one to one relationship with the exchange rate, and that is imposed. That is imposed in the estimation. I am not imposing anything. I have an identification strategy and I test the limits of that identification strategy.

MR RIDYARD: Okay. Is there anything else that you did on the sensitivities -- on the exchange rates that you would like to raise or discuss at this point?

PROFESSOR NEVEN: I have done -- okay, let me think ... whether there was anything that I want to explain.

Yes, I mean, of course, we have to observe that in Mr Harvey's specification for the before/during, if you introduce the exchange rate as a stand-alone variable, then the infringement goes to 1%, so there is really an identification problem. So I am not commenting in particular on the estimate of the infringement, but there is clearly a problem.

Similarly, if you are using his during/after model and if you introduce a stand-alone exchange rate in his during/after model, then you get an estimate of the infringement, which is minus 5.5. Again, I am not commenting on the number, but clearly there was a problem in terms of identification if you introduce the sort of flexibility that he recommends, okay, the sort of -- if you introduce the exchange rate as a stand-alone variable. As I explained before and as we are going to discuss further when we discuss the financial crisis, I think this is induced by the effect that he has these dummies for the financial crisis. So he is basically killing any estimate of the effect of the exchange rate in 2008 when it is taking place.

MR RIDYARD: We will come on to that in due course.

Mr Harvey, do you want to tell us about the checks and sensitivities that you have done to test out your approach to exchange rates?

MR HARVEY: Yes. As an opening -- sort of opening remark, I think because I view the problem as it is almost -- the challenge as sort of fundamental and to do with data, and as we have already established that introducing an exchange rate as an independent control, which we spoke about earlier, would be challenging, there are, I think, some sort of limits to what sort of sensitivity analyses you can do without recreating the very problem that we have tried to navigate our way around using our different modelling strategies.

But I did look at various sensitivity analyses, some of which I have already touched on. The first was in relation to the during/after model. So in that sensitivity, what I did was to replace the conversion of the prices using the current exchange rate, replace that with the budget rate to reflect this idea of delay. That change did not affect the overcharge estimates that I calculated.

The other sensitivities that I did was partly motivated by the point we were discussing earlier about the particularly strong swing in exchange rates in the before/during period. So there what I did was to knock back the rate of exchange rate pass-through to a level that is more consistent with the level that was implied by the during/after model, so I reduced it to see what effect it would have. Unsurprisingly, it does reduce the overcharge estimates, but it does not eliminate them. So they were the two main sensitivities that I did in my analysis.

There was a third one, where I introduced the budget rate as a control in my model, so added in separately, and again, that did not seem to affect the overcharge estimates greatly. But I think that is linked to what I was talking about earlier, which is really, to have a fully flexible model, you would need to include the exchange rate control as an independent variable. Ideally, that would be the same exchange rate control that you use to convert costs and prices, but we cannot do that because of the identification problem. But my models were robust to the inclusion of those -- the budget rate in it.

PROFESSOR NEVEN: Can I comment on this --

MR RIDYARD: Yes, you can.

PROFESSOR NEVEN: Because I think that they are not actually real sensitivities.

The first one in which Mr Harvey is using the budget rate in order to express the prices, this specification does not address the main problem, which is the fact that he is imposing a coefficient. So instead of imposing a coefficient of minus 1 with respect to the current exchange rate, he is imposing a coefficient of minus 1 with respect to the budget rate. But still, the problem is there that he is imposing something.

With respect to the second sensitivity, what he is sort of referring to as knocking back the exchange rate effect in his model, instead of having minus 1, he says, "Okay, I am going to try minus 88"; okay? He says, "Okay, if I do minus 0.88, I am having a result which is not too different". Now, if, instead of imposing anything, he had let the model decide, he would have obtained an estimate of 0.33; okay?

MR HARVEY: I am sorry to interrupt, but we cannot let the model decide in this period because of the identification problem. If we could let the model decide, then we would not be having this discussion. So what I have done is to use the information that you glean from the during/after period to adjust the before/during period. There is nothing -- it is not sensible to think about making -- letting the model decide, because if we could both do that, then neither of us would have needed to adopt the strategy that we did.

PROFESSOR NEVEN: I am not trying to identify something which cannot be identified. I think that what all of this is showing is that you are trying to identify something in the before/during which is really extremely difficult to identify.

Of course, if you let this coefficient be free in this estimation that you are referring to, yes, you end up with an estimate of, you know, 0.33, and, you know, this is indeed something which reflects again the fact that there is an identification problem.

Now, there is one thing you could have done though. I mean, if you are really concerned about this issue of identifying the exchange rate from the infringement, is to estimate the effect of the exchange rate on data which is not affected by the infringement. I mean, just take data during the infringement period, estimate a model in which you can estimate the effect of the exchange rate. You get an estimate, then you impose it on the -- that is something you could do. You could have done an estimate of the effect of the exchange rate on prices, which is not polluted by this problem of identification, and then impose it; and I did it in your model, and if you do that in your model, you end up, again, with an estimate of the infringement that is very similar to the one I had --

THE CHAIRMAN: What data are you referring to? What sort of data?

PROFESSOR NEVEN: Using the same data, but so -- because what Mr Harvey is describing in this sensitivity is basically a model in which you have prices in pounds, in which you have costs in euro, and then he is imposing coefficients with respect to a stand-alone variable in -- which is the exchange rate; okay? He is imposing -- instead of having minus 1, he has minus 0.88.

He says, you know, this 0.88 is informed by what I observed later, but I think that it is still imposing something, so -- and imposing something which is arbitrary.

I think that what he could have done, if he was really trying to disentangle the effect of the exchange rate from the effect of the infringement, is estimate the effect of the exchange rate on data that is unpolluted, on data that is unpolluted by the exchange -- by the infringement, then take an estimate in his euro model, use that estimate, and possibly then impose it on his model, estimated on the period that includes the infringement.

THE CHAIRMAN: Sorry, what is the data that is unpolluted by the infringement?

PROFESSOR NEVEN: Data that is unpolluted by the infringement is data which does not have a variation in price level in use by either the beginning or the termination of the infringement. So what he could have done, for instance, is use data from, say, 1998 to 2,000 -- if you use it, both AS/400 and the MI, from 1998, say, to 2007, because you do not get into the financial crisis, that creates a problem. Then you estimate the effect of the exchange rate on that data. Then you could impose it on the full sample that includes the beginning of the infringement.

Again, I would not do it personally, because I think that my alternative modelling strategy is vastly preferable. But I think if Mr Harvey really wants to have an estimate of the effect of the exchange rate, which is not affected by this problem of concurrent change in the exchange rate and the infringement, it is something he could have done.

MR HARVEY: Can I comment on that?

MR RIDYARD: Yes.

MR HARVEY: So, firstly, we discussed earlier that the degree of the variation in the exchange rates during the period is more limited, and so I think the -- I think we agreed on that, the ability to actually use that information to carry out the exercise that Professor Neven has just said would be quite challenging I think.

The second observation is, I do think it is relevant to consider that there is -- I think there is potentially a difference in the way that pricing decisions are taken when you get very large swings in exchange rates versus small changes. So I think we have touched on earlier, it would appear that there was perhaps a heavier hand from DAF NV, for example, when the exchange rate was moving in the later period. So I think there is some evidence to suggest that sort of large changes might attract a different type of pricing decision to smaller ones. So I am always open-minded to new ideas, but I think in this case I am not sure that would have been an alternative, and I think the conversation -- sorry, the suggestion was motivated by the idea of avoiding a restriction that I made based on what I learned from the during/after model. It seems -- it does not really seem to avoid that really, because I think you would criticise me potentially for making some other restriction with the data.

PROFESSOR NEVEN: I mean, you would still make a restriction, but it would be --

MR RIDYARD: You have made that point. Yes, I understand that point. Yes. That is fine. That is a helpful exchange, thank you.

I just wanted to broaden the discussion out, because this issue of how prices respond to exchange rate changes is not unique to trucks or to this particular case. So is there anything more broadly in the economics literature, the empirical literature, about how we expect prices to adjust to exchange rate changes that could and should have been used in each of your analyses?

Maybe, Mr Harvey, could you go first on that?

MR HARVEY: Yes. I confess that I did not find the literature terribly instructive so ... What it does helpfully, I think, set out from a sort of theoretical perspective are the sort of reasons why or the circumstances under which exchange rate pass-through might be incomplete, the types of factors that influence the rate of exchange rate pass-through.

So -- and, unsurprisingly, it cites some of the factors that we were speaking about earlier, relating to location of the rivals, the extent to which costs are incurred locally and so forth. I think it is sort of helpful in that respect.

Quite a lot of the studies, macro economic studies, they look at exchange rate pass-through sort of at a more aggregate level. I am not sure that really helps us here because we are concerned with a particular industry.

There are industry-level studies and what they show is that there is quite a wide range of exchange rate pass-through so, you know, down to very low figures and up to full and complete. Most of us have tried to explain that with respect to some of those factors that I spoke about earlier.

So although it sort of gives some sort of indication of the things that matter, it was not at all plain to me how I could really sort of incorporate that into the empirical analysis.

PROFESSOR NEVEN: Yes, I agree with Mr Harvey that this literature is useful in terms of highlighting the economic principles. I mean, this literature is explaining that, indeed when you are pricing in a foreign market, you incur costs in your own currency and you want to think strategically. Are you going to pass on the change in the exchange rate immediately? Are you going to do it over time? Are you going to do it fully? This literature not only highlights the underlying economic principles, I think that in particular those that are -- these studies that are performed on particular industries, they also show that, you know, the factors that we have been discussing, they do matter. I mean, the share of the cost that is incurred in a foreign currency, the competitive setting in foreign markets, all of these things, when they can be controlled for, they matter.

I think that in terms of the empirical results, I think that there is no disagreement that most of these studies find that there is less than complete immediate pass-through and that indeed -- and that makes a lot of sense in terms of if you think about what managers are doing. I mean, managers have -- all of a sudden there is an increase in cost. You wonder, "Do I pass it on immediately or do I wait?"

You also see that in the witness statement of Mr Ashworth, in which he basically says, "Maybe we wait for a year, maybe we do not actually pass on the change in the exchange rate immediately because it can revert". So these are the sort of considerations that you find in the witness statement that you also find in these studies.

Now, in terms of the empirical approach, however, what I want to highlight is that all of these studies, without exception, always introduce the stand-alone exchange rate as a control variable when they do not have cost. So what Mr Harvey is doing here, which is converting everything into euros and then not using the exchange rate as a stand-alone variable, is something that is -- not something that you encounter in the literature.

THE CHAIRMAN: So they all introduce a stand-alone exchange rate?

PROFESSOR NEVEN: If they do not have cost.

THE CHAIRMAN: When they do not have cost where?

PROFESSOR NEVEN: When they do not have cost. Some of these studies also have costs, like what we have here. So then they will look at the effect of the exchange rate through cost, some of them. But when they do not have cost, they always introduce the exchange rate as an exponential variable.

MR RIDYARD: They do this analysis in the currency of the importing country?

PROFESSOR NEVEN: That is right.

MR RIDYARD: Do you agree with that, Mr Harvey?

PROFESSOR NEVEN: Actually, just to correct this, some of these studies, they do it in the currency of the exporting country, it happens. You have some studies which do that. But they do it in an environment typically in which they do not know exactly what is the cost share that is incurred in the local country, typically the environment in which the entire cost base is incurred in the exporting country and then there is less of an issue but there is always an exchange rate variable.

MR HARVEY: I am sorry, I am reluctant to make sort of sweeping statements about exactly, on balance, what the empirical literature exchange rate pass-through says. You do see models that include separate control variables but I have already said that, in the ideal, that is what we would want to do here, to flexibly control for exchange rates, but we have quite a particular problem which is that we are interested in the effect of the infringement which coincided with those changes. So I am not sure a huge amount can be inferred from that.

It is true that, as I said earlier, the empirical literature does show a range of rates of exchange rate pass-through. Some of them say it is very high, some of them say it is lower. Just to re-emphasise, my model is not saying that there is 100% exchange rate pass-through. I do not know whether Professor Neven intended to sort of hint that, but just to clarify.

MR RIDYARD: Okay.

THE CHAIRMAN: Right. So that is the end of that topic which is probably a convenient moment to break for the day.

Is there any cross-examination, any clarification?

MR BEARD: I only have one actually. If I may, go back to page [122] on the transcript, it was just a filling-in-the-blanks follow-up, if I may. So it is a question from Mr Ridyard at line [16]:

"Your proposition [I think this was initially directed to you, Mr Harvey] is that that would all increase their profit margins so that they would very quickly reduce their pound prices to get back to the same equilibrium that they were in before the exchange rate change happened?

Then Mr Ridyard asked:

"Are you saying that would be instantaneous? I know nothing is instantaneous, but I mean as good as?

"Mr Harvey: I am saying that I think it would be quick. I do understand that, of course, that it is not like it would happen on the second day ..."

But you are saying it would be quick. Did you actually carry out any empirical analysis of whether prices did change in the face of exchange rate shifts?

MR HARVEY: It is a difficult thing to do because of the discussion that we have just had. So the answer is no, but in a sense what you need to be looking at is prices can be affected by all sorts of things. So the purpose of doing the regression model in the first place is to try and account for those other things. So a sort of simple, if you like, pair-wise comparison between one price at one point in time and another does not really tell you about the exchange rate movement.

MR RIDYARD: You need the same truck sold to the same customer in the same circumstances before and after the exchange rate, which would not really be available to us.

MR HARVEY: Correct.

PROFESSOR NEVEN: Well, we had one such example.

MR BEARD: I think we do have that example.

PROFESSOR NEVEN: That is right. We have one such example.

MR RIDYARD: Okay. Well done.

PROFESSOR NEVEN: We have an example of exactly the same truck with exactly the same MLO.

MR HARVEY: I do not doubt that we can find those examples in the data.

MR BEARD: This is Professor Neven's supplementary report, it is E/IC66/30 I think.

PROFESSOR NEVEN: That is right. You see there is a change in the exchange rate. I think you will remember it is 5% between the two dates and these trucks are sold -- they have the same MLO, they have sold at the same price in pounds.

MR BEARD: I am so sorry, it is {E/62/30}. My fault.

PROFESSOR NEVEN: But it is not the same customer, but they are both small customers.

THE CHAIRMAN: So you are saying there was no exchange rate pass-through at all, it was at the same price --

MR HARVEY: Can we see it? It is not on the screen.

MR BEARD: Yes, absolutely. I am really sorry, I gave the wrong reference, Mr Harvey. It is my fault. It is {E/62/30}. Does that make sense? There we go. Thank you very much.

PROFESSOR NEVEN: So same truck, same MLO, same price in pounds, change in the exchange rate in between, no adjustment.

MR HARVEY: Different customer.

PROFESSOR NEVEN: Different customers but similar size.

MR HARVEY: The difficulty with this type of analysis is that we have got a large enough data set to find exceptions or examples and I am sure that I could find some alternative. This does not work anyway because it is a different customer.

MR BEARD: I see. I just wanted to check whether you had looked at that at all, but the answer is no. Thank you.

MR HARVEY: I gave you a reason why I did not, Mr Beard.

MR BEARD: Yes. Thank you, Mr Harvey.

THE CHAIRMAN: Anything else?

MR BEARD: No.

THE CHAIRMAN: Mr Ward, do you have any questions for clarification?

MR WARD: No, I do not.

THE CHAIRMAN: All right. Pleased to see you are still there!

Very good. So we will resume tomorrow. I do not know whether we will take all day tomorrow on the remaining topics but probably quite a large part of tomorrow, and I think in any event we will not start cross-examination until Friday to give people a bit of a break and also maybe you want -- because they will be coming out of --

MR BEARD: Yes, I think that would be preferable all round and given the reasons why we have shifted things, that is probably sensible on all counts.

THE CHAIRMAN: All right.

Overnight I am afraid you remain in the hot tub, you cannot get out.

We will see you tomorrow at 10.30.

(4.19 pm)

(The hearing adjourned until
Thursday, 26 May 2022 at 10.30 am)

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