COST OF CAPITAL WORKSHOP
12 NOVEMBER 2009

[8.54 am]

CHAIR: Let's make a start. It's actually a few minutes earlier but everybody seems very keen to make a start on today's workshop. I'd like to welcome you to the Commerce Commission's cost of capital workshop. As we have signalled in the preparatory material for this workshop and at the Conference on Input Methodologies which we held back in September this year, the Commission is developing input methodologies applying to the supply of electricity lines services, gas pipeline services and specified airport services under Part 4 of the Commerce Act, and this workshop is an important part of that continuing work stream which is the jurisdictional basis for this workshop today.

My name is Mark Berry, I'm Chair of the Commerce Commission. With me at the workshop today are the following parties who are going to be also members attributed to the Part 4 input methodology determinations. They are Peter Taylor to my immediate left, Sue Begg to my right and to my far right Pat Duignan.

Associate Commissioner David Caygill will not be participating during this workshop but will have access to the transcript to inform his deliberations on the cost of capital input methodologies so far as he is involved in electricity lines services matters.

We are also joined today by Commissioner Anita Mazzoleni to my far left. She is a member of the Commerce Commission on all of its telecommunications divisions. She is participating in this workshop today in relation to issues which are common to the sectors covered under Part 4 and also the telecommunications sector.

Finally in attendance from the Commission are Commission staff who are seated at the table to my immediate right over here. I should add that the sessions today will be

variously chaired by Commissioners Begg, Duignan and Mazzoleni as the day progresses.

Also in attendance is Dr Martin Lally in the capacity here as independent expert to hear the views of interested parties. He will be providing advice to the Commission during the development of the cost of capital input methodology determinations. Also attending to assist the Commission is Mr Russell Ingham. Mr Ingham has assisted the Commission in constructing its working cost of capital example, the straw person example that will become a basis for discussion over the next two days.

As well as interested persons from the sectors regulated under Part 4 of the Commerce Act, the Commission has also invited independent advisors and industry representatives from both the dairy and telecommunications sectors to participate in this workshop. This has been done so that those persons can make submissions on any matters relating to the cost of capital guidelines which the Commission is working to finalise in parallel with its work on input methodologies. As you'll know we've set down two days for this workshop as explained in our final agenda which was issued on the 6th of November.

Just some background to this workshop; the Commerce Amendment Act has, as you'll know, introduced significant changes to the parts of the Commerce Act relating to the economic regulation of goods and services in New Zealand. These amendments directly affect the Commission's role in regulating electricity lines services and gas pipeline services. The Commission's responsibilities also now extend to specifying information disclosure requirements for airport services supplied at the Wellington, Auckland and Christchurch International Airports.

The Commission is required under Part 4 to set up-front input methodologies applying to the services regulated under Part 4 of the Act and the Commission has been working towards determining input methodologies for gas, electricity and specified airports in accordance with the timetable provided under Part 4. The Commission released the Input Methodologies Discussion Paper on the 19th of June this year and that set out the key issues for each proposed input methodology and the Commission's initial proposals for consultation.

Also released on 19th of June were the Commission's revised draft guidelines for estimating firms' cost of capital. Once finalised the cost of capital guidelines will describe the Commission's high level framework to estimating regulated firms cost of capital which can then be applied across a range of sectors, including gas and electricity.

The approach outlined in the revised draft guidelines provides the basis for sector specific methodologies, including the cost of capital methodologies for suppliers of goods or services regulated under Part 4. The sector specific methodologies will be consistent with the high level framework as will be set out in the guidelines. Given this interrelationship with the cost of capital input methodologies the Commission has progressed the guidelines and the input methodology work streams in parallel and the Commission will continue to do so.

As part of the process for producing the cost of capital guidelines, the Commission has previously engaged an expert panel consisting of Professors Myers and Franks and Dr Martin Lally to review its draft guidelines. Those guidelines are entitled 'The Commission's Approach to Estimating the Cost of Capital'.

The same expert panel has also been asked to review submissions on the Commission's draft guidelines. Professors Myers and Franks and Dr Martin Lally have produced a publicly available report for the Commission and that is entitled 'Recommendation to the New Zealand Commerce Commission on an Appropriate Cost of Capital Methodology', and you'll all be conversant with that document.

As stated in paragraph 8.8 of the Commission's Input Methodologies Discussion Paper the Commission has taken into account the experts' recommendations in reaching what are preliminary views in the revised draft guidelines. As also stated in the Discussion Paper while there was much agreement between these panel members, there were also some matters on which consensus could not be reached.

The Commission has carefully considered all views of the expert panel in light of the New Zealand context and the Commission looks forward to hearing submissions on these and related matters in the course of this Conference. I emphasise we have only reached preliminary views for the purpose of these two days as to seek to better inform us on the matters that we have addressed as I've outlined above.

Given that Professor Myers and Franks' views are in the public domain, and that the Commission has fully considered these, it does not consider it necessary for these experts to attend the workshop. However, if the Commission feels the need to clarify any issues that arise during the workshops it may seek the views of its experts, including Professors Myers and Franks, as appropriate.

Transcripts of the workshops will be available so all parties are able to revisit the discussions that take place following the completion of this Conference.

Dr Lally is in attendance at this workshop in his capacity as an independent advisor to the Commission. To the extent that Dr Lally may comment on matters relevant to the expert panel's report, the Commission again reiterates that it has had and will continue to have regard to the views of all of the members of that panel in finalising its guidelines. Equally, regard will be had to the views of all other submitters and their experts who are in attendance today.

It may be helpful for me to mention in passing here that no particular status attaches to the views of the expert panel. It will be the Commission members who will be ultimately deciding this matter and they will take into account the views of all submitters. The Commission members are approaching this matter, I emphasise at this point, with an open and independent mind.

The Commission has invited written submissions and received a significant number of such submissions accompanied by expert reports on both the revised draft guidelines and input methodologies. The Commission invited cross-submissions by the 28th of August and all of the submissions are available on the Commission's website. On the 14th of October the Commission confirmed the dates for this workshop.

The Commission had already signalled in the Discussion Paper released in June and at the Conference on Input Methodologies that the proposed timing for this workshop was later in 2009 which is of course the venue for today and tomorrow. A memorandum outlining the process, key topics, proposed representatives and draft agenda for the workshop was issued on the 14th of October with comments due by the 21st of October. After considering comments received the Commission published the final agenda on its website on the 6th of November.

Before we progress to the substance of the workshop today, I just have a few more points on procedural issues. The Commission has carefully read all submissions and cross-submissions on the Input Methodologies Discussion Paper around the revised draft guidelines. This workshop is intended to focus on areas where the Commission wants to test and deepen its understanding of written submissions made by all of the submitters. For those who were in attendance at the earlier workshop on input methodologies in September, the process and procedure of this workshop will be the same.

The workshop has been organised around a series of topics or themes and includes a straw person example to facilitate discussion. The Commissioners will move through these topics throughout the day and ask questions on them. Commission staff may also

follow-up on some of these issues and we'll pass to them for questions. In addition the Commission may also ask Dr Lally or Mr Ingham for their comments. And in this way it will be the same, the process we used at the earlier Conference with Professors Yarrow and Cave, the Commission's expert will be engaged in the same manner in this workshop.

While the workshop is focused on particular areas which we wish to explore further, the fact that we may not refer to other issues in our questioning does not mean we have reached a final view on any matter. The workshop is simply focused on issues where the Commission believes that it will be assisted by further explanation and discussion.

While this workshop provides an opportunity for views to be discussed, we would like to reiterate that the various rounds of written submissions remain the principal avenue by which the Commission seeks and receives interested parties' views. Please continue to recognise the significance of written submissions and the need for these to be comprehensive throughout this consultation process.

Following the workshop, parties have the opportunity to make further submissions and these further written cross-submissions are due by 5 o'clock on Friday the 27th of November. So again as we did with the earlier September workshop, there is this opportunity for written cross-submissions after this Conference. Everyone is invited to make a submission on any matter relevant to the cost of capital. There will also be an opportunity to make detailed written submissions on the draft input methodology determined which will be published in the course of next year as well.

The Commission intends that there should be as little formality and technicality as is necessary. The workshop is not adversarial and no party will have the right to ask questions of any other party during the proceedings unless it is requested to do so by the Commission. Our understanding is that all independent experts have signed the letter confirming that they have read the Code of Conduct for Expert Witnesses in the High Court Rules and that they agree to abide by these with all necessary modifications when presenting at this workshop.

The Commission invited a number of expert advisors and party representatives to participate in this workshop, however due to the significant number of interested parties and the limited time available at this workshop the Commission has had to restrict each party to a representative of the organisation and one expert advisor.

In the Commission's memorandum of 14th of October it requested interested

parties to advise the Commission if they required a greater number of representatives to be present in order to adequately present their views on any particular issues. Where parties have advised the Commission that this is the case the Commission has in fact allowed additional representatives to participate in that situation.

Commissioners and Commission staff will ask questions as I've already outlined. We may on some matters direct the question to specific individuals who are appearing in the round table in front of us. In asking questions the Commission will seek to canvass a full range of views on all issues. We appreciate at times that attendees may not be able to answer all questions posed and there's no problems deferring that and following up answers in the written cross-submission at the conclusion of this workshop.

The Commission expects to also publish a list of questions which rise during this workshop and they will be on the website together with the transcript by Wednesday the 18th of November. Again all interested parties are invited for further comment in answer to those questions, any questions that they felt that they couldn't fully answer at this Conference, all those are matters for cross-submissions which are due 27th of November.

As usual the workshop proceedings will be recorded. Microphones are available at the tables for speakers, we also have a microphone on a stand located behind the participants' table. Please speak into the microphone when making your presentation and identify yourself. Speak clearly and slowly so the stenographer does not have problems with the transcript.

The agenda provides a lunch break and breaks for morning and afternoon tea. The agenda is flexible and we may need to make changes as we progress. Commissioners will not be available during the breaks. Tea and coffee will be available during the morning and afternoon tea breaks. The workshop room will be open during breaks. It will not be secure during the day so please remain with your material and be careful with any confidential information you may have with you.

I am required to make an announcement as to how to evacuate the building in the case of an emergency, and given the rabbit warrens around here it is elaborate and I do not intend to actually read it out but I suggest if you follow the exit signs you won't go wrong.

The Commission's contact person for this workshop is Karen Murray. Do not hesitate to speak or contact her for any help you need on administrative issues. If you have any other questions on procedure or the agenda Karen is the person to contact in the

first instance.

Finally I understand that the parties present today have all been asked whether there is a need to discuss any confidential material in a closed session, and the advice we have received is that there is no such confidential information, so accordingly we are not proposing to have any closed sessions. If there is any contrary view that needs to be known at this point in the proceeding.

Okay, it's now time to turn to the substance of the workshop. As you'll know from the agenda we've set out a list of some eight topics that we will progress through in the course of the next two days. The first item on the agenda is the cost of capital framework and Commissioner Duignan is going to lead and chair that first session of this workshop. But if I could just begin by getting all of the parties in attendance around the table to identify themselves for the purpose of the record and then once that's done I'll pass over to Commissioner Duignan to progress the questions.

MR BASHER: Mike Basher for New Zealand Airports Association and Wellington Airport.

MR ROBERTSON: Simon Robertson for Auckland Airport.

MR BEST: Peter Best from Saha International representing Auckland Energy Consumer Trust.

MR HOOGLAND: Peter Hoogland from Castalia representing Transpower.

MR FLETCHER: Richard Fletcher from Transpower.

MR CARVELL: Alan Carvell from Vector.

PROF BOWMAN: Jerry Bowman representing Vector and Unison.

MR SHELLEY: Andrew Shelley from CRA International representing Unison.

MR MORGAN: Greg Morgan for Unison Networks.

MR IRELAND: Garth Ireland, Ireland Wallace, representing MEUG.

MR COCHRANE: Neil Cochrane representing Christchurch Airport.

MR BALCHIN: Jeff Balchin from PricewaterhouseCoopers here at the request of Christchurch Airport and Powerco.

MR GOODEVE: Paul Goodeve from Powerco.

MR GUTHRIE: Graeme Guthrie from Victoria University for Telecom.

MR REDMAYNE: John Redmayne from PricewaterhouseCoopers with Telecom and also a group of electricity distribution companies that PwC represents.

MR SRZICH: Anthony Srzich from Telecom.

MR NEWTON: Troy Newton from KPMG representing MDL.

MR GRAY: Don Gray from MDL.

DR MARSDEN: Alistair Marsden from University of Auckland representing New Zealand Airports Association and Auckland International Airport.

PROF VAN ZIJL: Tony van Zijl, LECG, representing Wellington Airport and ENA.

MR FORD: Sean Ford from Air New Zealand.

MS COOPER: Kristina Cooper from BARNZ.

DR LAYTON: Brent Layton here at the request of BARNZ and Air New Zealand.

MR INGHAM: Russell Ingham working with the Commission.

DR LALLY: Martin Lally again advising the Commission.

CHAIR: I'll hand over to Pat.

COST OF CAPITAL FRAMEWORK

MR DUIGNAN: Good morning. What we're doing in this first session is to canvass the wider issues regarding the cost of capital and that we will be, later in the session, turning to the question of firm-specific approaches versus industry approaches, and my colleague Commissioner Mazzoleni will be covering that and chairing that discussion.

We have provided the straw man earlier, and as a complement to that material I have today had circulated this morning the application of the straw man to two different capital asset pricing models, namely the simplified Brennan-Lally model and the Classical model, so you will have that in front of you. And while it is particularly useful to inform the discussion later on leverage I think it is also relevant to this discussion because it does rather bring to us the actual application results as opposed to what happened sometimes when these matters are discussed entirely in the abstract.

We have had a wide variety of submissions regarding the broad issue of how the Commission should approach this task of deciding on the cost of capital to use in the purposes of Part 4 and also for other purposes under the Commerce and Telecommunications Acts.

The history, as you're all aware, is that there has been a very extensive study by the Commission assisted by experts of this topic and the period has generated a wide range of submissions. I'm more than happy for references to be made to earlier discussions but would stress that the Commission has now received the experts' opinion and so that the earlier discussions regarding that are to some extent sort of captured.

Without more ado I will now turn to provide the opportunity for the experts but

also company representatives to assist us, the Commission, by perhaps defining a little bit more precisely where, having seen the various submissions and having had the opportunity to consider the cross-submissions, the actual results of thinking about that have led them to.

The tenor of some of the submissions has been that the Commission should use a wide variety of methodologies for the cost of capital, in other words a range of models, but I think that it's fair to say that there are significant limitations upon the actual practical ability to apply certain of the possible models.

And so my first question essentially is to ask as background before I come to the specific, that you address your remarks to that issue of what is the actual practical possibilities here. I would just also stress that as we are all aware New Zealand does have a taxation imputation system which does distinguish it, in fact makes it one of a relatively small number of countries that are currently implementing imputation, and that that does suggest that some account needs to be taken of that aspect as opposed to simply picking up consensus models from overseas.

So if I could now ask the experts on this broad question of the choice of models and specifically whether the view is that there should be just one model applied, which is essentially what the experts' panel have advocated; or whether if you are of a view that the Commission should be applying or looking to a number of models would you please then indicate how that would be applied in practise and also your judgment on the extent to which in the New Zealand context the data is actually available.

If I could begin on this side of the - on the left-hand side of the table please. Just to explain, if we go around the table, I'm particularly asking at this point for the expert advisors' views, but I'm happy for the company representatives to offer their views also.

MR HOOGLAND: No particular view so -

PROF BOWMAN: I'm not a fan of am application of the Brennan-Lally model and believe we'd be better off applying the model that's used in Australia, partly because I think it's a sensible model and partly because of the advantages of conforming with what's done over there for regulatory purposes, and I would be opposed to multiple models unless it was very clear how that would be accomplished, otherwise regulatory risk just becomes a significant problem.

MR DUIGNAN: I take it you're referring to the Officer model?

PROF BOWMAN: Yes.

MR DUIGNAN: There are some questions regarding that specific model. I'll juxtapose one if I might and then we will give the opportunity. The Officer model is adapted to the actual Australian taxation system where in the detail the Australian imputation credit has got a different actual effect than the New Zealand imputation credit in a number of respects. For example, the New Zealand imputation system includes the supplementary dividend system which does offer some direct benefit on a continuing basis to a range of overseas shareholders.

So I'd be interested perhaps later to sort of just hear more about whether you think the Officer model can be satisfactorily applied in New Zealand or whether in fact if it is applied and the parameters of it are worked out reflecting the New Zealand system you would end up with something quite close to the Brennan-Lally model, but we can explore that later. So perhaps if I just give you an opportunity to respond to that and then we can get the other views.

PROF BOWMAN: I just don't think there's anything that's intractable there.

MR DUIGNAN: Okay, thank you.

MR SHELLEY: I think there is a range of models there and the expert report mentioned a few of them. I would want to put a big black cross against the Dividend Growth model straight away simply because when it's not the firm that's applying it it's open to all sorts of optimistic assumptions about the future that the firm or the industry might not hold, and so you open it up to potentially the whims of policy makers at the time, and it's based on assumptions about the future rather than necessarily hard data. So I'd say we want to definitely set that aside as one not to follow.

And from there I would differentiate between the cost of capital guidelines and perhaps an input methodology. For an input methodology I think you really want to go to a single model again to remove the uncertainty issues, but the cost of capital guidelines should perhaps allow more flexibility for when an industry's being looked at that different models can be considered, particularly something like - I think the opportunity to explore a Fama-French model should be left open. Certainly my colleagues from CRA in the UK have built one for mobile telecommunications. And really they found that the issues involved in constructing it were a little more complex than looking at all the data required for, in their case, a Classical CAPM but a lot of it wasn't that much more complicated and there may be situations in which something like that is warranted. So leaving the guidelines open to include a range of models I think makes sense there.

In terms of what you're looking at for input methodologies I don't have a strong preference personally between Classical and something like the Brennan-Lally. I think it comes down to a lot of times as to how you model the cashflows that the CAPM, particular CAPM is applied to, so that's where I am.

MR DUIGNAN: Thank you. Do you know, though, of any actual practitioner applying the Fama-French model in New Zealand or to New Zealand data?

MR SHELLEY: In New Zealand, no, I haven't seen an application.

MR DUIGNAN: Thank you.

MR IRELAND: I think that the Brennan-Lally CAPM formulation should be stuck with if possible because it has been critiqued over quite a number of years and it's well used in the whole of New Zealand community. To go down another route would probably - there'd have to be a good reason for that. Brennan-Lally is relatively simple, easy to apply, and I think to understand. I have a reservation in terms of assumptions on tax neutrality, whether that's necessarily reflected in WACC, but that's for another session.

MR DUIGNAN: Thank you.

MR BALCHIN: There were sort of two parts to the question, one of them was the big picture models, is it CAPM, is it something else and how might you sort of take account of that something else. The second one is then within probably any of those models how do you deal with personal tax differences between, say, New Zealand and the rest of the world.

On the first of the issues, I mean it certainly is the case I agree with some of the comments in the straw man example, that we're trying to arrive at a price for something that you can't observe, so you've got no option but to make use of capital market data that needs to be interpreted through some form of model that's logically consistent. So we're dealing with something that's unobservable, we can only estimate it, so that needs a model.

My observation is across Australia and New Zealand that the Capital Asset Pricing model is certainly the most used model and it's well understood by practitioners in the industry. So in terms of a mainstay, in Australia it certainly is the mainstay, it's the most dominant used model certainly across most valuation exercises and certainly amongst the Regulators.

We need to bear in mind, though, that the CAPM is - it's a simplification of the world. We know with the CAPM it actually is quite a significant simplification, it has some well-known quirks, and we also know its empirical performance is rather mixed.

We know it doesn't - it tends to under-predict the required returns for low beta stocks and over-predict the returns for high beta stocks and it probably has other quirks that hasn't been picked up as yet as well.

So there is a need where possible to draw on other sources of information to cross-check the outcomes of applying this model. So to be clear, I always advocate applying models in a logically consistent fashion, but you need to cross-check that and use that other information to the best of your ability to guide your decision on parameters within the CAPM.

In terms of the other models that are around, the Dividend Growth model I think right at this moment is very hard to apply anywhere. Dividend Growth model works well when you have firms in a stationary type situation where you can talk about stable levels of dividend growth over the years. With the recent sharemarket ructions it's actually hard to talk about stable activity in growth because it's quite uncertain the dividends that some utility firms, particularly in Australia, expect to pay over the sort of medium term. Five years time it may possibly go back to that, or a few years time.

But one of the problems with applying the Dividend Growth model to individual stocks is that you need a robust basis of forecasting growth and dividends per share. I understand in New Zealand you might only have one or two analysts following some of the stocks, so it's actually hard to get a handle on that for New Zealand because you'd have to say that's not a very large sample. In Australia we have a similar problem, we don't have that many analysts following stocks.

In the US, however, the Dividend Growth model is the mainstay of regulation, it is the standard tool applied by Regulators there for cost of capital, it is used more often than the CAPM. So I think it's possible to, say, look at the US and draw some inferences as to how the CAPM performs against, say, another logically consistent model, the Dividend Growth model.

My observation is a couple of things. The Dividend Growth model at times tends to predict higher returns but what it certainly does predict is more stable returns than under the CAPM, it doesn't predict returns that go up and down one for one with interest rates. So there are some generalities that can be drawn out from that that may be useful in refining your opinions on cost of capital on average or at particular points in time.

The other model that's been talked about is the Fama and French model. That's a model that I'd note that most - a lot of the finance academics don't like because it doesn't

have a rigorous basis in finance theory. I mean some detractors would say that the factors that Fama and French found were nothing more than data mining. But the fact is that those factors have been found to explain returns for different periods of time in the US market in different markets.

So the fact that those factors are - seem to have such a systematic effect, explanatory power for returns, suggests that there's something behind them. I've recently - the ability to apply the Fama and French model in any market, though, is dependent on having historical data on the Fama and French factors. The most important one is what they call the high minus low factor, which is the ratio of the book value to the market value of stocks.

I've recently co-authored a study with NERA who seem to have escaped these two days here, applying the Fama and French model to Australian utility stocks for a price review that's in progress in there at the moment. We managed to do that in Australia because dimensional fund, which is an offshoot of - which is something that Kenneth French, one of the essays the Fama and French is involved with, has established a data set in Australia that goes back about 30 or so years, it might be slightly longer, establishing these factors.

What we found was returns under the Fama and French model which were quite - which were plausibly similar to the CAPM but slightly higher than the CAPM. What it did show is that the Fama and French factors, particularly the high minus low factor was quite important for utility stocks, it is something - so whatever that factor proxies, some people may say it's a proxy for recession risk, and that seems to be quite plausible to me. But that's an important thing for utility stocks.

So I suppose the point I'm making is the application of that model, even if it can't be applied in New Zealand, the application for that model elsewhere is something that you can use to refine your ideas about whether the CAPM is likely to be high, low or otherwise for these particular types of stocks. I haven't done a big study about the application of the Fama and French model on US stocks. That would be an interested piece of work because it's something you can apply to the US, there's a longer time series over which these factors are available; and certainly the Fama and French model is something that's well-known over in the US.

And the third thing in terms of models, I mean what I've tried to emphasise is that we have to apply models, but applying any model there's an element of judgment and we

need to draw on whatever we can to inform that judgment. In working for Regulators over the years, I mean I've both advised and sort of myself been informed by views of informed market practitioners. I would suggest don't write-off the views of the broader investment community.

It's certainly the case you need to interpret their views within the framework from which those views are arriving; i.e. there may be a tendency for some people to talk their own book. But certainly there is information that can be gleaned from sort of informed members of the finance community. And in Australia certain Regulators have had quite good links into the finance community, been able to work out, you know, what the broad feeling across the investment community is for where Regulators are heading, which at times has been very useful for Regulators trying to put a handle on where they should sit within a plausible range.

Because one of the problems with applying the CAPM and other things is we're coming from - you're dealing with a set of facts where two practitioners, expert practitioners at any point in time can look at the same evidence and come up with economically materially different answers, so there needs to be some way of trying to narrow that gap. And my sort of plea is to look at the broadest class of information you can to do that.

Turning to the second part of the question, the personal taxation effects. This is something I'm less expert on in the New Zealand economy, have sort of been more familiar with Australia. My understanding is the Brennan-Lally model is fairly well applied over here, it's used by PricewaterhouseCoopers, John Redmayne can talk about that more generally, for its own valuation exercises. And so certainly as a starting point you'd have to say that's a starting point.

I mean we should recognise, though, that the CAPM does have, as I was emphasising, some well-known faults. One of them is the tendency to under-predict the returns for low beta stocks. My concern about the Brennan-Lally model is that this treatment of personal taxation, even if it's correct, it does tend to - would tend to worsen that problem rather than to fix that problem.

The Classical model has a flatter line, flatter relationship between - or a flatter predicted relationship between beta and returns. So to the extent that there is a problem within the CAPM you'd have to say that would be pushing the return in the correct direction. But in terms of a model that you'd use as your first choice before it was road

tested I think that would have to be the appropriate model for here.

Looking over at Australia the practise is actually more mixed than people suggest. The Officer model is widely used by Regulators. It's probably less widely used by the finance community now, it's not the - the PwC valuation practise typically use a classical tax approach, meaning they don't often apply benefits through franking credits. Independent expert reports typically ever, or hardly ever attribute benefits to franking credits, they typically use a Classical CAPM.

But even within PwC's own practise that's not a unanimous practise. They sometimes attribute value to franking credits, sometimes value things using both a Classical and an Officer CAPM and disclose the valuation that franking credits have, so it's a half-way house between the two. So at least they make it clear and disclose what value, additional value the stock is actually coming from applying this version of the CAPM.

MR DUIGNAN: Thank you. There's a wealth of interesting points that you've made there, so we'll return to some of them. I'll flag up one just to say I'll return to it, and so I don't want to specifically focus on it now, but just so the others know; the low beta and the Brennan-Lally model and whether there's a difference between where beta is being affected by leverage versus the basic asset beta, so I come back to that. So I think I'll invite the next expert.

MR GUTHRIE: I think the point that the Commission needs to remember all the way through this is that what it's trying to do is to estimate a market determined cost of capital. And one problem I've had with the work the Commission's done over the years is that it seems that its focus has been on coming up with the most accurate estimate of what a particular version of CAPM says that that cost of capital should be.

That's an interesting academic exercise but it's not actually - it's not the question that should be asked, which is what is the market determined cost of capital. And the standard CAPM is one attempt to answer that question, but there are all these various other models that can be used as well. And whichever model you use, at the end of the day the question isn't what does that model predict, it's what does the market say that the cost of capital should be; and so if there are empirical failures in the CAPM that needs to be accounted for at some stage.

Now I can envisage a long discussion here about the tax assumptions behind various versions of the CAPM and we've seen some of it already. And arguably that's an

interesting intellectual discussion but actually I don't think it's the question that the Commission should be asking. It doesn't matter whether the model has more realistic assumptions than another one, what matters is that it performs better than other ones.

And we've already heard some comments here today that the CAPM has some problems that are actually exacerbated when you go to the simplified Brennan-Lally CAPM. If that's the case, it doesn't matter whether the tax assumptions are better, if the performance of the model is worse then really you shouldn't be using it.

So I think that's a question that - the Commission needs to ask the right question, which may lead it towards different answers, I don't know.

MR DUIGNAN: Could I just intervene there to say that when you pose the question that way it sort of pre-assumes that there's some other way of knowing what the, shall we say, the truth of the matter is. So could I put it to you that your comment doesn't actually provide the necessary guidance because the issue at the end of the day is, as has been indicated, is that one must use a model. You seem to be suggesting that there is a sort of model free way of getting to the true cost of capital, is that what you meant?

MR GUTHRIE: No, I'm not suggesting that, I'm suggesting that these various models are all different ways to answer that question. And if you eliminate the models, if you eliminate all but one model right at the start then you're potentially eliminating a lot of useful information. If you have five models that give five different answers, that will give you presumably a better idea of what the true cost of capital is than if you throw out n-1 of those models right at the start.

So I'm not saying you shouldn't use a model, I'm saying that there is benefit in having access to the results of more than one model. Having said that, for the input methodologies situation I'd agree with the comments before, that there's real benefit in having most of the analysis based on an agreed model that doesn't change from one cycle to the next so that people can predict what's going to happen.

I'm certainly not suggesting that every time you set a cost of capital you run half a dozen different models and come up with an answer, but I think that having run its model the Commission needs to realise that that model is giving a prediction of what one specific model says the cost of capital should be and it needs to be aware that there are other models out there that when they've been applied overseas show that you can get quite different results when you apply different models.

Perhaps I'm pre-empting the discussion that's going to take place tomorrow about

choosing an estimate within the range, and the different models contribute to an understanding of how wide that range of possible estimates is going to be.

MR DUIGNAN: Just on that, you're familiar of course that the Commission has consistently chosen an estimate that is above the -

MR GUTHRIE: Yeah.

MR DUIGNAN: - shall we say the mean of the results of applying the available parameters.

MR GUTHRIE: Right.

MR DUIGNAN: Which is in a way, I mean the Commission I think in the past, and of course I've only been here since June so I'm not speaking of myself, has seen itself as in fact responding exactly to the point you're making by that approach. I just wonder if you'd like to comment upon whether you see it that way.

MR GUTHRIE: I think in principle it has, but the question is how wide is that range going to be. And I think the Commission has perhaps overestimated its ability to get a precise estimate of what that number should be. My view would be that when the Commission has set a range of plus or minus 1%, maybe that should have been plus or minus 2%, and if the Commission had thought about all of the different models and all of the different predictions that those models give, it might have been a little bit more cautious about saying that it's got such a precise estimate. So I think in principle the Commission is doing the right thing there, but I just think it's been a bit optimistic about the performance of the model that it's used.

MR DUIGNAN: Thank you. Could I just comment that in terms of choice of models I think that past Commission discussions on this have put quite a lot of weight upon what it is perceived that practitioners in the New Zealand market, and I include both corporate finance people in corporates and equity analysts, have been perceived as applying. And so I think that has been a significant part of the decision process leading to the choice of model. There is, for example, a survey of New Zealand CFOs that was completed some time ago that shows in fact a higher percentage rely upon the CAPM in New Zealand than in the US, just as a case in point. I'll offer you the opportunity of any further comment and then we can move on.

MR GUTHRIE: Just the one thing I'd say about those surveys is that there's two different issues there; one is how do you estimate the cost of capital and the other one is what do you do with it? And quite often when you run those - there's one going back 20 years, they may well use a particular model to calculate their cost of capital but as soon as they go to

calculate a hurdle rate for an investment they add on some sort of premium presumably to make allowance for all of these shortcomings of the CAPM. So using the CAPM, a particular version to calculate your cost of capital isn't necessarily the same thing as using the CAPM to calculate your cost of capital to then set it equal to a hurdle rate and make investment decisions. That's the only thing I'd say on that.

Otherwise I think the only thing I'd like to add is I'm as nervous about using the Dividend Growth model as everybody else. I think it offers all sorts of potential - for the results to be very sensitive to assumptions and I think that's got all sorts of problems if you go down that road.

MR DUIGNAN: Thanks very much. I would, if I might, just comment that having been in the position of setting hurdle rates in a corporate for Telecom there is the point that in reality those rates are used for more speculative projects because the nature of any corporate is that most investment projects of a day-to-day nature do not have to go through that sort of sifting process, and that the process of adding margins on to rates often has, I don't say always, but often has an element of sort of a rough and ready way of countering what I might call Project Manager optimism, which I think we could talk further about, so thank you. Could I move on.

MR REDMAYNE: Firstly just addressing the practical application of different models, I think that's really a question of being able to come up with various parameter estimates. And just running through the models that have been considered in the experts' report, the Classical CAPM I think is the easiest to apply in terms of coming up with the parameters. The second one after that would be the Brennan-Lally, there's some additional parameters for taxes but here in New Zealand I guess, you know, we've come up I think with reasonable estimates for those parameters.

The third specification is the international CAPM and I think that one is quite a lot more difficult to come up with parameters in terms of what is the market risk premium, how you're going to measure the betas, you know, what currency are you going to denominate the risk-free rate and these sorts of questions. So in my mind that one becomes a lot more difficult.

The Dividend Growth model, I think that is something you could try to apply in New Zealand but I think, as Jeff Balchin has said, there's some very thin forecasting out there from analysts, so I think that would make it problematic; and on top of that there is the problem with that model that it's highly sensitive to the long-run growth assumptions.

So I think in terms of applying that to New Zealand data that's probably not a starter. However, it may be informative to look at the results from applying that model in other countries, for example regulated utilities in the US or whatever. I've not done any work on that area but I could see that might be a helpful reference point, vis-à-vis the CAPM.

And the final one was the Fama-French three-factor model. I've not seen that applied in New Zealand, and again I think there would be data difficulties. You have to estimate three premia and three factor loadings or betas on those and I think that would be quite hard to do. However, you might still find that that is a useful comparator using overseas data. So that's my comments on practical application of those models.

In terms of the second issue which is accounting for New Zealand taxes, I guess that really narrows down, in my view, to comparing the Classical CAPM to the Brennan-Lally CAPM. And if we look at taxes alone, I think the Brennan-Lally CAPM does a better job of trying to deal with the New Zealand tax environment.

However, I think that's subject to a very big caveat and a couple of people have already noted the point and we've put it in some of our submissions, which is that the CAPM fails to explain returns when you look at historical returns for large portfolios of companies and in particular low beta companies have higher realised returns than what are predicted by the CAPM. And the territory where the submission is typically regulating or looking at is low beta companies.

So as soon as the Commission starts to use the CAPM I guess we have to be aware that it is probably understating the returns that are expected in the market or would be realised in the market, and the problem with using the Brennan-Lally CAPM with low beta companies is it makes that problem a lot worse. So basically we take, if you like, a bad model, we mix up the tax things but we then make the bad aspect of that model worse.

MR DUIGNAN: I was interested in perhaps, since it has now been aired a couple of times we should put it on the agenda immediately, that there's been reference to the Brennan-Lally model exacerbating the issue of low beta modelling or modelling of low beta companies, and I just want to understand whether in fact the point about the Brennan-Lally model is that it, as per the graph that you have in front of you, it shows lower CAPM for a low level of leverage, and the low level of leverage for a given asset beta of course is a low beta situation.

But it seemed to me that there was a question which I personally haven't seen any

specific discussion on, as to whether the Brennan-Lally model itself exacerbated the whatever problem there is with the CAPM regarding low beta companies. It isn't obvious to me that because the Brennan-Lally model has a different process when you have leverage that that - and in particular that for low leverage the cost of capital goes down in the Brennan-Lally model as per the graph - that that necessarily meant that it was exacerbating the issue that you have spoken of, namely for low beta companies, you know, not where beta is low because of the leverage matter, but where beta is low because intrinsically the company has a low beta.

So that's a somewhat technical matter, but I just wanted to say in fact that was the next issue that I was going to come to, or perhaps immediately after one other question. So I'm just really registering for the other experts around the table that I'd like to come back to that, unless you want to give an immediate comment John.

MR REDMAYNE: I think I would see the two things are interrelated but there are separate issues there, which is that if you think about it in simple terms, with the Brennan-Lally CAPM you're using a higher market risk premium and in effect you're using a lower risk-free rate because the risk-free rate is expressed on an after tax basis.

So just looking at that in isolation of the leverage question, as soon as you plug low betas into the two models if they're giving the same cost of equity for the average company in the market with an equity beta of 1, once you but in a low beta, once that number gets below 1 you're going to start producing lower cost of capital or cost of equity estimates using the Brennan-Lally model. So that is independent leverage, but you have got a leverage issue that you want to discuss and the two will interact to some extent, but it is a separate issue on its own right.

MR DUIGNAN: Right, we'll explore it in due course, thank you.

MR NEWTON: I guess we would agree with much of what's been said about the quite sensible notion that you need to have cross-checks. As a practitioner I wouldn't enter into any form of valuation or assessment without cross-checking and using alternative models to get some guidance insight into whether what I'm producing with one model is making sense. So that makes a lot of sense to me that you, as the Commission, do seek to take into account what other models are saying.

KPMG typically applies the Brennan-Lally formulation and so we're quite comfortable with it from a practitioner's point of view. And I guess recognising some of the limitations in having suitable data with other techniques we'd be inclined to the

Classical CAPM as a supporting cross-check, and I'll leave it at that.

MR DUIGNAN: Thank you.

DR MARSDEN: I also support the Brennan-Lally CAPM as an acceptable model in New Zealand. I think it fits in with our tax regime and to that extent it's better than the Officer model. But I think that as comments have been made what we're trying to do here is get a market cost of capital, and particularly if we're in an information disclosure environment we don't need to be unduly specific.

To that extent then I think that using the Classical CAPM as an alternative is a good idea, remembering that we need to also take into account or think about model error in addition to parameter error. And to that extent I think that using the Classical CAPM comparing to the Brennan-Lally CAPM enables us to examine what is the impact of these tax assumptions or leverage effects.

In respect of the alternative models I see a lot of difficulty applying any sort of Fama-French model or Dividend Growth model, and I also have my considerable doubts about the feasibility of the international CAPM.

MR DUIGNAN: Thanks. So just in practise does that indicate that you think that the most attention ought to be to the results of the Brennan-Lally model with the Classical as a sort of a cross-check?

DR MARSDEN: Yes.

MR DUIGNAN: Thanks.

PROF VAN ZIJL: The essential problem, as other people have already mentioned, is that we're trying to measure something that we can't measure directly and so we do need a model. And of the various models that could be considered I think that the Capital Asset Pricing model has a lot to recommend itself in the sense that at least it's based on a sensible idea that investors are not rewarded for holding unsystematic risk, in other words risk that could be eliminated through diversification.

In terms of choice of Capital Asset Pricing Model, given that we can't directly test the model, we do need to look at the assumptions. And if we focus just on the assumption of tax rates then clearly the model that the Commission has been using in the past is an attempt to mimic the tax structure that applies in New Zealand, whereas in contrast, for example, the Classical CAPM assumes either that personal taxes are zero or that at least these taxes are neutral, and that isn't the case in New Zealand.

So the choice between those two, I would favour the model that's currently used

by the Commission. The international CAPM I think is just too difficult in terms of estimating the parameters. However, the model of course is a high level abstraction from reality. The parameters, some of them are perhaps at least in principle relatively easy to estimate, but in particular the market risk premium and the beta co-efficient are very difficult to estimate. And so we do need to allow in estimating WACC to make allowance for parameter error and we also separately need to make proper allowance for model error in the sense of the model being an abstraction from reality and therefore missing out on some key factors that are present in reality.

In terms of other models that could be considered, well people do mention Fama-French but Fama-French ultimately just boils down to the data dredging, and is therefore going to be specific to particular time periods, commercial environments, it really hasn't got a lot to recommend itself. It's been put forward in the finance literature largely as a reaction to the fact that it tends to test the Capital Asset Pricing Model, in particular the Classical form of it, by reference to realised rates of return has tended to suggest that the CAPM doesn't work too well.

But really all those attempts to test the CAPM in that way are really a bit of a waste of time because they're all dependent on ability to identify the market portfolio in the sense of that concept as used in the CAPM. And so if you do go out and test the CAPM against realised returns, you're really just, in my view, engaging in an exercise that would give you significantly less benefit than maybe going off to the beach or reading an interesting novel or perhaps going to the movies.

As a cross-check, well you could use something like the Dividend Discount model, but that suffers from the difficulty of estimating the time path of dividends into the future, and of course you get wildly different results depending on what sort of assumptions you make about that time path. I think if you're interested in a cross-check probably just something very basic and simple such as the interest rate paid on debt by the relevant entity, and clearly that's going to be less than what the cost of equity might really be, but at least it kind of sets a floor level for what the cost of equity might be.

There has been mention of the Officer CAPM, well analytically the Officer CAPM is equivalent to the model that the Commissioners favoured, it just deals with the benefits from imputation in a different way.

MR DUIGNAN: Thank you. Just a couple of aspects there, just one that the New Zealand policy makers would argue I think that the New Zealand tax system introduces neutrality

as opposed to the application of the Classical model and just your - I think it's the way you worded it, it came across that the Classical model assumed tax neutrality, whereas I think it's fair to say that the Classical model actually assumes that there's double taxation of, well, of returns to equity as normally interpreted. And so I just wanted to confirm that you'd probably agree with the characterisation of an imputation system as being more tax neutral between the two different types of capital, debt and equity than the situation that the Classical model applies to.

PROF VAN ZIJL: The imputation of course just gives one round of taxation on company income and so you can regard the system as being neutral in that sense, but I was using the word 'neutral' in respect of the CAPM to mean that the tax rates on dividends and debt were equal.

MR DUIGNAN: Within the model itself, yes.

PROF VAN ZIJL: Yes, yes, so that, for example, the Classical CAPM often in the textbooks is talked about as being assumed that personal taxes are zero, but it's not necessary to assume that they are zero, it's just necessary to assume that personal tax rates on dividends and debt are equal.

MR DUIGNAN: Yes, but with the qualification that the interest is deductible at the company level, whereas obviously the dividends are not.

PROF VAN ZIJL: Yeah, whereas of course in New Zealand with imputation that's not the case.

MR DUIGNAN: That's right, exactly. Just one other aspect of your comments, you suggested the interest rate payable by a company puts a floor on the cost of equity, just at a technical level would you agree that that's not at a technical level quite accurate if you are thinking of it in terms of post tax terms because of course the interest rate is tax deductible, whereas the cost of equity isn't. So therefore we can - yeah, so -

PROF VAN ZIJL: Yeah, no, I agree with that. Partly my reason for being reluctant to entertain other models as coming into the picture is that we're not here in the context of trying to suggest rules for making investment decisions, rather the context is regulation in varying degrees, and I think in that context certainty is quite important. So that if say the Commission ended up by saying well we're going with version X of the CAPM but we'll also take into account the Dividend Discount model, and we'll also take into account Fama-French and XYZ and PQR and we're not, however, going to specify the weights that we're going to assign to each of these alternatives, well where is a company left with that sort of regime in terms of predicting what the cost of capital might be set at at the

next rate fixing date? And I think that sort of degree of uncertainty is highly undesirable and so that I would be reluctant to argue for seeing alternative models built into the Commission's regime.

MR DUIGNAN: Thank you, okay.

DR LAYTON: In terms of the cost of equity I favour the use of the Capital Asset Pricing Model, but am happy with the use of both the Discounted Cashflow and the Fama-French three-factor model as cross-checks. On the latter two I recognise that they're going to find it very difficult to cross-check using New Zealand data with both of those.

In the case of the Discounted Cashflow or Dividend Discount model, the issue in New Zealand is often finding a listed company for which you can get the actual traded share price and also at being a sufficiently pure play that you are in fact looking at the regulated component of the industry alone. I don't think the difficulty is quite as great in terms of the dividend forecasting given that you're dealing here with infrastructural firms in the main which do have a tendency, or try to have reasonably steady dividend patterns and dividend growths, and these are not businesses traditionally.

So I recognise you are looking internationally for those, but I'd make the point that even in the straw person example they had to look internationally for comparators for setting some of the parameters. It's an inevitability of New Zealand's thin and skewed - skewed in the sense that it doesn't cover all sectors even that are important in the economy - capital market of the traded capital, that we will start to look at international factors. So I also support the panel's recommendation that the Commission from time-to-time have a look at what is happening in terms of models for the cost of capital.

In terms of the model of a specific variety of the Capital Asset Pricing Model, happy with the continued use of the simplified Brennan-Lally variant for regulatory consistency reasons, it's well set here, and it is attempting to deal with New Zealand's domestic tax regime. But there's a caveat I have, we need to sort out the issue in relation to leverage. That is inexplicable in terms of one's understanding of, you know, how leverage and the WACC should be related in New Zealand and that's an issue we'll address later.

In terms of comparators, I actually would put forward the Commission should think of cross-checking and keeping its eye on the international Capital Asset Pricing Model. The reason I say that is because it's the opposite end of the spectrum in a sense from the simplified Brennan-Lally model. The simplified Brennan-Lally model is based

on the assumption that New Zealand really has a domestic driven tax regime which is dominating our equity market regime. The international is based on the assumption that we have a global investment market.

Now, you could argue about the Brennan-Lally that one of its drawbacks is that New Zealand's equity market in particular is dominated by international parties for whom many of those tax aspects that are incorporated into the simplified Brennan-Lally may not be strictly appropriate.

The other extreme is that again I realise that you have to look at international comparators for using that model, you won't find it, and yes, there are data problems; and that's why I suggested the Commission should keep its eye on that particular result, because there's really the picture - one picture we could have is New Zealand has a domestic capital market and we're looking for cost of capital that's driven largely by domestic tax issues, and the other is we are just a pimple on the side of an international market and largely driven by international factors.

MR DUIGNAN: Thank you, I would just ask Russell and Martin if they had any brief comments just on this broad question. I want to then come specifically to the question of low beta and also a question regarding the international Capital Asset Pricing Model. So if you could just give me any comments very briefly upon the - really upon choices like Dividend Growth models, models other than the CAPM, because we're going to come back to the specifics about the CAPM and the Brennan-Lally model in a moment.

MR INGHAM: Sure, certainly in regards to the model as a practitioner we use the Brennan-Lally in the New Zealand context. Certainly as a cross-check we did also look at the Classical result and the Officer type result but certainly in practise the model we used was the Brennan-Lally.

DR LALLY: One of the great difficulties that any Regulator faces in this area is that whatever number you come up with is almost certainly going to be wrong, either too high or too low; and of course we don't know which of those two possible situations prevails. The things that drive that possibility or virtual certainty of error is firstly that there are inevitably errors in estimating parameters, and the Commission has sought to address that question through the recognition of a probability distribution, a Bayesian probability distribution around WACC, and choosing a value from the upper range in recognition of the fact that underestimating WACC is the more serious of the two errors.

However, there is another source of error which has been referred to by a number

of participants here, and of course is the very subject that we're looking at in this session, and that's model error. We don't know what the right model is. As a financial economist I'm envious of physicists whose models seem to have achieved a degree of empirical validation that we can only dream about in financial economics. And we'll come later to the issue of low beta stocks.

But given that there is a possibility, a distinct possibility of model error, it is desirable to try and address that question; and one way of trying to address that question would be to look at the results from fundamentally different models such as the Dividend Growth model and Fama-French to get some sense about the extent of model error that might be arising.

And if that extent is small then great, but if that extent is large it might incline a Regulator to choose an even higher WACC value than they otherwise would to again recognise the fact that under-estimation is the more serious of two possibilities. And we can't do that with sort of statistical techniques that we can when it comes to parameter estimation error, but at least make some effort in that direction by looking at results from fundamentally different models.

And I say that notwithstanding the fact that I think there are serious difficulties in these alternative models. I'm not proposing that they be used to come up with a point estimate or even contribute in some sort of weighted average fashion to the point estimate, but I am suggesting that it might be useful to look at their results to get a sense about the question of model error.

MR DUIGNAN: Thank you. Well, I'd like to move on now then to a couple of specifics. We've got in front of us a comparison, the Classical and the Brennan-Lally model, and since we can cover that in the session about leverage, that particular graph, but I think that it's fair to say that we do have the capability of applying both those models in New Zealand.

Since the international Capital Asset Pricing Model has been referred to as a model that it's hard to apply but which in principle might be of some relevance, my first quick question and it could be a big topic, the first quick question is my understanding is that the application of the international capital pricing model would be expected to produce a lower cost of capital than either of the others given that New Zealand is a small country representing a diversification opportunity when viewed from an international investment point of view, and that there is work that has indicated that; and I just wanted

to quickly cover whether there was any sort of strong view to the contrary from any of the experts who have looked at the international Capital Asset Pricing Model.

But the major matter that I would like to hear a view on is the issue of whether the Brennan-Lally model's particular characteristics adversely affect a low beta or reduce the low beta CAPM intrinsically where one is thinking of the asset beta versus where one is thinking of the effects of leverage. We can see in our graph in front of us that it's entirely clear that just in the raw application the Classical model reduces the cost of capital or the cost of equity with leverage, and the Brennan-Lally model as applied shows an increasing aspect.

I'm really trying to say let's just leave leverage out of it here, I just was interested if you just focus upon the issue of intrinsically low beta companies where the low beta is because of their asset characteristics. Is there thought to be a particular bias there? I realise people may not have thought about this question, but since it has come to the fore in the discussion I'm just asking for thoughts.

So there are two specific questions, they're somewhat technical, but that's the purpose of this particular session. So if I could start with that.

MR HOOGLAND: Thank you. I think in regard to the international capital models I think the discussion here this morning has essentially said there's two extremes of assumptions; one is that New Zealand is essentially a closed economy, and you only need to have a domestically focused model, or the other is that it's fully integrated into the international economy. The reality is that I suspect neither is the case and it's somewhere in the middle. And this I think is sort of one of the compromises where no particular model is going to exactly reflect the reality of where New Zealand sits.

And I think I've probably got a similar answer on the second question in regard to - I don't have any specific information as to the effect of the understatement of returns for low beta stocks between the various models. There's certainly a degree of empirical evidence around about that, and again this is something I think that, you know, the Commission need to take into account, as I think Martin indicated, that if that is a tendency of the model in both sort of selecting the parameters and selecting the point on the range to take into account that, I suppose, deficiency or weakness in the model.

DR MARSDEN: If I could just make a point on the international CAPM. It's not immediately clear to that me that that would give a substantially lower cost of capital. If I was an international investor I guess one question I would ask is what currency do I want to think

of my cost of capital in, whether that's New Zealand dollars or an international investor I think you'd want to think of a cost of capital denominated in US dollars.

And where I think it makes a difference then if you were to then empirically estimate betas such that if you were to regress returns on, say, the New Zealand market versus an international market in New Zealand dollars, I think you're going to get a lot lower beta than if you turn that question around and say let's take a New Zealand market index, convert it to whatever the exchange rate happens to be, and then regress those returns against, say, a world market index expressed in US dollars. And I think we've got to also remember although international investors clearly play a role in our market there is still a very significant degree of home bias.

So, I don't think that just using, or making the statement that an international CAPM is going to give a lower answer, I just don't think at this stage that we can come to that conclusion at all.

MR DUIGNAN: Thanks, it was a question not - I asserted it that way so that we knew what we were playing on. Just one quick question, so you're suggesting that if you take beta calculated turning everything into US dollars you would expect that because of the exchange rate effect you might find it was higher rather than lower.

DR MARSDEN: That would be my expectation, yes.

MR DUIGNAN: So that the - another way of putting that would be that therefore the New Zealand dollar is kind of - as it may well be, I'm not suggesting I've got a firm view on it - but that the New Zealand dollar is, shall we say, systematic risk rather than unsystematic risk viewed from an international investor's point of view; it doesn't represent diversification, it represents a risk - adding to risk.

DR MARSDEN: Well investing in New Zealand is a very small economy and from off-shore investors I would think they would certainly want to price exchange rate risk.

MR DUIGNAN: Okay, yeah.

PROF BOWMAN: I agree with Alistair and I don't agree that we would expect an international CAPM estimate to lower cost of capital here, in part because of Alistair's point, but also the idea that New Zealand would introduce diversification may be true, but it would not hold if you just think of an example if you were to introduce some significant biotechnology companies or oil exploration, very high risk companies into New Zealand, you would expand the diversification; but it would not at all follow that therefore the biotech companies or the oil exploration companies were going to have low betas. So, I

don't think that follows at all.

MR DUIGNAN: Sure, but we are talking about companies intrinsic to the New Zealand economic performance. I mean I understand the point if you just take a sort of company that has no direct connection with New Zealand and put it in New Zealand then you don't change the risk characteristics and it doesn't represent diversification just by changing the locale, but in the - anyway, I understand the points you've made.

It was really just to get a quick view on this because it was - we've all agreed that, or there appears to be general agreement that we're probably not able to apply that model but it's a very interesting model, and so I was taking advantage of this opportunity just to get a view of, if we could, of what the results might be, just an assessment of the assembled experts, but I appreciate.

PROF BOWMAN: Just to make the point in perhaps a different way, pretty much everything we know about markets is that small and risk are highly correlated. There's evidence that that's true with individual stocks, there's evidence that that's true across countries. So I think you'd have to regard New Zealand as being very small both in terms of the market if you think of the market as a whole, but also if you think of the stocks that compromise or comprise the New Zealand market. So I don't think it follows at all that you're going to have a lower cost of capital because of the diversification benefits of New Zealand.

I'd also like to make another point. There's been talk, a little bit of talk here, but more talk in submissions and discussions over the nearly, you could say decades now, of consideration of this. I have a lot of respect for the work of the Brennan-Lally model of both Martin and Alistair being the two main contributors to that. But I think that this issue of segmented or not, segmented market is a bit of a red herring, I don't think that's really the most fundamental point.

The most fundamental point, I think it was Jeff that raised the point about what we're really after here is a market determined cost of capital, and when we use these models we're looking particularly for estimating equity cost of capital, we're looking at the sharemarket as being the arbitrator of that. And so what we really are interested, in my mind, is not whether the market's segmented or not but who are the price setting investors and what are the characteristics of those price setting investors, and you certainly do not require a significantly unsegmented market or certainly not a fully open market to have the price setting investors being something other than New Zealand domestic tax paying investors.

MR DUIGNAN: Thank you. Chair at this point we are scheduled to have our morning tea break and I don't want to hold people from that, so although it is slightly unfortunate we will resume the discussion at this point when we resume. Thank you.

Adjournment from 10.32 am to 10.56 am

MR DUIGNAN: Right, we'll reconvene thank you. First just if I could mention that part way through this session I will be handing over to Commissioner Mazzoleni when we pick up the issue of the firm-specific versus industry approaches. Secondly, could I just ask when you make your comments if you could now please just identify yourself briefly at the outset just to assist the stenographer, and finally if you speak into the microphones it does help the stenographer as well as the rest of us.

We're part way through covering two topics, a very brief comment that I was seeking on whether there was a view about the effects of the international Capital Asset Pricing Model; and as I explained the reason for seeking that view is that since its generally agreed that we probably don't have the parameters I was interested in the experts' view as to whether there was any systematic or rather identifiable relationship between the results of such a model versus the results of the Brennan-Lally or the Classical CAPM which we are able to produce specific results from.

And I was hoping for just a brief discussion on that and then, and I'd invite both to be covered actually in this round of questions, or answers, the question of whether the references to the Brennan-Lally model exacerbating a low beta issue was really that just related to the effects of low leverage which we will talk about later or whether there was that there was some additional matter regarding low asset beta situations that the Brennan-Lally model was thought to exacerbate. So with those remarks -

MR SHELLEY: First of all on the international CAPM I recall reading a study that was produced on the large western markets, so Germany, the UK, the US, I think Japan was included in there, and it was an international CAPM study, and once exchange rate effects were included in the model the international CAPM was a better predictor of actual returns than when the exchange rate effects were left out.

So in the context of the discussion that CAPM in general under-states returns for low beta stocks and over-states returns for high beta stocks, that suggests that once you move to a CAPM framework and include exchange rate effects an international CAPM

with exchange rate effects, some of those biases are corrected; not hugely but they were to an extent. I can't remember the reference to the study but I'll see if I can find that.

The other thing on the international side of it, is when we are setting the cost of debt we're looking at a New Zealand risk-free rate which is not set independently of international investors and when we're thinking about the returns that providers of debt require, that's not independent of international investors.

So on that half of the CAPM we're assuming that markets are what they are, partially integrated. And we can do the same on the other side, we don't have to go for the straight simplified Brennan-Lally, we could have an assumption where we look at the weight of international investors or we could do what Professor Bowman was saying and look at the price setting investors; those are two possibilities.

In terms of your second question on how the Classical CAPM and the simplified Brennan-Lally CAPM deal with low beta stocks, just the issue that people are raising is that when - it is most easily illustrated by setting beta to zero; when you set beta to zero the Classical CAPM says the cost of equity is equal to the risk-free rate. When you do it with the Brennan-Lally model it says that the cost of equity is equal to the after tax risk-free rate. Now, you might possibly be measuring slightly different things there, but that's where the effect is most easily demonstrated.

MR DUIGNAN: Just the - I just mention one thing that I think is interesting regarding New Zealand's international role, that as at 30th of September, which is the date that I happen to have data for, New Zealand credit default swaps in international markets were less than that of the UK; and it's just an interesting reflection that that is a market rate regarding the risk of New Zealand and that the fact that New Zealand is coming in that category is an interesting reflection on perceptions that sometimes New Zealand is always to be viewed as very high risk. Thank you. If I can move on.

MR IRELAND: I would just like to throw in a comment in regard to the low beta issue. And if I take a market view and essentially observe what's happening in the market in respect to what it might say about the rate of return that the Commission is setting based on Lally-Brennan, I only have to go to have a look at a multiple of ODV and I find observed in the market multiples at least 1.5 and above incidentally both in Australia and New Zealand.

And that's actually saying to some degree that, and I know there are many factors that go into that and there have been long debates about that in the past, but it certainly

doesn't suggest on the face of it that rates are too low, because why would $1 of capex, if you like, get up to $2 of market value. The Babcock & Brown independent report published this month in the Horizon Energy independent report summarise all the data in that.

MR DUIGNAN: Thank you.

MR BALCHIN: Thank you. Turning first to the international CAPM, this is something that's been debated somewhat in Australia about whether the numbers would be higher or lower, and it's fair to say debate still goes on and there's no final consensus to it. I mean the proposition that the number would be lower relies on a couple of assumptions or propositions. One is that the beta for New Zealand stocks will be lower against the world market than it is against the domestic sharemarket.

Now that need not follow as a matter of logic because we know that under the CAPM by construction the average of betas across all firms is still going to be 1 whether you apply the domestic CAPM or the international CAPM. It may well the case that some New Zealand firms have lower betas against the world market. Some may have higher betas, some sectors may have lower betas, some may have higher betas. For example, your high quality food production sector here may well have a higher beta against the world sharemarket than against the domestic market. So that's an empirical question and I don't know what the answer to that is, but it should be left in the empirical to be tested bucket.

The second proposition is that the market risk premium would be lower under an international market than it is again under a domestic market. What that assumes, though, is that the market risk premium we have is a pure market risk premium for a segmented market and it's not affected by any sort of internationalisation. If we actually do have assets set with respect to internationally diversified portfolios then that would be reflected in at least today's ex-ante estimates of the market risk premium in New Zealand.

And in that context applying a domestic CAPM using that market risk premium and domestic betas gives you answers that are reasonably similar to applying an international CAPM with an international portfolio and international betas. And that's a proposition we don't really know. We know a lot about the history of New Zealand in terms of how long it's been open to investment, but in looking at the market risk premium in New Zealand we also compare the returns historically and here to other markets, some of which have had more international - have been open more to international investment,

or for longer periods of time, and therefore arguably those estimates are more affected by internationalisation to the extent it has occurred. So I think I'd put that into a difficult to answer or to unambiguously answer sort of bucket as well.

Number three as has been mentioned here is the question of how - what's the price of exchange rate risk and there are different models of - ICAPM models. The easiest one to assume that it either doesn't exist or that it's not priced. The more complex ones have a series of other factors to deal with exchange rate risk. We don't really know what the outcome of that would be unambiguously for assets held in New Zealand.

And the fourth point I'd make is, and just to reiterate the point that's been made by a number of people, before you sort of jump to applying the international CAPM model you have to be satisfied that the conditions for it actually held in the first place, which are that asset prices are set with reference to internationally diversified portfolios of assets. And if you look across any of the major markets we know that investors there's a dramatic bias towards holding assets your own market. That's the case in Australia, I understand it's the case here in New Zealand, certainly the case in the US.

So that evidence or that sort of qualitative evidence in effect, I suppose, lends support, would suggest that the conditions for applying a strict ICAPM in New Zealand probably don't hold in any event, at least without further inquiry.

MR DUIGNAN: Thank you very much.

MR GUTHRIE: I think in terms of the international CAPM, I don't have an answer to your question but I think what's come up is that actually there are two questions. One is what would an international CAPM predict. The other question, I do think it's the more relevant one, is if asset markets were integrated, what would the market determined cost of capital be. And we do seem to be going down this line again of focusing on what a model would predict rather than what the actual market determined rate is. I don't have an answer to either of those questions, but I think it's the market determined question that's the relevant one not the intricacies of how the CAPM would work through.

MR DUIGNAN: Could I just comment then, would you like to comment upon the point that was just made from Ireland Wallace that to the extent you're sort of calling for a direct examination of the cost of capital and presumably direct examination of it as it applies to the regulated companies, the test that was just proposed would, given we do have ODVs, would seem to be an interesting one.

MR GUTHRIE: I think, I'll be saying more about that at 11.45 am when we talk about real

options, because the market value of a firm isn't just the replacement cost of its assets, it's the value of all of these options that come with it, and I think that's a much simpler explanation rather than allowed rates of return being too high.

MR DUIGNAN: Okay, thank you.

MR GUTHRIE: Just one comment about the CAPM and low beta stocks. The empirical relationship between average rates of return and beta is relatively flat. So if you had a graph with beta on the horizontal axis and the expected return on the vertical the graph is not a horizontal line but it's relatively flat. When you go to the standard CAPM that line gets a bit steeper. When you go to the Brennan-Lally CAPM it gets a bit steeper again.

So what's happening is that when you start at a beta equals 1 and reduce beta empirically the rate of return falls a little bit. The CAPM would say it falls a moderate amount, and the Brennan-Lally CAPM would say that it falls even more. And that's what we're talking about here, that the standard CAPM gives a relationship that's too steep, and when you make these tax adjustments it actually makes it more steep, so that we're moving further away from the empirical relationship not closer towards it; and I think that's the point that people are trying to make.

MR DUIGNAN: Could you just clarify whether you were speaking of the cost of equity or the cost of capital when you made that?

MR GUTHRIE: Cost of equity.

MR DUIGNAN: You were talking about the cost of equity?

MR GUTHRIE: Yeah.

MR DUIGNAN: Okay.

MR REDMAYNE: In terms of the international CAPM you noted in New Zealand that may lead to lower cost of capital estimates. I have heard similar sort of comments actually expressed internationally about that model and obviously that can't be correct because on average the cost of capital should be the same, so there must be some firms out there I guess more exposed to international trade - the oil companies, maybe the food exporters and so forth - that should have probably higher costs of capital if other firms are to have lower costs of capital, so I just make that point. In terms of where New Zealand utilities would sit under that kind of model I think that's an empirical question and I don't have the answer to that at my fingertips.

I would note, though, that if we were looking at that model, I mean we're really making a series of assumption. I think Jeff's alluded to some of those, and it's quite a

narrow view of the world. And I for one would say that if you're going to go down that route you would need to consider including a country risk premium, and my colleagues in the UK regularly do that sort of advice for a number of countries around the world. I mean you can't just, well, you can just look at it as an international model and ignore that, but I don't think that lines up very well with what investors are actually expecting once they get into smaller countries.

MR DUIGNAN: There's no proposal, given the points that have been made about the estimation difficulties, it wasn't - it shouldn't be taken that I was suggesting that we would want to apply it, but we just want to understand the point, so -

MR REDMAYNE: I've already commented on the low beta situation, but just to put that in context, the average asset beta for New Zealand companies in New Zealand market is about 0.7, and as practitioners when we're doing valuations we'd typically be ending up with asset betas within the range of, say, 0.5 to 0.9, we wouldn't get much outside of that range if at all.

And so for us it's not really an issue and in addition to that we would always look at cross-checks. So if there's international buyers we'd be using a Classical CAPM, if it's Australian investors we might look at the Officer CAPM, we'd also look at earnings, multiple type valuations and so forth. So we don't totally hang our hat on the Brennan-Lally CAPM.

In the case of the Commission where it's regulating businesses to my knowledge the asset betas are really south of 0.5, have got down as low as 0.2; so I think the issue is much more acute for the Commission than it is for us valuation practitioners.

MR DUIGNAN: Thank you.

MR NEWTON: A number of points well made, and putting my practitioner hat on completely agree with John's comments that typically it's not an issue for us because of the nature of the firms that you're involved in valuing. And to the extent you might have to contemplate external investors and the issues that they face, in particular then you will make adjustments and look at cross-checks using other models.

DR MARSDEN: I've already made my comments on the international CAPM. In respect of the question of low beta stocks I think I'd like to probably just think about that a little bit more, but I can make one comment perhaps on the Commission's graph that they've put out. And it's not exactly clear immediately to me how these numbers have been arrived at; partly because I think if you're using different leveraging formulas you may want to

think about recalibration of asset betas. If you say the equity beta is 1 I'm going to get a different market beta depending on the particular degearing formula that you've used. So it's just not exactly clear what are some of the, I guess, detailed assumptions that have been made in deriving these graphs, to me at least.

MR DUIGNAN: We'll have a chance to talk about that, it's mainly for the leverage session but I thought it was useful to have it on the table now and we'll cover that point then. Thank you.

PROF VAN ZIJL: On the international CAPM I'm not aware of any reliable estimates of the parameters involved, whether it produces a higher or lower result than the model currently used by the Commission, it's ultimately just an empirical question. Whether, however, abstracting from that issue it's a better model to use than the model currently in use, well one could look at the assumptions, and as previous speakers have noted it's probably incorrect to assume that we're a closed economy. On the other hand we're probably also - inappropriate to assume that all investors are perfectly diversified internationally. The empirical evidence suggests there is in fact quite a strong home bias in investment choice, so that on empirical grounds it's not obvious that in fact an international CAPM better describes the New Zealand investment scene than does the model that's currently in use.

In terms of the low beta issue, if we're talking about the observation that the CAPM doesn't work well for low or high beta, well one of the problems there again is that you actually have to measure beta and we can measure beta against various proxies for the market portfolio, but until we learn how to identify the market portfolio it's a bit silly I think to talk about observed betas based on a particular index indicating that the CAPM is either right or wrong.

MR DUIGNAN: Thanks. We are intruding on the time we were allocating for the next session, so I will ask if you focus your remarks. I'm not suggesting people haven't but -

DR LAYTON: Three points. First point is related to the low beta and I'd just remind people of the point that Tony has just made, we don't have an actual return, the market index is particularly incomplete and we don't have the overall, so being able to say that is somewhat difficult. But it is, after you solve that problem, an empirical question.

On the international I would be with Jerry in pointing out it really is the value determining investors that you have to worry about, not home bias, away bias, but it's the value determining investors. My perception is that the value determining investors in

New Zealand tend to be international investors, but that's merely a perception. And that's the limit of the comments I wish to make.

MR DUIGNAN: Right, if I can ask Russell and Martin to sum up really.

MR INGHAM: Sure, okay, well, I suppose really the observation I would make is in general I'm in agreement with what Tony was saying in terms of the international CAPM and the low betas. I've certainly not seen any sort of reliable implementation of the international CAPM, so really I'd just leave it there.

DR LALLY: On the question of international CAPMs the suggestion that they generate lower costs of capital than a domestic model may have come from some work that I have done for the Commission leading to that conclusion. But the work is premised on a number of assumptions and in particular that the so-called Solnik model was used because it seemed to me to be closest in spirit to the model that was in fact being used. However, as a number of speakers have pointed out, there are many versions of the international CAPM and it is conceivable that if you estimated costs of equity using different versions of the international CAPM that you might very well get different results.

On the subject of leverage, the diagram that has been presented to us here which shows the effects of leverage, that diagram would readily translate to a world in which leverage was the same across all companies and instead on the horizontal axis you simply had variation in equity betas being driven by variation in underlying asset betas.

However I would like to make a comment on the question of the empirically flat relationship between the cost of equity and beta. Tony has already commented that that's all premised on the choice of market index, and that's true. But it's also premised on something else, which may be even more significant. And the premise is that your estimates of equity betas and all the econometric work is all done on the basis of estimates of equity betas, we know how imperfect those estimates are. And econometrically, if you have estimation error in the explanatory variable and beta is the explanatory variable in these kind of diagrams, then of course the relationship will look flatter than it actually is. That is a standard econometric result.

So the fact that the relationship looks flatter than the model would indicate is not a surprise to me, and it raises questions about whether the model is the problem, or whether the difficulties in accurately estimating betas are the problem. And I have seen some work which has sought to estimate betas somewhat more rigorously than most of the empirical work that is referenced in this area, and unsurprisingly it shows the relationship

being steeper than is shown in most of the empirical work.

MR DUIGNAN: This fortunately is the topic that we should appropriately pick up in the session regarding beta. So at this point I think we have covered the framework questions pretty adequately. We've heard the views as to what's feasible in regard - and heard views against particular models, in particular that the discretion involved in the Dividend Growth model, and that we're now in a position to move on having had the benefit of the views expressed which we'll be considering in greater detail as we finish our work on this area. So at this point I'll hand over to Commissioner Mazzoleni.

MS MAZZOLENI: I'm going to cover the industry-wide versus firm specific cost of capital, and we are running 25 minutes behind. There were three questions there so I'm going truncate them into one, but before I do that I'd just like to finish off the cost of capital session that Pat's been chairing, simply because we've heard some extremely useful information from all of the experts around the table.

But one thing that I'm somewhat bothered about is what your businesses actually use in practise. So if I could just go around the table to each of the companies that are here and where you possibly can if you can just tell us what model or models you employ to calculate the cost of capital in your own businesses. Do you use one model and do you use cross-checks? What models do you use for those cross-checks and whether they are any of the models that we've talked about today? So maybe could I start with you perhaps Antony and then work around.

MR SRZICH: The finance team at Telecom do calculate a CAPM derived back using the Brennan-Lally model. I think the question, though, you have to ask yourself is what use or how - what purpose is that put to. And I'll just reiterate Graeme's comment earlier, that it's not the dominant factor when making investment decisions. So there are when making investment decisions, which is where cost of capital comes into play, there are other strategic reasons that are taken into consideration, there are competing resources at play; which I suppose highlights the issue that even though we do calculate a cost of capital, that it's probably not the, you know, it's not the key thing that drives our investment behaviour.

MS MAZZOLENI: Thank you. Paul can we pick up with you?

MR GOODEVE: At Powerco we generally use a Brennan-Lally version within the business, however our capital is provided by our international investors ultimately and I'm unsure as to what they use. I expect that they cross-check our number against their expectations

which would be, given they're Australian, I suspect would be an Officer variant. We do use a number of cross-checks and we're in a capital constrained environment, so whilst that's a hurdle rate, ultimately the projects we do are well above the WACC, at least we seek them to be well above the WACC.

MS MAZZOLENI: Thank you. Don from MDL on this side I think.

MR GRAY: Yes certainly. We use a Brennan-Lally model for calculating our pipeline tariffs, as I think we've advised earlier. We've not come up against recently, as agents for the mining companies, any particular investment requirements; but I have been involved many years ago in calculating many of the costs of - the hurdle rates for the gas pipelines that are now all over the country, and I can say that they were substantially higher than we were obtaining from the regulated WACC that we're using at the moment.

MS MAZZOLENI: Thank you. I think Greg from Unison.

MR MORGAN: Yes, we tend to use the Brennan-Lally model at Unison.

MS MAZZOLENI: If we can just move down the table with the companies.

MR CARVELL: We certainly use the Brennan-Lally model in the context of looking at our business from a regulatory perspective and as an input into our network pricing. However we get external advice on cost of capital for the various businesses and the overall business, and I'm not familiar with the specification of that model. And for hurdle rate decisions that might end up being something of an arbitrary number with the sort of additional margins or buffers that we referred to earlier in order to set that hurdle rate for investment decisions.

MS MAZZOLENI: Thank you.

MR FLETCHER: I think similar to Alan we use the simplified Brennan-Lally model but really purely as a cross-check against the regulated allowed rate of return for business reporting purposes.

MR COCHRANE: We use the Brennan-Lally model for the regulatory pricing perspective, we don't do any cross-checks, but when we look at other commercial activity as one of the participants noted earlier, we actually do add an additional margin for hurdle rate. Whilst there's no empirical evidence for that it really takes account of what the commercial activity is to determine the hurdle rate for the investment Determination.

MR BEST: The Trust has worked with Vector on a couple of very significant investment acquisitions, and for that it's been the case that it hasn't been wise or prudent to second-guess the Commission and try to come up with some alternative cost of capital

other than the Brennan-Lally model that is used by the Regulator.

MR ROBERTSON: We use the Brennan-Lally for our regulated side of the business. For the unregulated component, which includes for us property and other areas of the business, we use that as the basis but we then determine the hurdle rate above that which is flexed depending on the capital constraints in the business as a whole, risk perception with any particular investment, and how strongly the investment alliance with core corporate strategy.

MR BASHER: Wellington Airport also uses the Brennan-Lally for pricing regulatory activities, and similar experience to Auckland with the unregulated activities on considering hurdle rates.

MS MAZZOLENI: Thank you, did I miss anyone.

PROF BOWMAN: Can I make a point? I think there's a distinction in here that I don't know it makes any difference, but there's a difference in the sense that I would think that regulated companies would be remiss if they weren't using the Brennan-Lally model for estimating their revenue streams that come from their investments because they're subject to the regulatory process. Whether they then use the Brennan-Lally model or some alternative model for their decision-making on investments is a separable decision, so there's actually two things going on.

MS MAZZOLENI: Thank you, did I miss anyone from this side of the table?

MR FORD: Obviously we don't play in the regulated part of the sector from a pricing basis, but in terms of our sort of investment decisions, there would be a range of issues that we'd look at in terms of hurdle rates and those sort of things. It's an issue that we can come back to you on with a bit more detail around the sort of things that we do look into.

MS MAZZOLENI: Thank you for that. So it's half 11 now and we are just running a little bit behind, so just in terms of the industry-wide versus the firm-specific cost of capital; just by way of introduction under Part 4, as you're all aware all non-exempt suppliers of regulated electricity lines services and all suppliers of the regulated gas pipeline services will be subject to default price quality path and there is the potential for firm-specific factors to be included with any subsequent customised price quality path.

In the draft guidelines the Commission's preliminary view is that if all firms in the industry have very similar exposure to market risk the Commission proposes to apply the benchmark cost of capital to all firms in the industry. This approach would reduce the need to set individual allowed rates of return for separate businesses, the cost of which

can be especially high in industries with many regulated firms.

However, if there are real differences between companies within the same industry then the Commission will consider making adjustment to arrive at an individual cost of capital. It seems that the three key parameters that could be individually adjusted are the asset beta, the leverage ratio and the debt premium, leaving the market risk premium, the risk-free rate and TI and TC as industry-wide.

Now I do have three questions here but in the interests of time I'm going to compress them. So firstly, do parties generally agree with this, i.e. the parameters in the cost of capital model that I've just indicated could be firm-specific as opposed to industry-wide, so that's the first part of the question.

And then how would firm-specific parameters be estimated; i.e. would the firm-specific parameters be an adjustment to the industry-wide notional estimate, or would they be stand-alone actual firm-specific parameters?

And then the last part of this question, which I will roll together, is that given the reasons for not calculating firm-specific costs of capital are around the need to reduce the regulatory burden, particularly the costs of calculating individual parameters - firm-specific parameters and the time that that also takes, what suggestions are there for the way that process could be reduced, which is really a more pragmatic suggestion? What features could be streamlined, what information could be provided and how could that be done in a verifiable and streamlined way to ensure that we had timeliness and cost efficiency in calculating any firm-specific cost of capital?

So if I could go around the experts first and if you could just briefly address each of those three points and then we'd also like to hear the same from the companies. Brent, would you like to start?

DR LAYTON: The first point is I'll address my comments more specifically in relation to airports because that's an area where I think it's important to note that I don't think for the airport context in New Zealand it is appropriate to have an industry-wide set of parameters because each of them is not a perfect play or a pure play and each of them has a different mix, and even with inside their regulated activities they have a different mix between international and domestic and they are to some extent different businesses from a risk point of view. So that's the first point.

Second point in terms of something like lines companies, if you want me to talk about those, I think it's more possible as long as you can - to do it industry-wide. But

debt premium I think actually one should not look at the industry for working out debt premium but one should look at in fact across the whole of the debt market and the credit rate and the premium applied across the market for vanilla debt not just the particular industries. I would apply that comment to airports as well.

The third comment I'd make is that there's another parameter I think that could be individual industry. I note the Commission's intending to set it to zero but has some interest in it, and that's the debt beta which could be industry, which could be individual firm-specific, or could be industry-wide in addition to the others that you have put forward.

Simplification, I think it's quite difficult. I think you have to be careful that you are making sure that you're not simplifying to the point where you end up with the wrong answer or an answer that's inappropriate for a particular firm with inside the industry because of its particular characteristics that can be identified.

MS MAZZOLENI: Brent, could I just ask you in relation to your comment about airports, are you saying each of those parameters within the formula would be set on a firm-specific basis?

DR LAYTON: I'm saying debt premium should be set by reference across not industry but across the economy of what the debt premiums are relative to the credit rate, and I have some more detailed comments about how one should do that that I'll give you later.

In terms of beta and leverage and the debt beta, yes, I am saying it should be individual. In the case of airports each of them is a mix of property, retailing, mall ownership, office provision, and airfields. And in the case of a very large one, in fact the majority of its revenue comes from non-airport related activities. And then with inside the regulated activities there is domestic and international, there's cargo and so they actually have different mixes between the three airports of their activities which won't have common risk components. So I think in terms of airports it is important to treat each of them individually and separately for that reason.

MS MAZZOLENI: Thank you, Tony.

PROF VAN ZIJL: The three parameters, the debt premium, the leverage and the asset beta, perhaps shouldn't all be put into the same basket in the sense that the debt premium and leverage we can, at least at the individual firm level, observe fairly easily in terms of what leverage a firm is operating with, what debt premium it currently appears to be subject to. On the other hand the asset beta is a much more difficult thing to estimate because there

we're again trying to estimate something for which there is no real world reference.

For the first two, the premium and the leverage, it might perhaps be taken as an interval rather than as a point, in which case if it was assigned an interval then it might not make a difference whether particular values or - sorry, whether firm-specific values or whether industry values were used. And the same I guess applies to leverage in that if again a reasonably wideband was used then again it might not make a lot of difference.

Asset beta, clearly the reliability of an industry estimate is going to be greater than for individual firm estimates. For that reason you might want to go with at least as a starting point an industry estimate, but then if there is in fact significant variation across the industry members you might then wish to modify that industry estimate to something that at least intuitively you feel better describes the individual player.

MS MAZZOLENI: Thank you, Alistair.

DR MARSDEN: If I could just address mainly my comments in respect of airports. I agree that some sort of industry, first of all industry cost or estimate for these parameters is useful. But if I just look then at the specific parameters like beta, I acknowledge that different airports may have a different mix of passengers, domestic or international passengers, they may have different freight mix where that's a material part of their business, and they may have different risks to such things as asymmetric risks or asset optimisation or stranding. And to that extent they may mean that betas, there may be a small differential of betas between different airports.

In respect of the debt premium, likewise I think that they may differ across airports, obviously depending upon leverage, but remembering that I think that we should allow a fairly wide leverage range because leverage can be lumpy and change over time. But again, it's not inconceivable to me that different ownership differences, different size of companies and the different sort of forward-looking capex requirements may impact on perception of risk and therefore debt premium.

Just one comment really just on suggestions of the way the process moving forward, I think there is a difference here in that airports really just subject to an information disclosure regime and therefore you should have a fairly wide range of WACCs and that raises a question as to at least in the first instance the actual need to estimate a firm-specific cost of capital for them.

MS MAZZOLENI: Thank you, Troy.

MR NEWTON: Thank you Commissioner. We with Maui Developments Limited and the

pipeline are still a little unsure about where it sits either as a firm or what its industry is, and to that extent is the point-to-point service that Maui provides at all similar to most other gas pipeline networks in New Zealand, or to that matter around about the rest of the world.

The point-to-point part of the equation brings a different set of risks we think, asymmetric risks in particular. So there's still that matter which we're in two minds about in how you will deal and how we will approach that issue. But I guess for simplicity we're inclined to the view that to have a starting benchmark is helpful for everybody in respect of certainly asset beta. And then from there a process which allowed us to engage with you on particular matters to come to a landing on how those particular elements of risk might be recognised on asset beta.

In respect of debt and leverage, debt premium and leverage, I think a similar approach. MDL doesn't have a balance sheet of its own and so we're probably more open to a view which is benchmarked off other organisations.

MS MAZZOLENI: Thank you. John.

MR REDMAYNE: With respect to default price paths I guess I sympathise with the Commission, it's obviously practical just to have industry-wide estimates if you can, and I think that's probably the right starting point. But I think it would be helpful if companies have the ability to make submissions if their own circumstances are significantly different from the industry-wide assumptions and that they could be incorporated into their price path. Once you get into the customised price path then I guess that is a process where each company can make submissions on its individual parameters.

I would also say in terms of having industry-wide assumptions with respect to leverage and the debt premium, I guess that allowed, if you like, some potential for efficiency gains for firms to manage their debt and their balance sheet the way they want and it gives them a little bit of headroom if they can actually do better than the industry-wide assumptions, so I think that would probably be a useful outcome to have that in place.

And finally I just make the point that the discussions around industry-wide and firm-specific really relate to the input methodologies in Part 4 and of course with Telecom it's cost of capital has really been assessed on a service specific process, a service specific basis and it doesn't really, I guess, fall neatly within the discussion we're having here.

MS MAZZOLENI: Thank you.

MR GUTHRIE: I think the one concern is that the Commission should be trying to estimate the actual cost of capital and individual firms have different circumstances, and so in principle you'd want to have different parameters going into those models. But the other concern that we need to be aware of is the effect of these things on investment incentives, and I think that if you want firms to invest looking forward then you want your processes to be as transparent as possible.

And one danger with having a very firm-specific approach is that in four or five years time when some firms have made quite big efficiency gains and are making apparently large profits the Regulator's going to come under a lot of pressure to somehow claw those profits back and pass them on to consumers. And if you had a system of firm-specific cost of capital, that's an opportunity for you to succumb to that pressure, and as long as that opportunity is there that's got to discourage firms from investing in the first place.

So on balance I would suggest that an industry-wide approach is probably the better way to go unless the firm-specific changes are very transparent. And perhaps one aspect where that's the case is leverage. So I think having firm-specific leverage and a debt premium would be possible because you can't really fudge the leverage decision down the track. The asset beta, I'd be very nervous about having different asset betas for the different firms in the same industry if I was on the Commission staff because it would make it much harder for me to commit to allow firms to keep those efficiency gains.

So the asset beta, unless there was really strong evidence of big differences across firms, I'd tend to use an industry-wide figure, but the leverage and the debt premium, maybe they're up for grabs.

MS MAZZOLENI: Thank you.

MR BALCHIN: I'll discuss the leverage ratio and debt premium first because I think conceptually they're easier. I think the important context for this is that you're talking about setting a WACC, or estimating a WACC for regulatory purposes rather than just valuing the company, and I think that imposes some additional disciplines.

In my view the sort of only sensible thing to do is to adopt a benchmark leverage and debt premium for the industry that's based on observed practise of sufficiently comparable entities for that industry, and there are a number of reasons for that. One of it is, the most important reason is it means that firms financing decisions of their own

business, if they make poor financing decisions they bear the cost, if they make good ones they retain the benefits. But associated with that it means that it avoids the risk that if you say that how firms actually finance matters, it avoids creating an incentive for firms to do what in Australia we called some time ago world class financial engineering to manipulate the outcomes.

Gearing also can be quite hard to measure anyway, firm's actual gearing, particularly if they're part of a larger firm. Attributing gearing to divisions is quite difficult. And in Australia we've had a number of entities where the listed entity has debt, it owns an entity that itself has debt, and I know of one case where there's actually been a third entity that itself has debt.

So the actual level of leverage for the asset at the end of all of that is actually - it's actually three levels of debt that cascades. So actually getting to the bottom of that is quite a complex task, particularly if it's only the highest level entity that's actually listed or all out in the public, and if the lower levels are actually unlisted.

So my advice for the - and the third reason is it actually makes your job a bit easier in explaining your decisions. If you say that we think these firms have the same amount of risk, it makes sense to say we therefore give them the same WACC. To do otherwise because they've done things in the past or for whatever happens it makes it harder to explain to the population, general population or all the audiences as to why that's being done.

Turning to betas, I think that's a bit more complex. In theory every firm has a different beta because they are all different. In practise, however, deriving a reliable or an asset beta which we can be confident in for an industry is a very challenging task. I've been trying to do this for over a decade in Australia for energy firms. And to be perfectly honest I think I would have got more sense out of staring at tea leaves at times than actually examining the empirical evidence. This is a very hard task, even for groups of firms the imprecision is very high.

So it's a bit difficult to then - and to go the next step further and say different industries, different firms within that sector are sufficiently different that it should have a different beta is actually - it's getting well beyond the decision that empirical evidence at least can justify. So I think before you do that you want to be - you want to make the first decision that these firms are quite different, or sufficiently different that we think we'll exercise that judgment - because it will only be judgment, it won't be empirically based -

that those betas should be different.

In Australia for the energy sector -

MS MAZZOLENI: Excuse me, Jeff, could I just ask you to wrap your point up, I'm just conscious of the time and we have to get around this.

MR BALCHIN: Okay, I'll make my point very quickly then. In Australia for energy typically we don't distinguish between the sectors. In my view particularly the urban rural issue for lines businesses, even though my colleague is Powerco, I'll let you know I've been an expert witness arguing that all the risk difference is basically diversifiable risk anyway. So I think there's actually a solid basis for providing the same beta for those.

I have some sympathy, though, for Brent's view that the airports may be sufficiently different to adopt different betas. In Australia when the ACCC had a role in setting prices for airports they did actually look at the differences in traffic, or passenger types in traffic for the airports and adopt different betas. That, however, was based on judgment, so you'd need to understand that it's hard to get an empirical fix on that.

MS MAZZOLENI: Thank you.

MR IRELAND: Just addressing the usefulness of industry-wide asset betas, I just draw to the attention of the Commission that when I reviewed the determination of asset beta by the Commission since year 2000 what I'm impressed about is the body of knowledge that's being built up through consultation process, which is individualised beta for industries or for particular companies that's had reference to the contracts that have been set in the commercial world and how risk is allocated, and also the regulatory bargain. And if you look at Transpower as an example, the risk has been split up between the parties, it's been split up in certain ways. And it seems to me that you should not lose track of that body of knowledge because when you bring it together it has some appeal and it has some foundation in this market.

The only two areas that were contested I would say were something like the TSO at 0.02 and maybe too low in some people's opinion for the risks that were borne and alternatively Transpower slightly too high. Now other than that I would say there's a reasonable reflection of the underlying contractual arrangements, and it would be very hard to generalise that because what you'll do is if you set a rate the first thing I would do if I'm asked what do I do about that? I would say shed the risk. The rate fixed, I'll now shed the risk and hopefully I will enhance my risk adjusted return. So somewhere in there there's an answer, but don't leave the history behind.

MS MAZZOLENI: Thank you.

MR SHELLEY: My comments will be in the context of setting an input methodology for electricity lines businesses. I agree with the comments that have been made on asset beta is really just too imprecise, too difficult to establish that on anything other than an industry-wide basis.

When it comes to leverage and debt premium, I think both of those are potentially issues that can be considered on a company-specific basis, even within the context of 29 electricity lines businesses. And I think a very important point to bear in mind is that all those electricity lines businesses are not the same, there's huge differences in scale, and those differences in scale affect proportions of the debt markets that they can access. Some of those EDBs can only access bank debt, some of them can access other forms of debt, might be say private placements of bonds and it might only be the very largest, such as Vector, that can access what we think of in terms of the bond markets.

My own view is that it would be impossible for the Commission to actually talk to both a range of EDBs and independent risk assessors financing firms such as Asia Pacific Risk Management and come up with where the levels are that a firm could access different types of debt, and also get the independent verification of what the cost of those different types of debt would be. So it would be possible to segment up firms and say right you fit into that band, you're only going to be able to access bank debt, you fit into this band you can access a bit more, and you're the very largest couple of firms, you can access further debt there. And it would still be a fairly mechanical process, it could still be one where you could obtain independent parameters and hopefully be relatively quick, but it could still be robust and relatively firm-specific.

MS MAZZOLENI: Thank you.

PROF BOWMAN: With respect to the asset beta, with all the problems of estimating asset betas and problems of so many cases not being pure plays from where you can observe them, I think industry average makes sense. I think the Commission should be open to arguments that be set aside but those arguments should be pretty compelling before you do. The airports, as Brent mentioned, is probably an area where that would apply.

On the debt side, first I think it's important to keep in mind that the debt risk premium and the leverage are linked to each other, you can't sensibly separate those two. So you need to consider them together.

In spite of having some public companies that can be observed there's a real

problem with the pure play problem that companies, and Brent mentioned it with respect to airports, that they're in different businesses that may have - so if you observe the gearing, the leverage of Auckland Airport you're seeing the gearing of a lot of different activities, and then when you come to the regulated part it doesn't follow that that's going to be the same.

So I don't think we can rely too much on observable data, even though it's there and it's tempting, I think you have to be very careful about doing that with at least many of the companies.

I'm inclined, with respect to the debt risk premium and leverage, particularly with leverage, leverage is determined by the firm. Now in a market context but the firm makes a choice and can control that, and presumably it has incentives for why it does that. So I'm inclined towards firm-specific with respect to leverage.

I think it's a bit, I'm tempted to say arrogant so I probably shouldn't but I have, of us to say that any of these regulated companies don't - that we know better, we as being an expert to the Commission, we know better about what its capital structure should be than those firms that are bearing all the consequences of those decisions. So I find firm-specific decisions on leverage to be quite compelling, the difficulty is what are they when you have multi-divisional firms. So that's an issue that has to be dealt with.

And then with the debt risk premium I very much agree with Andrew, the problem is if you set an industry, again it's nice as a starting point or as a benchmark, but you have firms in such different segments of the market that what one firm can achieve in the market and what its debt risk premium might be can be substantially different from a firm in the same business but of a different size in particular with access to different markets and what they might achieve.

So I think these are not - it's not as simple as being able to observe something in the market and say that's what it is, I'm afraid there's quite a bit of thought needed, but on the debt and leverage side I'm inclined to the firm-specific.

MS MAZZOLENI: Thank you.

MR HOOGLAND: In regard to a company such as Transpower, which is obviously the only firm within an industry, there's probably not a lot of difference between the firm-specific parameters and industry-wide version. In regard to Transpower it has an individual price path and sort of specific incentives and risks, so it seems reasonable to use the - it also has an appropriate capital structure, so it certainly seems reasonable to use the firm-specific

parameters in regard to leverage and beta.

In regard to the debt premium, I think that's - I agree with some of the earlier comments that that's really related to the credit rating of the individual firms and therefore can be done on a sort of a debt market basis rather than what attracts to an individual firm.

MS MAZZOLENI: Thank you.

MR ROBERTSON: I'd like to make a comment seeing Auckland Airport was mentioned. We confirm airports do have very specific factors to them. But one of the challenges for determining firm-specific factors in terms of leverage and debt premium is the regulated and unregulated business components, and the question might be to ask if the regulated business was stand-alone would you actually have the same leverage ratios that you would see in the firm-specific? I'd suggest you wouldn't; and therefore would you see the same debt premiums that are specific to the firm, and again linked to leverage you wouldn't.

MS MAZZOLENI: Thank you. Martin or Russell did you have a comment on this?

DR LALLY: On the subject of asset betas there are certainly theoretical reasons why there might be variations at the firm-specific level, even if we're looking at a group of firms that are in the same so-called industry and subject to the same so-called regulatory regime.

But as most of the commentators here have observed, the difficulties in estimating asset betas at the industry level are severe enough. To attempt to differentiate at the firm level is I think going beyond what the data will allow you to do. So I would favour an industry asset beta, even recognising that there might and probably are variations at the firm-specific level.

On the subject of the debt premium and leverage, as Jerry and others have observed, this is a package, you have to look at the two of them together. Superficially it appears that these things are observable, but as many people have commented you can only observe these things at most for a firm, and the regulated part of it may be a small part of it.

In addition, whilst you can observe leverage, you can only do so at a point in time and fluctuations across time can be quite substantial. If a firm's equity value suddenly drops then of course its leverage is immediately affected. And what you should be interested in as Regulators is not leverage today at 9 am, but leverage over the regulatory period. And given that it can fluctuate quite substantially over time that should push you away from looking at the leverage for an individual firm on an individual day.

In respect of debt premiums, again superficially it looks as if you can observe them with a high degree of provision. But you can only do so in respect of the small proportion of bonds which are being traded in the secondary market. And even if you have got a firm that does have some bonds of that type, typically they are a minority of the total debt of that firm. So even if you're able to say very precisely what the debt premium is on the ABC bonds of firm XYZ you would have difficulties in extrapolating from there to the whole firm.

So in view of all those points I would favour leverage and debt premium also being set on an industry-wide basis.

MR INGHAM: Really just I think, you know, the points have been made about the data difficulties if you try to go down to the firm part, particularly related to, for example, with leverage you've got the issue of there are a lot of firms that are unlisted so they don't actually have a market value of equity in terms of calculating that, you've only got a book value of equity. Martin has alluded to the issues of the fact that we actually need to be forward-looking rather than looking at the historical actual, so in terms of some sort of target leverage.

In relation to the debt premium I think the point has been well made about the issues of the fact that what we're observing in terms of the debt premium in terms of that publicly available information is actually only a very small component of the debt that is out there. There has been debt issued in many different markets in many different channels, all with different pricing and it's been done based on what was best at the time for issuing that sort of debt.

So I think you've got a practical problem. Yes you could get the data from the individual company but then as has already been alluded to is the fact is we don't have any pure play companies sitting underneath that. So in fact actually attributing a debt premium and a leverage to the regulated assets becomes, I believe, very difficult.

MS MAZZOLENI: Thank you. Given that I've been a fairly abysmal failure in making up any time and we are over, I know I said I'd give companies a chance to speak on this, but we have got individual sessions on each of the areas that have been addressed by the experts tomorrow, and so I think we'll get company comments on that in each of those individual sessions. Particularly I'd ask companies to have a think about how some of those information requirements could be streamlined and the information verified where we are looking at firm-specific just to reduce the timeframe and the cost, if we were to go down

the firm-specific. Thank you.

EXPECTATION OF NORMAL RETURNS

MS BEGG: We're going to move then on to another - we'll start with a framework issue, which is the Commission's expectation of normal return framework, and I'm going to seek your views on that, and then we'll move into some more specific issues of asymmetric risk and actually the hurdle rate issue which people have mentioned as well.

Just then summarising what the Commission's overall approach to the expectation of normal return is, which has been summarised as NPV equals zero but perhaps that doesn't give sufficient richness to the framework. The Commission notes that an efficient firm in a workably competitive market would expect to earn normal returns over time, that is it would expect to earn its cost of capital on investments, but the Commission also recognises that the opportunity to earn a positive economic return provides incentives for efficiency and to actively seek out opportunities for innovation and so on, and the Commission seeks to replicate those arrangements or incentives in the regulatory regime.

And so the basis is that over time a firm should have an expectation of earning normal returns, but there should be an opportunity, ex-ante, for them to out-perform that standard and earn positive returns. Of course returns will fluctuate over time, so you'll see that people will earn above or below the expected rate of return. But the opportunity to earn above return is available there, but obviously the arrangements also seek to set a constraint to rule out expected profitability exceeding the cost of capital over a prolonged period.

And I just wanted to start by asking whether people have concerns about that expression of the framework. I'm thinking of Unison particularly here and I'll start with them because they did express some concerns with overall framework, and then I think there are specific ways, issues that we might get into which are not so much with the framework but with how it is applied, which maybe is where the concerns rise. I'm going to ask Unison, and AECT in the past have expressed concerns about financial capital maintenance which is akin to this, related, and then open it to others to comment, just on the overall framework and then we'll dig down into some of the more detailed issues.

MR SHELLEY: I think our concern was just a different interpretation of what's meant by a workably competitive market. We can consider it as a hypothetical thing where you earn

a positive return for a period of time and then competition generally pushes returns down to zero. But I think we were looking at it from even more of a practical real world market than that, in that if you were expecting to earn a zero economic return on an investment you just wouldn't make it. You've got other places to put your capital where you can have an expectation of a positive return. Capital is never available on such quantities that you can afford to just put it into an investment where you expect to earn a zero return.

MS BEGG: So are you saying that our cost of capital is obviously obtained from market evidence, and that reflects what firms have earned and their cost of capital's derived from that, are you suggesting that there's something missing from that estimate or are you saying there are other factors that in our measure of cost of capital aren't being taken into account?

MR SHELLEY: I think it's partly the other factors that are taking into account but it's also whether you're looking at it from the point of the return that the investors are expecting to get or the return that the firm has to target in order to deliver the expected return for investors. I think there's a subtle difference there too.

MS BEGG: So should we be setting the return that investors expect to return, which I would have thought is what we're doing and you are setting the hurdle rates etc to achieve that or -

MR SHELLEY: That's right, I think what we're - the difference is we're saying - I suppose one way of illustrating that is when you get to the question of should the promised yield on debt be used or the expected yield on debt. The expected yield on debt is what the providers of debt expect to return, expect to receive, which is the promised yield less some probability of default. And if you go down that path the riskier a firm becomes the lower the return you allow it for debt.

But if that's all the firm was ever allowed to earn in terms of its cost of capital then the probability of default would continue to increase. So instead you have to allow the firm the ability to earn more than what the investors expect, because there will be upsides and there will be downsides, and once you take into account those downside events, which are rare but do occur, then your investors earn their expected return.

MS BEGG: I'll get others to comment, but it seems to me that you're making some assumptions there about what the market returns being measured are. But perhaps we'll get AECT who also didn't like the framework and then we'll go around to other commentators.

MR BEST: Thank you Commissioner. The AECT has in the past made some strong

representations in terms of FCM and essentially its dislike of that being the regulatory standard. I guess that position is well-known to the Commission and so I don't think this is the time to relitigate that. But obviously there is a link between rates of return, cost of capital and the FCM standard or the NPV equals zero principle.

Having said that perhaps the way I should talk about this is that following the Input Methodologies Conference, AECT, I guess, tried to join in with the spirit of that Conference where it was apparent that the Commission was trying to settle a regulatory compact, at least in relation to the electricity line businesses; and so the Trust went away and in the spirit of that tried to come back with a position that would allow it to join that regulatory compact and join up with the FCM.

And just to take a step back, I mean essentially the Trust sees FCM as a hedge over asset values where in the normal competitive sector under workable competition unless you're specifically trading in those particular assets most businesses see changes or revaluations in assets as either being windfall gains or losses, whereas under FCM the gain or loss in asset values is taken into account through prices. So effectively there is a hedge on the value of assets.

So coming back now to the rate of return and the position that the Trust tried to take in relation to the regulatory compact, the Trust saw that, or the Trust believes FCM isn't a fair hedge in the sense that there's always a risk that if assets were to decline in value substantially the Commission may reverse its position in relation to FCM and simply say let's do what happens out there in the competitive market, and if you made a loss on the value - in an investment on those values changing then that's your risk, poor decision in terms of investments.

So the Trust took the view that the difference between FCM and no FCM was essentially a regulatory risk and maybe one or two other risks along those lines, and risks, whether or not they are systematic or non-systematic, can be addressed either through cashflows or through the rate of return.

So our view was the NPV equals zero principle can be achieved by a premium to the cost of capital that is determined under normal corporate financial models.

MS BEGG: One of your concerns, I think, has been who bears the risk of unexpected asset revaluations and the regulatory regimes tended to pass them to consumers; and you're saying that - I mean that's the choice that you can make and I guess it's reflected in the return, but you're also signalling that might change so there's an asymmetric regulatory

risk associated with that choice?

MR BEST: That's correct.

MS BEGG: As I understand what you're saying, okay. I'll move around our left-hand side of the table to Professor Bowman.

PROF BOWMAN: Particularly given the time I'd just make the point that certainly in theory I suppose you'd say, or academia or textbooks, it's clear, and I think unequivocal, that firms should not make investments unless they create value for the firm, and creating value means NPV greater than zero not equal to zero. And then as has been said and probably will be said more, firms as a practical matter just don't make investments conventionally unless there's a positive NPV that's considered appropriate or adequate for them.

MS BEGG: Garth?

MR IRELAND: I just amplify a point made previously that I believe the issue of normal return is a little bit wider than mentioned. The fact is based on market evidence that if you invest well today at the WACC set by or determined by the Commission, tomorrow the market will give you $1.50 to $2 and that's the game, you invest a dollar, incentive for investing is huge because you can double your value notwithstanding there are all sorts of other add-ins, but certainly a normal return is additional to that particular capital gain, so that's a little bit of sanity to the conversation.

MR GOODEVE: I'd just like to - we've heard a couple of times this comment about the ODV multiples and quite frankly like a number of multiples associated with transactions they are as good or as bad as the assumptions behind them. The ODV multiples that are often referred to are ODVs related to 2004, they reflect regulatory values that have no reflection whatsoever to the actual costs of doing the business.

So while Garth says look you get $1 of ODV you get $1.50 back, in many instances assets that are in the ODV Handbook are valued in there at 25 cents of what it cost you. A power pole might be in there at $1,200 but to replace it is going to cost you 5 or $8,000. So those sort of multiples are just meaningless. The only reason I comment about that is I don't want that to colour what I think is a pretty useful discussion here today.

MS BEGG: Okay, thanks, and I do think there's a diversion from where we are, which is just trying to get acceptance that in the market the rate of return observed is a reflection of the cost of capital and firms should generally have an expectation just of earning their cost of capital by definition. But I'm hearing that people are saying that they should earn more

than that, which is not what we see in the market. And I can see the distinction between what firms themselves might set hurdle rates etc which are above that, that's obvious, and I've observed that myself but -

MR GOODEVE: If I can just make the comment this is in many ways not really a WACC question, it is an input methodology question. If we assume that the WACC fairly reflects the expectations of what you return then so long as you make $1 more than that you're probably relatively happy, assuming that that WACC is fairly calculated.

The issue for us as operators is actually how much of the upside are we going to get to keep on good investments and what happens with the downside on poor investments. And that is a question of the input methodology, the PO adjustment that occurs in the default price path, whether it becomes a revenue regulation or a price regulation. So those are the sort of issues that we need to take into account.

And if the default price path PO adjustment comes along and says look last year you made a bit more than WACC, we're going to take that off you going forward, and then in the next period it comes back and says look you earned a little bit less than WACC, we're not going to give that back to you, so what happens is you end up being capped at this WACC. You can't make enough during the good times to cover for the inevitable poor times.

MS BEGG: So the NPV's less than zero in that scenario.

MR GOODEVE: That is the potential with the input methodologies. I guess the view that we had in our submissions is that it's a consistency thing across the input methodologies and the WACC and making sure they all relate together. So we are aiming for NPV equals zero, assuming that WACC's calculated properly, but we need to make sure that the input methodologies don't act as a cap to give us the buffer for the inevitable disappointing investments.

MS BEGG: Okay, Jeff.

MR BALCHIN: Paul's actually stolen a fair bit of my thunder so I'll be short, for a change I might say. I've been critical of NPV equals zero a couple of times in the past in the context of asset valuation commenting that it's hard to apply that retrospectively to value assets. Now we had three very useful days a couple of months ago to talk about that so I won't bring that up again.

In the context of airports there will be a challenge trying to again apply an NPV equals zero type framework to an annual or short terms of returns and infer sensible

results from that and I think that's also than issue we'll come back to in other forums.

In terms of how that then applies to the discussion for this Conference, what we've advocated is using a well accepted method to estimate the cost of capital combining evidence from finance theory, evidence based from finance theory as well as market practise. But also recognising that WACC can only take you so far so we've got to properly account for stranded asset risks and those sort of risks, nasties that might occur that aren't in your normal forecast of opex and capex.

And I'd also like to emphasise the point that Paul made, as a matter of good regulatory design there may be a an expectation of normal returns, but it certainly should be the opportunity to make a superior return if you're a superior performer, that's just a matter of good regulatory design; but again that's a matter for other forums.

MS BEGG: And that's explicitly part of the Commission's framework is that opportunity, which we'd like to emphasise, because sometimes I think that is forgotten that we are on an ex-ante basis setting these allowances or the price path but allowing people to out-perform if they can, and keep the profits, at least for a period. Graeme?

MR GUTHRIE: In terms of the discussion so far I think a lot of the disagreement comes, or confusion comes about because of the way in which the NPV is calculated. I have no problem with NPV being zero being the threshold provided that you calculate the costs properly. And the cost - basically the present value of the revenue needs to be at least as great as the present value of the costs then firms invest.

That's fine as long as the costs are calculated correctly, and that means that when you undertake these investments it's not just the capital expenditure that counts it's also the options that are destroyed when you invest. And that always leads us into a long convoluted discussion because we're talking about pipelines and telephone networks and so on.

I'd bring it back to looking at a property development. If I wanted to build a hotel somewhere up this part of town, in order to do it I need to have a piece of land. Now when I'm making the investment decision I look at the value of the hotel when it's finished, I look at the cost of building it and I look at the cost of buying the land. I don't think anybody would suggest that I should do anything else. Now the land itself, its only value comes from the option that it provides to put a hotel on it. So we include it in the cost base when we're doing the NPV calculation.

It's exactly the same if you're extending a gas pipeline, you've got a pipeline that

goes to a certain group of houses, that gives you the option to extend it into another region. When you decide whether or not to expand that pipeline you're looking at the revenue that it generates, you're looking at the cash that you're going to have to provide to extend the pipeline, and you're also looking at the fact that you're using up this option to expand in the future.

In exactly the same way as my empty piece of land in the middle of Wellington, when I put a hotel on it I'm using the option up to put a different building on it at some point in the future. I include the land value in the NPV calculation when I'm building the hotel and I should include the option value when I'm making the investment decision about building the gas pipeline.

So NPV equals zero I think is fine provided you include all of these costs in the calculation. And I think when people from the firms are saying we'd need to have an NPV that's positive it's because implicit in that - you've got to make it positive because they're perhaps not including the option values in their cost base.

For the same reason when we look at the rates of return, it very much depends on what you're applying the rate of return to. If I'm investing - if I buy a piece of vacant land and I put a hotel on it, if I measure the rate of return on the initial investment, that is the value of the land and the capital expenditure, then I'd expect to get the WACC. If I can do better than the WACC then I'd invest. But if I only calculated that rate of return on the capital expenditure I'd have to do an awful lot better than the WACC because I'm not including the cost of the option in the original calculation.

So if the Commission when it does these calculations includes all of the relevant costs, i.e. the options in the rate base, then I think your best estimate of the weighted average cost of capital is a suitable rate of return. But if you're not going to include the options amongst the costs, then there's no way that a firm is going to be able to break even unless you add some sort of premium on to the rate of return.

So there has to be compensation somewhere in order for this NPV equals zero to be true and it's either via a rate of return that's in excess of the weighted average cost of capital or it's by making the rate base bigger than just the replacement cost.

Just one point before I hang up, this comment about investing $1 and get $1.50 back; even if those numbers were correct, all that tells you is that there's a 50 cent option floating around and it hasn't actually cost you $1 to get that $1.50, it's cost you $1 in cash and it's cost you 50 cents in this option that you've used up. It's not inconsistent with

equilibrium in a market.

MS BEGG: We're going to have some further discussion on real options perhaps I'll defer that, but thanks for that and we're just more focusing on the framework issues and what we need therefore to discuss further in this session I think is what we're identifying here.

MR REDMAYNE: I guess I see something of an inconsistency in the Commission's statement that firms are allowed to share efficiency gains but at the same time over the long-run they will only earn normal rates of return. Now I guess maybe that proposition is on average across all companies, but I would have thought that if an individual company can do better than average in innovation and getting efficiencies etc, that that firm would have an expectation that it could actually earn more than a normal rate of return over time. That's one point.

The second point is really just, I think Graeme's covered it much better than I can, but I think this NPV equals zero framework has to count for asymmetric risk and destruction of real options. I think once you do that I think those things I guess explain differences, or help explain differences between the WACC and hurdle rates.

MR GRAY: I guess, I mean my experience is basically in the pipeline business, and there's a number of things that we can say. First of all that the people who are putting up money for investment, in our business at least, are generally very large multi-national companies who have a lot of investment opportunities elsewhere. That means there's particular hurdle rates put on to any money that comes into New Zealand, and I don't think it would be any secret that they're probably substantially higher than the sorts of regulated returns we're talking about here, so we start there. When it comes to an investment proposal I would not expect any investment proposal that had an NPV of zero to get anywhere in New Zealand. That's against that hurdle rate of return. It's as simple as that. Thank you.

DR MARSDEN: I would agree with Graeme, particularly in his comments on this NPV equals zero, provided that you correctly include as one option in the asset base the value of real options. I guess this is also sort of a financial economist's concept and firms will clearly try to identify and undertake projects that are greater than net present value of zero.

If I can just make a couple of comments which I think are relevant to airports, again under the sort of information disclosure regime. When I think about an NPV of zero of course what I'm thinking about is to say over the life of the asset and that may be different to a price reset period. And again in relation to airports and consultation with airlines they may implement, for instance, some sort of price target or depreciation

profile, it may be under-recovered in a particular period with a view to over-recovering in a subsequent period; such that under an information disclosure regime I think you need to be very careful in terms of the way that you might apply this, what is an ex-ante concept, in terms of monitoring returns. Again because clearly ex-post returns can be substantially different from ex-ante both in terms of cashflows, there's problems in the case of airports clearly forecasting passengers throughput. And again you could have a wide range of possible cost of capitals where again an NPV equals zero is really based on a point estimate calculation.

So I'll just close there by saying that I think in respect of an information disclosure regime it would also be helpful to get kind of more clarity as to how the Commission might apply this concept.

PROF VAN ZIJL: When we talk about NPV equals zero here we are of course talking about NPV equals zero ex-ante and that really is just another way of saying you should set prices on the basis of the building block model because NPV equals zero ex-ante just means that you're going to earn the set cost of capital. So that seems unexceptional, providing that all costs have been properly accounted for, so that in particular in terms of, say, the weighted average cost of capital that that has been set so as to reflect allowance for parameter error and model error.

The difficulty arose as I think is in the ex-post monitoring in that the ex-post monitoring of course is very difficult in the sense of comparing an actual outcome from one trial with an expectation for that trial, and if one could extract from that comparison all the sort of random factors that might be at play and then found that the realised result was well in excess of the set or expected result, one then also has to allow for the possibility that the firm has done something rather clever, it's been able to deliberately earn better than weighted average cost of capital because of some innovation.

And I think our regulatory regime should be such that there is an appropriate incentive for firms to innovate and invest, and so if a firm sees some way of achieving better than expected results and there should be no penalty for that at the monitoring phase of an ex-post comparison achieved with expected. So providing that firms can, at least for the duration of the regulatory period, hold on without any suggestion of penalty to gains made above expectation as a result of clever management of their resources, NPV equals zero ex-ante is perfectly unexceptional.

MR SHEPHERD: I think it's important to anchor this discussion back into the Purpose

Statement, which probably sounds a little bit like an echo from the Conference a few weeks ago, but nevertheless part of the Purpose Statement states "promoting outcomes that are consistent with outcomes produced in competitive markets". And so one lesson I think we can draw from that, or one question we could pose, is do workably competitive markets adjust prices immediately to reflect a notion of WACC that is a full WACC at all points in time, and I think the answer to that must be no. Then an alternative question would be do workably competitive markets and prices within them trend over time toward that specification, and the answer's probably yes.

And so it would seem to me that the Commission needs to take those issues into account when thinking about applying this sort of relatively abstract rule of NPV equals zero.

In your introduction, Commissioner Begg, it seemed to me that you applied very important qualifications to the idea of NPV equals zero where you mentioned that businesses would be able to retain returns above that in some instances, and I think those qualifications are actually the very important part of the specification. Because without them it's difficult to see how limbs A and B out of the Purpose Statement would be fulfilled.

MS BEGG: Yeah, I agree, I think the shorthand NPV equals zero has sort of overlooked some of the detail of the Commission's framework which does - I mean it is incentive regulation, that's what we're trying to implement, and that does mean we need to give people incentives to out-perform and to achieve that they obviously have to retain some of the benefits. So we're certainly not looking to strip out benefits straight away so that NPV equals zero is met at every point. So yeah, I hope that is clear to people.

DR LAYTON: In terms of the WACC and NPV equals zero I think they're very useful and I recognise the sophistication with which the Commission has used them in setting price paths and so forth. If we're going to have a further discussion on asymmetric risk and real options I'm happy to leave my comments until then, if we're not I have a number of things to say.

MS BEGG: We're going to move to that fairly shortly actually but we'll just finish the general; if Martin or Russell -

DR LAYTON: I'm happy to end there given the time.

DR LALLY: I'd like to make three comments on this subject. The first is just to reiterate the point that I don't see any necessary inconsistency between an NPV equals zero rule and an

incentive regime which allows firms to keep efficiency gains for a defined period.

The second point is that regulation is designed in some sense to substitute for competition. You wouldn't have regulation if there was perfect competition, so regulation is a substitute for perfect competition. And if it does as good a job as a perfectly competitive market then surely there wouldn't be anything to complain about. We would not expect industry representatives appearing in front of Regulators complaining about the pernicious effects of perfect competition. So if regulation replicates perfect competition then it must be unobjectionable.

But at the same time there is this attractive notion that no firm would engage in an investment unless it was NPV positive. And that seems to sit very uncomfortably next to a Regulator who is working in accordance with an NPV equals zero rule. And I think the two can be reconciled. When a firm enters a new line of business presumably it doesn't do so unless it sees NPV as being positive, and NPV being zero would not be sufficient.

But firms are realists, they understand that NPV positive does not last forever. At some point the force of competition will drive NPV to zero. What do firms do at that point? Well, the historical experience is that they do not vacate the market, they continue to replace the assets, even though they are now in an NPV equals zero world. They've enjoyed the benefits of NPV positive for a while but now competition's arrived and pulled them down to NPV equals zero.

Now firms understand that, they understand they're going to get NPV positive for a while but competition will pull it down to zero eventually and that's it. Well, if a Regulator is substituting for competition then it can't be doing anything to firms that isn't being done by perfect competition. So it must be unobjectionable in that sense.

The third point I'd make is that discussions about NPV equals zero are kind of premised on it all being measured perfectly accurately, right down to the fifth decimal point. But we know that's not the case, we know that there are estimation errors when it comes to WACC and there are model errors as well. And Regulators, in my view, should be moving into the upper tail of the WACC distribution to protect against the possibility that WACC is set too low.

And if they're doing that, for example, we've got our beautiful WACC distribution here, the 50th percentile is a WACC of 10% and the 80th percentile is a WACC of 11%, and the Regulator chooses the figure of 11%, mindful of the possibility of estimation error and maybe also model error. What does that mean that if the Regulator chooses the 80th

percentile? It means that the probability that the firm is earning WACC that's positive is 80%, and a 20% probability that they will do worse.

So once you move out of a world in which WACC is measured with perfect accuracy and therefore NPV is perfectly accurately measured and you take account of the possibility of estimation error, there is something here that firms are benefiting from.

MS BEGG: Okay, I'll just finish, just check with the airports and Vector because I didn't give you a chance at the start, whether you want to comment and then it is lunch time, so following those comments we'll break for lunch.

MR ROBERTSON: A brief comment from me with regards to information disclosure looking ex-post. I was reminded at the break of a deal we did with the airlines on an expansion of part of our terminal where we agreed to only charge them 50% of it for the first period and then have an NPV equals zero for another bit and then earn greater returns in the outer years as a way of - under consultation agreeing prices. I mentioned at the break that we probably wouldn't do that again in this sort of setting because it runs the risk in the outer years of actually earning greater and being accused then of over-earning not taking into account that for the first four years of a 12 year investment you under-earned on that particular investment. So I think we've got to be mindful in an information disclosure regime to look over a period of time, not look at one particular year.

MS BEGG: Vector or - has everybody - **[no comments].** Just before we finish up I just wanted to check whether there's anyone else had any comments perhaps on Martin's comments or the comments other parties have made, is there anyone who'd like an opportunity just before we -

MR GUTHRIE: The point that was made was that an NPV equals zero world is what you'd get under competition, and if we'd had this discussion in 1994 the theory such as it was would have backed that up. But in the last 15 years people have looked at that work and I think now you can't back that up. There's some sophisticated modelling that looks at equilibrium behaviour of markets, theoretical work, and it shows that in an equilibrium in which everybody is a price taker you still get situations where real option values are positive, where the NPV, as I suspect most people around the table are thinking of it, has to be strictly positive by quite a substantial margin before firms invest, and that's all taking place in a theoretically competitive market.

So, I don't think we should go to lunch thinking that competition eliminates real option values. If anybody's interested I can provide the papers for them to read it, but

there's theoretical evidence, there's empirical evidence, and it's not 1994 when that paper was published. We know now that you can have positive real option values in competitive markets. That's all.

MR FORD: Just one point I'd like to make of sort of the context of the airports, we've been talking about an NPV equals zero type approach. From a general framework point of view I guess one of the issues we have around that is that if you're looking simply at the aeronautical part of the business you're not actually going to get a true picture of what the NPV result over making an investment is going to be because that investment is going to have been compensated for through the aeronautical revenues, plus the business is getting compensation through other revenues as well. So there's a wider picture, certainly in the airports context, because of the complementary nature of the businesses that's going on, just to sort of understand that overall picture.

And just picking up a couple of points that Alistair was making around looking at the airports in the context of information disclosure only; I guess to some extent you need to sort of - to my mind you need to be focusing back on what is the purpose you're trying to achieve by information disclosure, and that is to ensure that people have enough information to assess whether the purpose of Part 4 is being met. And I think in a lot of the discussion around here I haven't really heard much about the long-term interests of consumers, I think that's one issue where we need to be focusing back on; so that's all.

MS COOPER: I'd just like to note that NPV equals zero shouldn't be handed to firms on a plate, there shouldn't be an expectation of it. Really I would suggest there should have to be above average management of the firm in order for the firm to be able to earn that level. Superior performance can equate to a positive return, but likewise inferior performance, in the real world that represents less than NPV. And I just think that if all the inputs are favourable to the suppliers then you end up with, yeah, with NPV being just provided to the firms as of right when it shouldn't be, there should have to be superior management to earn that level.

MS BEGG: I'll just check with fellow Commissioners.

MR DUIGNAN: Just very briefly if I pose a question perhaps it could be answered after lunch by Graeme. That was that if we think of what we're trying to do is get a WACC estimate that is the historical mean internal rate of return of the entire market, if that was what we were doing, then for the market NPV equals zero would automatically follow, it appears to me; and so at some point perhaps when we come to the real options I'm puzzled by the

proposition that the real options are sort of outside the record of what returns have been earned in the global, or the overall equity market.

So if you could just regard that as a question for when we get to the real options discussion, because we certainly think of the Commission as trying to identify the weighted average cost of capital in the sense of, or let's say the cost of equity in terms of what has been achieved for the market as a whole, that's the historical version of it. Obviously you then come to issues about whether there's been changes, you know, conditions looking forward are different from conditions in the past, but if we abstract from that obvious aspect. I pose that now because it seemed to be it would be worth hearing of that when we do the real options. Thank you.

MS BEGG: So when we come back, and I'll just check whether people are happy to come back at quarter to 1 which is three quarters of an hour away - sorry, quarter to 2. I can't see the clock properly, but that's no excuse, yeah, quarter to 2, so three quarters of an hour, would that be okay? Then we'll get back on track hopefully, and real options and asymmetric risk will be the subject.

Lunch Adjournment from 12.53 pm to 1.46 pm

MS BEGG: This session is going to focus on real options and their relevance for regulation, and Pat asked a question prior to lunch directed at Prof Guthrie. I had a perhaps related question which perhaps you can put into the answer. That is just whether there are any implications that are different in a regulated business versus unregulated, and in the example you were using when you were saying that the using up of options needs to be taken into account, the option to do something else, and I presume that affects cashflows that are then going to be foregone and that would be reflected into the asset value, which would offset, to give what we observe is a normal return in a market.

My question actually is, in the case of a regulated business when you destroy these flexibility options, the regulatory asset base doesn't change. I just wonder how that sort of fits together with the model in an unregulated market versus a regulated market, which I think relates to Pat's question but might not.

MR GUTHRIE: I think the answer there is that at the moment exercising those options doesn't affect the rate base and perhaps it should. That if you were in an unregulated firm the market will incorporate the values of those options in the share price in the value of the

firm. And so if you start using up those options you can imagine a firm making a series of investments perhaps too soon or too late or the wrong sorts of investments.

The fact that they haven't used those options optimally would be reflected in their share price. There's not the same market mechanism to do it in a regulated setting. And as long as there are no options being included in the rate base at all then there'll be no effect. So I think that's perhaps another reason why they need to be taken into account in a regulated setting.

MS BEGG: If the destruction of them doesn't result in the regulatory asset base falling then surely if you're using a WACC, say, plus a big margin to account for them, the overall outcome will be you'll earn more than WACC, whereas in the unregulated market you have the offsetting effects of the reduction in the asset value in the higher WACC.

MR GUTHRIE: Okay, well the suggestion I made in my submission, whenever it was, was actually that the adjustment was made to the rate base. I'd be quite happy for the Commission to use its estimate of the WACC as the allowed rate of return, but to incorporate some sort of option adjustment in the rate base. So that would potentially solve the problem. You'd only ever be earning your weighted average cost of capital, but it wouldn't be a weighted average cost of capital on your construction costs, it would be on the construction costs plus whatever options have gone into building that asset. So then I think it would, as you updated the rate base, those problems would disappear.

MS BEGG: The assumption there is there's a net destruction of options from that point on, because you're creating growth options obviously as well as destroying them, so the assumption there is that you are destroying them.

MR GUTHRIE: If I can go back to the real estate example, if I had a piece of empty land out there, maybe I've got planning permission to build a ten storey building. If I decide to build a five storey building that doesn't - it destroys on option but I've still retained the option to expand that out and build another five storeys on top at a later date. So the fact I have made some investment in the short-run, it hasn't created the option to build a ten storey building because I had that option originally; what it's done is it's destroyed an option to invest in a particular way.

So I think when I teach real options at a low level I talk about options that are created and options that are destroyed, but I think a more sophisticated story is that you have those options to start with and you're not really creating them, you're just - you're altering the portfolio. I had an option to build a ten storey building, I've still got it, but it's

just I'll do it by adding five storeys on to one I've already got.

You're right, though, in the sense that investment has destroyed an option. What's relevant is the net effect on the value of the options that you have, and it may be that some particular investments completely eliminate the possibility to do anything in the future and it could be that others you still retain some sort of flexibility.

So I think that on balance, you're going to be destroying more than you create in terms of the options that are involved, so that there still would be a net positive adjustment that you'd need to make, but it's not necessarily from 100% down to zero.

MR DUIGNAN: Could I ask - just a moment ago the implication of your question was that if you didn't count the options into the base, or your observed base at the start point of your analysis and you don't count destruction of options during the period you're concerned about, well then the options process is sort of outside the whole of the analysis.

Now my first question to you was that that did not seem to be the case for the market as a whole and so therefore in that sense the WACC would take into account options and if we applied it we would be applying a WACC that properly accounted for options on average.

MR GUTHRIE: Yeah.

MR DUIGNAN: Coming, though, to the regulated case, we're talking about firms that have been in existence for very long times, or rather assets that have been in existence for very long times, and I do think that if you are advocating that the Commission should take into account an option existing and an option destruction process, it is actually incumbent upon whoever is advocating that in the context of specific input methodology regulation to proffer a view about whether there is a, given the sort of relatively static nature of these businesses, any reason to believe that there's a sort of systematic process of option destruction going on, or whether it's a reasonable assumption to simply say well what was there at the beginning is probably there at the end, in which case it is irrelevant to our process. So they're two questions then, the second one, is this really relevant to businesses that are relatively static?

MR GUTHRIE: Going back to the first question, which I think is saying that firms exercise options all the time, that should be incorporated in the observed rates of return and that feeds through via the estimation process into the weighted average cost of capital. Now the key point there is that those rates of return are measured relative to changes in market value of the firms, so the share price today, the share price next year, you work out the

rate of return.

MR DUIGNAN: Plus any return paid out of course.

MR GUTHRIE: That's right. But the key point is that the starting value is the share price, or the market value of the firm, and the option value is incorporated in that market value. So if you're going to measure your rates of return using market values of firms, which I think is what you're suggesting and certainly what shows up in the data that goes into the market risk premium estimate, then the option premium isn't in that rate of return, it's in what you would pay to buy the firm in the first place. Which gets back to my point earlier on, that provided you include the option value in the costs, then the investment rule is NPV equals zero. So as long as - the option value is in the share price that you start with, and so there's no additional component needed or that will show up in the rate of return.

MR DUIGNAN: But that's suggesting that the options - there's no return being achieved in the period that we're looking at. Now if we're looking at longish periods for historical rates of return, then you are either saying again that the options are the same amount of options at the beginning as at the end, and so there's no need for a return on them because you're actually building back up your stock of options as you're using them up, which if it's true says that the option analysis is interesting but for the market as a whole it's irrelevant because the level is just staying constant; it's certainly important for individual firms but for the taking - that's the whole point about diversification, if that was what you were saying.

But on the other hand if in fact options are being - returns are being achieved on that bit of the asset base that is reflected in share prices, then it will be observed as a return. So either there is a return on it, in which case we observe it, or there is no return because in fact every time on average an option is extinguished or used up it is being replaced by a new one for the market.

MR GUTHRIE: I think the difference is between returns and between rates of return. And there is, in terms of dollars, there is a return in terms of cash. But it won't show up as a rate of return because you're applying 10% to $200 rather than 20% to $100. So you are earning - you do require cash compensation for the options that you're holding in your portfolio, not via a high rate of return but because you had to pay for those options when you bought the portfolio in the first place. So there is a return but it won't show up in the rate of return, it will show up in the amount that that rate of return is being applied to.

MR DUIGNAN: Well, we could resort at this point to a whiteboard which was done recently with mixed results, so we won't. **[Laughter]** But perhaps we should or we will be throwing this open to others. I must confess I'm not understanding how the point you've just made actually works, but perhaps it can be addressed in a submission with a couple of worked examples that I could see.

MS BEGG: And applied to the regulatory asset base it doesn't change because that's the bit of your explanation I don't understand.

MR DUIGNAN: Could I ask about the second leg of the question which was that isn't it reasonable to say that what we're talking about here is regulating companies that appear to be relatively static. If we were regulating Google well then there would be a lot of intangible because that's what in a sense your options could be viewed as being a form of intangible asset, but we are regulating companies that prima facie, and obviously with some issues regarding getting into telecommunications now, but generally speaking appear to be companies that do not have very large intangible or at least option values. So just as a proposition.

MR GUTHRIE: Well, I think one point is maintenance is investment too, and you have flexibility over how aggressively you maintain a network. And so some of these industries that may appear quite stable I'm guessing actually spend quite a bit of money over time and looking ahead to the next 20 years are going to have to spend quite a bit more. So they have flexibility over how quickly they replace machinery or equipment that's getting old.

If they don't have sufficient return to cover all of their costs, that is cash costs and these option values, then they don't have an incentive to invest in maintenance. So, you know, we can give up expansions of cables and power lines and all of these things. So there is investment even in those firms looking forward where the managers of those firms have options about when they invest, what they invest in and so on.

The second point is that firms are going to invest in the future and in order to make the assessment of whether they should invest they're going to look to see how regulated firms have been treated on their past investments. And if we're simply going to say well this investment's been sunk, they can't get out of it now, we're not going to allow them to earn the full cost, construction cost plus option values, then the next firm that comes along that is contemplating an investment can perhaps anticipate that in five years time once it's sunk its capital it's not going to get that compensation as well.

So I think the investment incentives are real, I think these firms are investing anyway, but even if they're not, other firms are going to be watching your cost of capital treatment to see what they can anticipate when they invest.

MR DUIGNAN: Could I just then wrap up this line of questioning by saying you just spoke about what we should do is to allow them to earn on the, what I'd call the augmented asset base, so asset base plus options. You spoke of them earning on that. I translate that back to the equity market when we were speaking a moment ago about the proposition that the shareholder base that we observe in the market at the first point of our observation, you know, ten years ago, that you have built into it the option value.

Now you've just told me that the Regulator should allow a return on that. Why would it not then translate over that the observed return on the market would incorporate the return on those assets, the WACC would be off that?

MR GUTHRIE: If you look at what happens in that market situation the option - your augmented rate base is the market value of the firm, so we had this discussion before about how $1 of ODV gives a $1.50 market value. That's the difference, the market value is the $1.50. The $1 is the ODV, and the extra 50 cents is the augmentation process that you're talking about.

MR DUIGNAN: Right, so I mean it's not that there's anything in - not anything unsatisfactory about the WACC calculation, it comes back to it would - if you were mirroring the market it would be in the asset base, it would not be in the WACC, though, we're clear that putting an adjustment to the WACC would not be to mirror the market, it would be to do it in a way that was not - is different from the market. It might achieve the same effect, but that if you were trying to mirror the market it would have to go into the asset base, that's where it would go, and then you would ask the question what is going to be the position regarding the option part of the base at the end of the regulated period as compared to the beginning.

MR GUTHRIE: That's a reasonable summary, yeah.

MS BEGG: So you'd be effectively depreciating your asset base when used up options over the period? You've got an asset base that includes options at the end of the period, they include less options because you've used some of them up?

MR GUTHRIE: That's right, yeah.

MR DUIGNAN: Which does lead me back to the proposition does seem to rely upon the idea that the options are being in some sense used up over the time as opposed to being created

just by the - and one asks what are they created by, they're created either by in fact the cash inflow to the company or they're created by the skill of the management which is recompensed by your operating costs. So it isn't clear that - they would have to be a net reduction in the level of options over the regulated period for there to be a problem.

MR GUTHRIE: And in the proposal that I made in my submission, that would actually happen; because what I'm suggesting you do is that you essentially multiply up the rate base by some factor and then you just apply your standard building block approach but with that augmented rate base. And so it's going to show up in the depreciation because just as your rate base falls over time as you depreciate it, so would the option value. So it is actually in there.

MR DUIGNAN: You would agree then, though, when you got to the end of the regulated period and you were now examining what had happened and examining for the next period, you would find, or you might find, that there was a level of options that had come in and was in effect additional value there; on the other hand what investors had contributed would be cash, they would not have contributed in any sense, it wouldn't be a cost to investors or to the firm, for that matter, for these new options which have appeared.

MR GUTHRIE: I'm afraid you lost me there.

MS BEGG: I think at this point we should hear from the others. I'd invite your comments on real options but also on any other asymmetric risk concerns you have. I note that at the previous Conference we talked about use of depreciation to handle the asymmetric risk with stranding assets, and that's something we've taken away and we're thinking about, because that's one way of handling an asymmetric risk that is of concern to businesses. But I just invite your comments now on these issues. And I'll start with Brent, we'll go anti-clockwise.

DR LAYTON: Thank you very much. My comment's fairly brief, and that is that I think the Commission should be quite sceptical about claims of asymmetric risk and claims of real options that are put up by companies to it. That's not to say these won't exist, but I think the Commission should be very careful to make sure that there is an asymmetry, or there is in fact a real option and there has been some change in that level of real option. So I think the scepticism is my overriding concern.

In terms of the airports of course asymmetric risk I think doesn't have much relevance on the subject of information disclosure, because they can set charges by Statute as they think fit, so they can have returns that are distributed like any other

particular company. So I don't see that they have a strong case for that. And moreover, in terms of if you move to a negotiate arbitrate model, that too wouldn't limit them in some rate of return sense either, it would mean that they have to discuss with their clients, like most people in workably competitive markets, about what are appropriate prices and so forth, but that's no different than in those markets. So scepticism and reflecting back upon the purpose of the setting of the rates is important I think.

To underline that I think the Commission has to be very careful, say, in terms of asymmetric risk that it doesn't start by being a bit generous in the determination of the parameters of debt premium, beta and so forth, because it's concerned potentially that it may under-pay, set the WACC too low and disincentivise investment; and then having done that decide oh well we will set the rate at a higher level, and the tails that Martin Lally was arguing they should be for, so they've now got a second premium built into it.

And then say oh well we've got asymmetric risk we better add that as well. The Commission I think's got to be careful that it doesn't keep compounding claims. Of course they then get claims that they need compensation because management are overworked and they get claims that firms have financial distress and that they needed compensation for that as well.

So I think the Commission has to be very careful that it realises that mostly it gets presented before it advocates for higher returns, and the Act is about the long-term benefit of consumers.

MS BEGG: Thanks. Stuart or Tony?

MR SHEPHERD: Just to put Brent's scepticism into context, I think it would be useful to go once again back to the Purpose Statement on this point to provide a sort of context for the discussion of what should be in and what should be out. And the same phrases I quoted last time was it includes, "to promote the long-term benefit of consumers" - as we all know - "promoting outcomes that are consistent with outcomes produced in competitive markets".

Now one of the outcomes that is well documented in the capital budgeting literature is that in competitive markets and elsewhere, but certainly in competitive markets, firms routinely set hurdle rates well in excess of their WACCs as derived from some form of CAPM model. And it's a widespread practise, I know you often hear of it from firms that are affected directly by regulation, but it's much wider than that.

And so it seems to me that the Commission does have an obligation to consider

what promoting outcomes that are consistent with those outcomes means. Because it appears that an outcome that is just applying a CAPM derived WACC on an unaugmented asset base, by unaugmented I'm just referring to the previous conversation around real options, is inconsistent, it's not consistent with the outcome that is observed in competitive markets. And furthermore, given that observation of high hurdle rates, it's hard to imagine how the Commission could assure itself that limbs A and B are with respect to incentives to invest and to improve efficiency will be met in a world where those high hurdle rates and decision-making processes of firms in competitive markets is not allowed for or not factored in.

MS BEGG: Could I just stop you there, because these firms that have these high hurdle rates which we've heard everybody applies that internally and we understand the point; but these firms are earning - their actual outcomes that we see in the market is that they've earned WACC, so they may have internal rules to, you know, to ration capital or whatever, but the outcome is what we see in the market which is the WACC which we're basing our WACC on.

So if we set the WACC for the businesses, that won't stop them using their hurdle rates of return which it would seem they need to use themselves for sort of management reasons to achieve the WACC that we observe. If what you're saying is everyone applies a hurdle and therefore it should be a higher WACC, then wouldn't we be observing the higher WACC? Or are you saying that as others have said that it's actually substituting for some things that aren't measured in the WACC or - I don't know.

MR SHEPHERD: Exactly, your last point that it's supplementing for the incompleteness of the WACC calculation.

MR DUIGNAN: When you speak of the incompleteness, I mean WACC is WACC, it is - I mean when we look at historical results and we abstract from the possibility of the market changing, we're just talking about for the moment let's say the future is going to be the same as the past, that is what they earned. I mean I think you may not have been here this morning when I spoke of the fact that I have set hurdle rates. You set hurdle rates for large projects and new businesses. You give authorisation to managers to invest in their existing business without a hurdle rate.

You set a hurdle rate, the term 'hurdle' is implying that you are looking for a, or expecting a Project Manager who is a promoter of a project and who is going to somebody who authorises him to let him go ahead with what he wants to do. It may be

the lazy way of doing it and it's not what corporate finance says, corporate finance says you should put in sensitivities etc, but practically everybody on the ground sets a rate above what they expect would be good enough because they are allowing for the optimism.

I really have to stress that that is the real world of corporate finance in companies, and that references to hurdle rates really don't get past that problem that if you interviewed executives they would almost certainly, the majority of them would sort of describe what I just described.

MR SHEPHERD: I accept that and the literature on capital budgeting identifies that as one of a number of reasons for this. I think the point still remains that capital is being allocated on the basis of a rate that is significantly higher than a CAPM derived WACC. And the result of that allocation is then measured from market data and there's a very real question which was discussed earlier this morning whether the model is providing a complete measure of it.

MS BEGG: Thank you. And moving down the table.

PROF VAN ZIJL: Probably not a lot that I could add to what Stuart has said and to what Graeme was saying in respect of real options, but fundamentally I think what we're trying to do in this area is to recognise that the model that's used to estimate WACC is an abstraction, it therefore leaves out some features of the real world, and what we're suggesting is that the Commission should consider adjustments to the result of the calculation in order to take into account those features of the real world.

And the issue of hurdle rates, well, it's an indirect form of evidence that the WACC calculation results in a rate that is probably a lot less than the rate at which firms are willing to invest. And if it was just simply to do with the promoters of a project within a firm being unduly optimistic or blowing up the revenue in order to compete with other promoters of other projects within the firm, then this issue shouldn't be related to the question of systematic risk.

But for example there's been a study recently which has reported that in the case of projects with significant systematic risk, that the gap between the WACC determined rate and the hurdle rate is greater than it is for projects that have mainly systematic risk, which is kind of contrary to what has just been said that, you know, that these gaps are just due to optimism and all the rest of it.

In terms of the real option argument, I think it's a very simple issue. If a firm has

an option worth, say, $50 then one approach that the firm could take is just to sell the option in which case they would immediately get the option converted into cash. If the alternative is to exercise that option to engage in some project that kills that option, then if it costs $100 of cash to exercise that option then clearly they're only going to do that if the benefits of that expenditure are going to be $150. So it's just, you know, sort of counter-rational behaviour to not take that option into account.

MS BEGG: Just the same point I had before about in a regulatory setting where your regulatory asset base doesn't go down when you exercise the options, it doesn't reflect the destruction of options, do you still think - does that not change the analysis?

PROF VAN ZIJL: The value of the options should be in there in the first place.

MS BEGG: That's the question, isn't it, if you do an historical cost valuation or even an ODV valuation, presumably it doesn't, does it.

PROF VAN ZIJL: It's not in there, no.

MS BEGG: So is the argument - just to divert sorry - about asset valuation, people aren't suggesting a hypothetical new entrant ODV style valuation, but we're talking about ODV plus all the potential options that might be destroyed in the future?

PROF VAN ZIJL: It's really to do with how do you achieve a result. The result that should be obtained is that the entity receives compensation for the use of capital equal to a certain sum, and you can get that sum either by adjusting the RAB or adjusting the rate that's applied to that RAB. And I think Graeme's suggestion is a very good one that you focus on the RAB because often option values will relate to the RAB rather than the rate of return. So as a research agenda it's probably more productive to think in terms of an adjustment to the regulated asset base than it is to the rate of return.

MS BEGG: As I understood Graeme's proposal it was just to add a margin to the regulatory asset base but now I'm hearing that you might start off by doing that and then you reduce the regulatory asset base over time as these options are exercised.

PROF VAN ZIJL: The asset base isn't going to reduce, that would only reduce if you made unprofitable investments. If you've got an option, say, worth $50 and you extinguish that, you're going to extinguish it, say, by spending $100, but if it's an NPV zero project you'll get $150 back so the RAB stays the same.

MS BEGG: Okay, well that's a different - okay, I think Pat would like to make a comment, then we'll go to Alistair.

MR DUIGNAN: If you were looking at building options into the initial regulatory asset base

then presumably when evaluating the overall outcome of the operation of the company you would be interested indeed to inquire as to whether there had been an increment or for that matter a reduction in the options at the end of the period, because clearly we are - I mean just as with any other change in value of an asset, if there was - if it was the case that there was more options available at the end of the period, that would represent a gain which in a total NPV sense should be taken into account. I just - it seems to be a logical extension of the discussion and I just wanted to make sure it was on the table.

PROF VAN ZIJL: Okay.

DR MARSDEN: Just a couple of points, I think the Commission has recognised two types of risks relevant to this topic, that's type one asymmetric risks which they describe as sort of lumpy and extreme in nature, and I think that that is relevant to airports in particular. We've seen, for instance, the risks of pandemics, SARS, 9/11, possibility of terrorist attacks, although we haven't had them clearly in New Zealand as yet. But there seems to be that this industry is characterised by these unforeseen type of events that are predominantly of a downside nature.

And my view then is that in terms of doing some expectations of cashflows that there should be some recognition of these risks. And it means from an information disclosure point of view too that if you observe subsequently returns greater than cost of capital well one of the reasons of course is that these asymmetric risks by their very nature, which may be unforeseen, may not have actually occurred.

So the way to treat them, I think, has been identified by the Commission is to try and model those risks in the cashflows, although I think in practise people will try to put some, or add some increment to the cost of capital for those risks.

In respect of the real options that we've been talking about, I notice in the Commission documents that they've been acknowledged by the Commission, and there are, I think, a number of ways to treat those as being discussed. One is an increment to the cost of capital, but I think that Graeme's idea of adding or applying a multiplier to the regulatory asset base is a very good idea, that should be seriously considered. One advantage of that is that it avoids any sort of further fudge factor that, or not fudge factor, but the alternative of trying to add it to the increment to WACC. So I think one of the advantages is this becomes much more transparent.

And airports do, I think, potentially face these types of risks in so far as some new infrastructure for airports are clearly long lived assets, that when you construct them you

are facing demand uncertainty. But also acknowledge that in respect of some airport developments there may also be some timing flexibility to stage those developments as well.

Just to pick up, sorry, one final point which is I think Brent's comment on, we talked about the choice of the sort of 75th percentile or something above the 50 percentile of the WACC. I think it's important to recognise that there is a difference here between those first type one asymmetric risks which I think should be recognised, and the second point about choosing something in the range which we'll discuss later seems to me more of a question around asymmetry of social consequences in terms of trying to make sure that there's sufficient incentives to undertake new investment.

MS BEGG: Thank you. MDL, I think you've expressed concerns, the asymmetric risk of asset stranding.

MR GRAY: Yes, we did, I think we've already given some indication of our thinking of that in writing. I think the thing to point out here is that the gas transmission business, we sink pipelines in the ground, all the investment's up-front and they're depreciated over something like 60 years I think for regulatory purposes.

In that period there's quite a lot of things can happen. Certainly the New Zealand gas supply isn't guaranteed for anything like that period and we also face substantial demand risk. We have customers, for instance, who are making commodity products that are sold overseas at widely fluctuating prices. And as a result of that the throughput in our pipelines can vary substantially as they bring plant up, run it and then put it on hold again.

We've also, as we've pointed out before, faced a considerable amount of legislative risk. I'm not sure which category that comes into, but some of the recent energy plans would have had a huge effect on gas sales and thus on the throughput through our system again.

Then in addition to that we face the normal other risks of a large widely distributed enterprise. The normal earthquakes, land slides, corrosion, all that sort of thing, but they're probably more of a normal sort. Thank you.

MS BEGG: When you're doing your investment analysis do you use any of this real option sort of insight to delay your investment, what it's worth, do you delay to the point where that option is recovered?

MR GRAY: I guess what we're talking about is an option to build a line to a new town or

something like that.

MS BEGG: Or your augmentation?

MR GRAY: Augmentation is usually done for safety or security of supply reasons, and that's not subject to a threshold analysis obviously because if we don't do it things don't work.

MS BEGG: Right, so you don't really have an option to delay.

MR GRAY: We've got no option for that sort of investment. In terms of looking at the extension of pipelines to a new town, I would think under current circumstances that would probably be difficult because if the value from the extension was to be regulated at the regulated rate it would have trouble in meeting the sort of hurdle rates that the company expects. Now we've not looked at any new investment but I suspect that - and very few other people have either - I suspect that might be part of the reason.

MS BEGG: Okay.

MR NEWTON: I'd just add that the point-to-point nature of the pipeline, in particular exposes the pipeline to, you know, quite significant asymmetric risk, particularly around energy policy and how that's evolving, it is significant risk. And, you know, there are only a few customers and so the risk damage to some of that plant reflects immediately on the pipeline.

MS BEGG: Okay, obviously we're running out of time I think on this subject, so I'll just ask you to be brief if you can.

MR REDMAYNE: Firstly with respect to real options and market wide returns, I mean just to reiterate the point, the real option value is implicit in opening market value and there'll be returns realised from those options that will be reflected in cashflows or dividends in the subsequent period, and at the end of the period there'll be some residual value in the options, and it's possible that that could have gone up or it could have gone down. So it's basically in the denominator and the numerator in terms of looking at returns, it's not sort of an explicit add on in a market-wide WACC sense.

With the regulated business if the regulated asset base is only looking at physical assets then there is no real option value in there, and if the firm subsequently earns some value or realises value from exercising real options then that would show up as excess returns because you haven't put it in the denominator.

So what Graeme has proposed I think is quite a tidy way of doing it. I think historically most people have treated this as something to tweak the WACC number with, and I think it's better to add it as a multiplier or addition to the regulatory asset base.

There was, I think, a point made about you've got the value of these things at the beginning and the value at the end, could you just leave them right out? Well you could make the same argument about land, for example, and of course the obvious thing you're missing out on is the return on the investment in that asset.

So I think the first order problem is that there should be some allowance made for a return on the investment in real options; and then the second thing that's come up is, you know, what happens when they depreciate or appreciate, and I think that's a second order issue which is, you know, depreciation or revaluation of them.

So I think initially some recognition that there's real option value, that should be included in the capital value of these businesses, I would see that as a first order problem; the second order problem would be if you try to measure changes in those from period to period, I think that's probably more difficult. So that's comments on that.

In terms of asymmetric risk and the effect on market-wide returns, there may be no visible effect because a party that benefits or suffers the asymmetric loss, there may be a matching party that gains as an asymmetric gain, so when you look at market-wide returns you wouldn't necessarily see anything showing up for that.

A final point, I notice on the agenda item it was unsystematic risk which we haven't really touched on and I'm not sure if I'm supposed to say anything about that.

MS BEGG: Feel free.

MR REDMAYNE: I just comment that, I mean there are unsystematic risks that are not reflected in CAPM or picked up in CAPM, but they do affect investors, and I think regulatory decisions come into that category. So, for example, any regulatory decision that defers the recovery of cash is perceived as increasing risk for investors. That's over and above compounding a WACC over multiple periods. And examples of that would be the treatment of tax recovery and a second one would be revaluation of assets. And in the case of the treatment of tax there's been some US evidence that deferring the recovery of tax expense results in a higher cost of debt. That's all I wanted to say.

MR BALCHIN: I'll try to better John for brevity. Turning first to the asymmetric events, my view is they're both real and potentially important. They are an empirical issue, so that's an area where to understand the importance you've got to look at the empirics.

The stranded asset risk may well be different across different sectors, it may well be that airports have a greater exposure, say, than the lines businesses. Again that's an empirical question and I'll sort of caution against making sort of broad assumptions.

I also agree with Commissioner Begg that there are different tools available, advancing depreciation is a way of effectively removing stranded asset risk. That's an alternative to having companies bear stranded asset risk and be compensated for that risk.

The choice between those tools, one way be useful for one situation, the other may be useful for another, so it may well be useful to retain both tools in the tool box for different industries.

One point about Brent's, I'd also caution against the assumption that compensating for these asymmetric events is somehow providing an additional margin or return. It's not, the WACC and CAPM gives you a target expected or average return, if you don't compensate for these things and you don't earn the WACC on average. So we're actually just talking about making sure that the forecast for the cashflows or the revenue requirement is consistent with the WACC you're actually setting.

Just a couple of comments more generally about real options more generally. I mean I think it's quite clear, I won't talk about distorting options or creating options because that sort of framework makes my head hurt slightly, but I would say that the real option theory certainly has important things to say about the choice of technology, the timing of investments, particularly in the sectors we're dealing with. It can tell you to build modular investments that may look more costly prima facie, but because by building modular you can defer your second and third augmentations to wait and see if the demand is there. That additional flexibility has benefit.

You can also say it may be efficient to invest in something that has a negative NPV that allows you to defer a major augmentation; for example, buying water meters and have usage charges for water, that can be something you can justify under a real option framework that may not fit under an NPV type framework for project appraisal.

Translating that into the regulatory agreement, it's quite clearly they're the sorts of things we want firms to take account of. We want them to take account of when it's socially optimal to defer, when it's socially optimal to build modular, to build things that look higher cost that allow you to defer big projects into the future.

How you then translate that into what you do as a Regulator, this is where I have to apologise and say I don't have a magic bullet. Designing comprehensive incentives for optimal capital expenditure is a really tough issue in regulation. I mean one approach is just to say look we can't do it, go back to being a central planner, do cost benefit analyses, and take account of real options. That's effectively where you've got to in electricity

transmission as we have in Australia. For other sectors there's more scope, I think, to design financial incentives. Some industries you've got no choice because there are competitors in the market and that's probably telecommunications where you can't actually be a central planner.

But just to emphasise, the insights from real option theory are important, particularly in the sectors we're dealing with, but incorporating that I think into a regulatory scheme in a comprehensive way is quite a hard task.

MS BEGG: Okay, Garth.

MR IRELAND: Just very quickly, just picking up Jeff's last point. You may or may not know that Graeme has published a book just in the last couple of months called Real Options Theory and Practise. Now just picking up the theory and practise and connecting it with his conclusion number 43 where he warns; "Financial theory is not currently capable of calculating a precise allowance for an investment flexibility, so the Commission is ultimately going to have to choose a level of compensation without the security of robust supporting empirical evidence".

And I think that's the task of the next step is to operationalise it. The question that springs to mind, would it be applied on an industry basis or on a specific basis, because I would guess that the bundle of options are different for every industry, every business, and hence the issue of how you actually measure those on a defendable basis.

MS BEGG: Okay, and just noting of course that it's not done by other Regulators except in some very limited circumstances which means we don't have guidance really from other Regulators which makes it difficult. Okay, Andrew.

MR SHELLEY: Just a brief comment on asymmetric risk. It's fair to say there really is asymmetric risk out there and it's not just giving the EDBs money for jam, there's real risks that if they go along to an insurance company the insurance company will say no, we're not going to cover it, and if these risks didn't exist the insurance company would be quite happy to take their money and never pay out. So there is an element of self insurance that goes on.

It would be fair to say that to date there probably hasn't been a lot of rigour around, in fact probably no analysis at all on what the size of the relevant premiums would be, but it is something that could be assessed. So I think a presumption that those risks exist is fair, and perhaps it is up to the - incumbent on the EDBs to actually do some work and get some actuarial advice in to advise on that.

PROF BOWMAN: I agree with Andrew, I think that such risks do exist, the magnitude of them of course is up for determination or estimation. It can be included as a cost, and the way of conceptualising that is to just think of it as an insurance, something that you'd like to insure against; if you insured against it the insurance costs would be allowable, so you estimate the insurance cost.

An alternative was just to think of it as a risk and risks get rewarded through cost of capital. So I think you could justify doing it in either direction, the estimation is the problem. But the fact that the estimation is difficult I don't think compels you to say well we can't deal with it.

MS BEGG: Okay, just a minute or two and we'll finish up at quarter to I think, anyone?

MR HOOGLAND: I think, just following on from that last point, I think that all Regulators struggle with how to value or how to price properly these risks which are sort of high magnitude low probability, the sort of earthquake or terrorist or whatever, and there doesn't appear to be a particularly sort of satisfactory solution; because to add that into the rate of return sort of leaves the Regulator and the business open to the assertion that well they're earning excess returns for no good reason. And the other issue is as we've said, you know, those risks probably aren't insurable in the commercial market, so you can't really find a proxy even in an actuarial study to come up with what a suitable insurance premium is.

The only, I think, saving grace for Regulators is with, you know, monopoly business is that there is at least some possibility of allowing pass-through after the event, but that also is something that is sort of unprecedented and uncertain, so creates its own set of problems.

MR BASHER: I was going to emphasise that same point for airports, just commenting on Brent's that we should be sceptical about these asymmetric risks, there's enough examples in the past sort of five years where we've had the pandemics and particularly the international impact of 9/11 that have been real events that have impacted on airport returns.

There's certainly not a practise for airports to be able to recover past costs from those events through future prices, and in fact there can be sustained impact on airports through two things; one is where really if your forecast base has come down because of those events they end up getting reset down to set a base for the new pricing period.

But secondly, typically also in that time the airports tend to get correspondence or

letters from the airline organisations asking for help from the airports, additional help from the airports in terms of pricing rebates or reductions or whatever to support difficult times, which inflates the risk or the cost against the airport pricing models.

MS BEGG: Thanks. Paul, do you have a -

MR BEST: Sorry, Peter Best.

MS BEGG: Sorry Peter.

MR BEST: AECT. I just wanted to comment on unsystematic risk. The Trust has made in its submission the suggestion that the Commission should take into account certain unsystematic risks or diversifiable risks, and one that was illustrated in the Trust's submission was that of the ownership structures that pervades the electricity lines sector in New Zealand.

I guess, I mean to everybody in the room here for which it's an affront to suggest that there should be compensation for such risks I do apologise, but I don't apologise, or I can't apologise for the fact that the majority of lines businesses in New Zealand are either Council-owned or trust-owned and those are structures that are likely to be in place for many years, you know, some 70, 80 years hence. And the general proposition is that that ownership structure will not change and that as a result of this naive, you might say, investment portfolio of a single investment risk, to ignore diversifiable risks in the rate of return will provide the owners of such investments an inadequate return.

Again I mean the theory obviously says well diversify, but I just wish to make - in relation to that I wanted to make the point that if, for example, AECT were to pull out some money and diversify, it's most unlikely to change the ownership structure, but it would have a significant impact on investment, and I mean just in terms of, you know, the magnitude, if I may, the asset management plans which the Commission has recently reviewed and published on its website yesterday, just looking through the Vector asset management plan, the scale of investment that's talked about is quite significant, you know, for instance in the first year of the asset management plan, the amount of capital expenditure that Vector is looking to expend is equivalent to the ODV of the bottom half, or the bottom 14 line businesses; and if you take it over a cumulative ten year period the amount of capital expenditure is greater than the ODV of any other line business in New Zealand.

And so I mean I'm not trying to make that in terms of a scientific point, but I'm just saying that to suggest that AECT should find a more efficient risk return outcome by

diversifying could easily result in a lack of investment, a lack of funds for investment in some of the lines businesses in New Zealand given that this is a structure that pervades the industry.

MS BEGG: Okay, I'd like to call it to an end there and hand over to Anita who's going to talk about the global financial crisis.

MS MAZZOLENI: But just before I do I'm just a little bit concerned about where we've left it, because once again the debate was extremely useful and interesting, but I think Professor Bowman you ended up by saying just because it's too hard to estimate doesn't mean that we should not do it, but I mean effectively it is almost impossible for Regulators to estimate.

So I mean I'd just like to do a quick whizz around the experts and for you to tell us what Regulators overseas have made allowances in their cost of capital for real options, whether they're doing that now or whether they're highly likely to be doing that in the near future. Some are obviously mulling it over as we are, but in terms of a, you know, a high degree of certainty about how this would be adjusted for certainly in the cost of capital I'd be very interested to understand. Brent, are you happy if we start with you again?

DR LAYTON: I'm not aware of anybody who's putting in real options so I'm not able to help you in that regard. That may just reflect, I don't know. But I'm still thinking about some of those questions that Mr Duignan raised and I'm not completely convinced that he wasn't on to something actually. That may be why they are not finding their way into asset bases.

MS MAZZOLENI: Tony perhaps or Stuart?

MR SHEPHERD: Just quickly, I'm not aware of any Regulator that explicitly allows real options, but I think the wider question and the more important question is how do they handle events as they unfold, which is part of the issue.

MS MAZZOLENI: Thank you. Alistair.

DR MARSDEN: Again I'm not aware of any Regulator that has made a specific allowance for real options, I think it's - I think some of the UK Regulators have clearly looked at it, but again I'm not aware of in adjustment they've made.

MS MAZZOLENI: Thank you, Troy.

MR NEWTON: I've got nothing to add.

MS MAZZOLENI: John or -

MR SRZICH: In the case of telecommunications I'm not sure where they're at but I'm aware that the European Commission has been looking at these sorts of issues in relation to fibre based investments, so it is a live issue and it's obviously something that we need to think about how we can implement in a pragmatic way.

MS MAZZOLENI: I agree, Antony, but they're probably looking at it in the same way we're looking at it here.

MR SRZICH: That's right, but -

MS MAZZOLENI: Thank you. Jeff?

MR BALCHIN: We talked about a number of things there, just quickly on the asymmetry/symmetry thing -

MS MAZZOLENI: No, no, if you can just -

MR BALCHIN: The symmetric real options?

MS MAZZOLENI: Answer the question - no, just in terms of other Regulators around the world, where are they allowing adjustments for real options in relation to the cost of capital?

MR BALCHIN: I can comment about Australia, I'm not aware of any.

MS MAZZOLENI: Thank you. Garth? **[No comments]**. Okay, thank you. Sorry, Tony.

PROF VAN ZIJL: It's one thing to look at practise, but it's another to infer from practise that that's the best answer. Sometimes that is the only thing that you can do, but I think in this case, and there is a widespread recognition that these options do exist, and as an example of a general class of items that are omitted from the Capital Asset Pricing Model, and therefore to jump to the conclusion that because other regulators are not making such allowances that that might in fact be an appropriate response is I think an inappropriate response, in that to assume that something is zero because you can't put a number on it with precision -

MS MAZZOLENI: I'm simply picking up the point that Professor Bowman left us with which kind of leaves us treading water, that just because it's hard to estimate doesn't mean we should do it, but I think is just the same point you're making, but it's almost getting to the point where it's impossible to -

PROF VAN ZIJL: No, the point that I'm making is the opposite one, that I think that to assume that something is zero when you know that it's not zero but you don't know exactly what it is, I think that's inappropriate.

MS MAZZOLENI: Thank you.

PROF BOWMAN: My comment actually was intended primarily for asymmetric risk but you could certainly extend it to real options. At the moment I'm preparing a series of lectures on mergers and acquisitions, and I'll spend about 45 minutes talking about real options within the context of valuations in mergers and acquisitions; admitting to the difficulty of it but the bottom line of what I'm going to say is that you can't ignore it, you know, anything's better than zero if you know it's there.

MR GUTHRIE: I don't think we should leave here with the belief that it's impossible to do this, just because people are choosing not to do it doesn't mean that it can't be done. I, for example, can recommend a brilliant book if you'd like to give it a go **[laughter]** and there's a whole range of models out there that people can use. There are many different ways to estimate the market risk premium. We don't say oh it's all too difficult we'll just set it equal to zero, you know, it's not zero, you make an honest effort to come up with the best estimate you can. There's no reason why the Commission can't go out and look at those models and make an honest effort to come up with the best estimate that it can. It doesn't need to just say it's all too difficult we'll just ignore it, you don't have to do it.

MS MAZZOLENI: I don't think I was implying that, I hope I wasn't. I'm simply suggesting that businesses find it very difficult and the question was really, you know, what Regulators around the world have allowed for real options and cost of capital, and if they have how have they done that.

DR LALLY: Could I make a brief comment?

MS MAZZOLENI: Sorry Martin.

DR LALLY: I don't find myself disagreeing with very much of what's been said by other people here on the subject of real options. What I would like to add to what's been said is the following, and it's a view that's shared by Stewart Myers and Julian Franks, that just because a real option exists and is lost or used up in the course of investment, it does not follow that Regulators should be compensating for that. The question that Regulators should be asking is are these options a manifestation of market power? If they are a manifestation of market power the question of their size doesn't matter, it wouldn't be appropriate for Regulators to compensate for them.

So I think the challenge for members of the industry is not simply to demonstrate that they exist and they are being used up, and even to try and put a number on it. Even if you can do all of those three things you've still got one thing left to do, you have to demonstrate that they are not a manifestation of market power. It is not the business of

Regulators to legitimise phenomena that are manifestations of market power.

MS MAZZOLENI: Thank you. Russell, did you want to add any final comment on this?

MR INGHAM: Well just briefly, I mean really it was just to pick up the point that if we look at a market level and you believe that markets are efficient then any portfolio of options that exists in theory would be valued and reflected in the share price and therefore over a long time those changes would be reflected in the returns that you would see ex-post.

I suppose related to that is that if you look at it on a RAB basis then yes, I can understand the concept of the portfolio of options having a value both at the start of the period and the end of the period, and you'd need to be able to evaluate those. And then also consider how it's changed because undoubtedly to an extent I suspect that some of the expenses that have been incurred are a manifestation of the resulting options that have been created, you know, certainly in terms of some new ones.

And really just I suppose the last point, and we've talked about this, is you know, the practical issues of identifying delineating and valuing, I don't see them as insurmountable, I just see them as difficult in practise, particularly in terms of the identification in delineating such that you are identifying all the options that really are there.

MS MAZZOLENI: And you would get quite a diversity of assessment, the businesses compared to the Regulator, for example, so that would need to be facilitated by quite a bit of information from the businesses.

MR INGHAM: Yeah, I think in practise that would be the case, yeah, in terms of saying what is that portfolio.

MR DUIGNAN: Could I juxtapose one question to be answered in submissions rather than now, which is would it be reasonable for a - as a hypothetical starting point to assume that in the absence of any information the value of options held by the market as a whole, but also in the absence of information by the regulated companies, at the end of the period would have gone up by the rate of growth of the market?

In other words if the, in as much - I mean that is implied by the multiplier proposal because it would be that when you got to the last day of the regulated period if you applied the multiplier, then the amount of options held at that time would have gone up by the increase in the level of the asset base or for the market as a whole would have gone up by the level of the total equity market.

And so part of the compensation the options held at the beginning of the period

would have come out of the fact that as we observe growth over time the option values are increasing because it's really hard to see that as we go through historical time we're sort of totally destroying options as opposed to creating them, the base case would be that they're going up as fast as physical capital.

I juxtapose that as something that needs thought, I don't think there's point in asking for comments on it, but it would be one of the questions we would pose, thank you.

COST OF CAPITAL AND THE GLOBAL FINANCIAL CRISIS

MS MAZZOLENI: Okay, so we'll pick up now on the impact of the global financial crisis on the cost of capital. And just by way of introduction to this, the global financial crisis has seen liquidity for debt and equity issues tighten sharply, base rates around the globe fall dramatically and borrowing margins increase sharply.

In submissions, parties agree that it is extremely unclear what impacts the credit crunch is having on the cost of capital parameters, but identified an increase in the cost of debt and equity including a fall in the risk-free rate which may also have affected MRP. The general view in the submissions is that in the present environment the Commission needs to adopt a highly conservative approach to establishing cost of capital parameters as there may be a long way to go before financial and consumer markets come back to more normal operating environments.

The Commission notes that other Regulators in recent decisions have reviewed MRP, for example AER in May this year increased theirs from 6 to 6.5, Ofcom again in May increased the midpoint of its range from 4.75 to 5 and Ofgem in August increased the midpoint for its MRP range from 4.5 to 4.9. This contrasts with the unanimous recommendation of Professors Myers, Franks and Lally to the Commission in December 2008 that the use of 7% MRP in the simplified Brennan-Lally formula is reasonable.

Tomorrow we've got pretty much most of the day addressing the specifics of estimating cost of debt and cost of equity including MRP, so there will be more than ample opportunity to discuss specifically how the global financial crisis has flown through into changes into those specific parameters. In this session, which we will keep to half an hour to get back on time, we're particularly interested at a high level in practically what parameters have parties changed in your cost of capital estimates as a

result of the credit crunch and when those changes were made and what led you to make them.

And if I could I would like to start with John from PwC simply because in the latest release of your cost of capital report you continue to, or you appear to continue to use an MRP of 7.5 which doesn't appear to have changed for some considerable period of time.

MR REDMAYNE: Yes, that's right, that's something we've debated quite a lot internally whether we should change that number, and I think you're right the observations you've made, there's been several changes in the market; the market volatility is up, credit margins are up, and I guess there's an expectation that probably the unobservable equity market risk premium is also up. When I say 'up' I mean those factors have been at a low level, I guess have really bounced up about a year ago and have sort of eased back a bit. But where they're sitting now I guess would look like to be some sort of higher level than what they were two or three years ago.

So we probably have got to some new sort of mid term level, I guess, compared to where we were a few years ago. In terms of whether we should change our market risk premium number, the purpose for which we apply that, I guess, is slightly different from the Commission. The Commission is typically looking at fixing a rate of return for one to five years, whereas we're normally valuing a business and valuing the cashflows into perpetuity.

So I guess we take sort of a longer term view on what the number should be and so that, I suppose, has influenced us not to change the figure. But having said that we - we don't just look at that in isolation, in the current circumstances I guess it's caused us probably to be a little more conservative about growth assumptions that are provided to us. We test that a lot more, and on top of that when we're doing valuations we're always running cross-checks on earnings multiple type valuations and that sort of thing.

So you're right, we haven't changed the number, it's something that we have debated quite a lot internally. I think the purpose for which we use it is a little different, that probably is a factor and I guess we have other ways of taking these things into account.

MS MAZZOLENI: Thank you. I might just start at this end of the room and go around both companies and experts, just again I'll repeat the question; we're interested at a high level, because we will address this in the individual sessions tomorrow, at practically what

parameters you've changed in your cost of capital estimates as a result of the credit crunch and when you actually did that and what specific factors led you to do that.

MR BASHER: Wellington Airport last priced in 2007 so it was before the credit crisis, it hasn't had to reconsider WACC since then.

MR ROBERTSON: There's been a lot of factors that affected our debt, but the areas that have affected our WACC have been in the debt risk premium, increasing that. And most notably in our recent work internally on appropriate returns for our embedded electricity business we've increased our market risk premium as well.

MS MAZZOLENI: When did you do that? Can you sort of identify sort of how much you moved that by?

MR ROBERTSON: A half a percent.

MS MAZZOLENI: Thank you.

MR BEST: It's not an issue that's come up for the Trust, although the literature reviews that we've searched out tend to provide slightly contrary results, or the results vary depending on whether it's a short-term view that's been taken or a long-term view.

MS MAZZOLENI: But you haven't made any change, thank you.

MR HOOGLAND: I'm advised in regard to Transpower the main change to the WACC has been the debt premiums which are fairly well observable in the market at the moment.

MR CARVELL: If I go back to my response to the earlier question about choice of Capital Asset Pricing Model, this response is in a similar context, because clearly a number of the firms around here are regulated and I think observation was made that it's prudent for those firms to be using the particular specification of the model, cost of capital model that the Regulator uses when they're setting their prices and their revenues. And I think that story runs for the input parameters as well.

So the extent that the Commission hasn't signalled changes, then in that context we certainly haven't actively implemented different parameters for those purposes.

MS MAZZOLENI: So internally per se you haven't made any changes?

MR CARVELL: In the context of our regulatory price setting and revenue setting. But as I said previously, more widely for business decisions we get external advice on cost of capital for that and we use different models. And certainly I think back in November 08 the board resolved to increase our internal hurdle rate, that was in the order of 300 basis points, but it's not - I don't have it at my fingertips at the moment to particularly point to whether that was debt margin or market risk premium, but I know the dialogue from the

board focused very much on both those factors, and in their view and the advice they received that those factors were certainly significantly higher at that time than they had been previously.

MS MAZZOLENI: So you left your cost of capital the same but lifted your hurdle rate, did I understand that correctly?

MR CARVELL: No, that would suggest that they'd increased that buffer or margin and I'm not saying that. The expectation of the - the impression that the board had was that debt margin market risk premium had increased and as a consequence of that our internal hurdle rate was increased, that's not to say that wasn't because of the underlying cost of capital.

MS MAZZOLENI: Okay, thanks.

PROF BOWMAN: Are you looking for comments from experts as well as -

MS MAZZOLENI: Yes, as well, yeah.

PROF BOWMAN: I think it's a -

MS MAZZOLENI: I think, sorry, Professor, just to clarify that, not in terms of sort of a general comment but specifically what you've changed in your advice to clients.

PROF BOWMAN: My advice to clients so far has been that they're not caught in having to make a decision right now. **[Laughter]**

MS MAZZOLENI: So you haven't changed any parameters, thank you.

PROF BOWMAN: But if I had to I think the place where I would start would be that basically everybody is dealing with the global financial crisis on the debt side, and so to ignore it on the market risk premium side just doesn't seem consistent. And I think it's, fairly indisputable that we'd expect that risk premiums have increased on both sides. So I think it would be appropriate to increase it.

MR MORGAN: In terms of the cost of equity we've not done any substantial work around the likes of the market risk premium. Probably similar to Vector we try to, I guess, align that to what Regulator might view that as being. Where we have adjusted is in the cost of debt, where the debt premium we are seeing that go up by a factor of three at least.

MR IRELAND: We have used an unchanged 7.5 MRP for the last five years or so. I think I'd just note that the global crisis is possibly more an issue of change in expected cashflows and hence would support valuation changes.

MR COCHRANE: Probably over the last 12 months we've looked at our risk-free rate as part of our pricing review, but probably the major change has been on debt premium, and as

we've seen a change in the market, particularly if you think about the banks' very short-term focus and increase in margins and a change in where financing is sourced from, both from banks to the wholesale markets, and seen a significant increase in debt premiums.

MS MAZZOLENI: Thank you.

MR GOODEVE: We've amended our debt margins to reflect the costs that we're seeing, that's not just in the margin it's actually the debt issuance costs have increased significantly as well we've noticed. And we have had some advice and have increased our market risk premium in I think it was December last year. If it wasn't December it was certainly earlier this year.

MS MAZZOLENI: And what's the range?

MR GOODEVE: From 7 to 7.5.

MS MAZZOLENI: And the issuance costs are bank issues as well as -

MR GOODEVE: The advice we have is other non-bank issues have gone up, but the bank costs which we're actually seeing have increased significantly.

MS MAZZOLENI: Jeff, did you want to make a quick comment?

MR BALCHIN: Yeah, I can just give you an overview of PwC Australia's practise. We didn't change the market risk premium but during the time when the bond rates fell very sharply there was a margin that was added to effectively return the bond rate back to - to have the same effect as returning the bond rate back to its previous long-term sort of long-run average level, because it was thought that it was not sensible to follow down the bond rates which in Australia fell by about 200 basis points in a short period of time, when all intuition was suggesting that the cost of equity certainly wasn't falling to that extent, if at all.

So we effectively kept the cost of equity levels at approximately where they were previously. And for firms that were particularly affected by the crisis there were firm-specific and industry specific adjustments that were made. But again the same caveats apply as to what - as John set out, that valuation exercise is long-term and DCF is just one of the factors in the mix.

MS MAZZOLENI: Thank you. Antony.

MR SRZICH: Over the last 18 months the cost of raising debt has been the highest we've seen for 15 to 20 years. While some stability has returned to the global financial market in the last six months there still continues to be significant execution risk related to the issuance

of term debt. With respect to the - I suppose the specificity of the question I'm not aware of any internal cost of capital calculation recently, I couldn't give you any specific numbers with respect to change of market risk premium or anything like that.

MS MAZZOLENI: Thank you.

MR BUZZARD: That's not a process that we actually go through as a company, we tend to be a smaller company than some of the larger corporates, but we have observed quite big increases in bank margins and also at a time when we're adhering to hedging policies, and we're not able to take a great deal of advantage of the actual lower interest rates swap rates that are happening at the time. We have also observed that if you go and approach a bank and mention borrowing money with them they're very reluctant to come forward and say yeah we'll have a facility there for you, albeit those requests being tongue in cheek, but they certainly stutter when you ask for a great deal of money is what we've observed.

MS MAZZOLENI: Thank you.

MR NEWTON: Like PwC we went through quite a lot of internal debate about what we would do as a firm of advisors, and KPMG came to the view earlier in this year that we would at least for the foreseeable future lift our point estimate within a range of the range of 7 to 8% from 7.5 to 7.75 and we've been applying that in our valuation work. And a corresponding adjustment to the multiples evidence that we've been using in supporting cross-checking some of our valuation work. But of course, you know, a lot of that debate was around what we were seeing in the cost of debt and it made a whole lot of sense for us to reflect that surely there must be expectations of a change in the cost of equity.

There's some other perspective I wouldn't mind just putting on the table here. One of the other things we quite often are asked to do is to review impairment testing, and in impairment testing quite often companies undertake their own valuation, and it's interesting in that context as to whether companies are in fact adjusting the market risk premium; and typically we're not seeing them make that adjustment and we're entering into debates about that because they are or have been taking the benefit of a lower risk-free rate in those discussions. But, you know, the incentives are slightly different in that situation.

MS MAZZOLENI: And the impairment testing is very much a one year view is it not?

MR NEWTON: That's right.

MS MAZZOLENI: Thank you.

MR GRAY: We made some adjustments because we set our tariffs on an annual basis as you

may be aware, and we ended up facing substantial changes in the risk-free rate which were indeed reflected in the tariffs. We adjusted the market risk premium up in line with the recommendations of Troy here, and we also adjusted the debt premium substantially upwards. The net result was actually that our tariffs ended up being less than they were.

MR NEWTON: Actually just a point of clarification before I let Don depart, we incorporated an alpha adjustment in the 2008 tariff as a consequence of perceptions about the Government's energy Policy Statement and what that might mean. We removed that in the latest and that had the effect of substantially lowering the tariffs.

MS MAZZOLENI: Thank you, Alistair.

DR MARSDEN: I think the financial crisis has done two things; one is obviously altered perceptions of cashflows, clearly increased debt margins. In respect of my view on the impact of the market risk premium I think it depends on your time horizon. Certainly over a sort of zero to five year time horizon I think there's been an increase in the market risk premium. If we look on sort of a very long-term basis, though, I think it will, you know, converge to what I've been using of around about 7.5% for the tax adjusted MRP measured relative to long-term bonds.

MS MAZZOLENI: Thank you.

PROF VAN ZIJL: Yeah, I'd concur with what Alistair has just said but perhaps just add the comment that if we estimate the market risk premium by a simple extrapolation from historical data on market risk premium, then the data on recent periods will reflect negative realised rates and therefore it might suggest in fact forecasting a decrease in the going forward rate. And that of course would seem inappropriate particularly for short-term estimates of the market risk premium.

MS MAZZOLENI: I guess we'll pick some of that up tomorrow when we talk about MRP. Stuart, did you want to -

MR SHEPHERD: No comment.

MR FORD: Not aware of any particular relevance to what sort of goes on inside our business in terms of the way that we go about pricing obviously. Clearly we can see, as can everyone in terms of what's happening in the global markets, maybe more of an issue for analysts that are looking at our business in terms of valuing it.

As I say, in the markets debt is obviously a bit of an issue for people as is access to lines of credit as much as anything. In the off-shore markets looking for places to borrow money it's very difficulty - it's got a lot harder to actually find it and it's a lot more

expensive.

MS MAZZOLENI: Kristina? Brent? Russell? **[No comments]**

DR LALLY: I think Anita you started off by making reference to the report that Stewart, Julian and myself prepared, and implied that our collective view that the MRP number of 7 did not require adjustment as a result of the global credit crisis. Did I understand you correctly?

MS MAZZOLENI: I think I used the words that are in the report which are that you recommend use of the 7% MRP was reasonable. There was no reference through to the credit crisis, simply I referred to the date at which that was done which was December 2008.

DR LALLY: Yes, the date on the report is December 2008 and as far as the equity markets are concerned the critical events are a few months before that, although the debt markets were affected 12 months earlier. However, the report was produced over a quite prolonged period, so I think it's fair to say that the number there of 7 does reflect our thinking prior to the implosion of Lehman in late 2008; that if we were sitting here today the three of us and giving you a view it might very well be different. So I don't think you should conclude that because the report is dated December 2008 that our view about the number is invariant to the global credit crisis.

If in addition to that clarification I could make a couple of comments. One of them is that it's very clear what this crisis has done to Government bond rates, they've gone south, and it's also very clear what this crisis has done to debt premiums, they've gone very north. What it's done to the market risk premium is less clear, at least from a measurement point of view. But in principle it seems to me very clear that the MRP must have gone up. The market risk premium is a reward for bearing market risk and market risk has clearly gone up.

The problem that you have, though, is in two areas. One is, is it just transitory? Even though the Commission is not coming up with an MRP number for purposes as long as those that John Redmayne has referred to you are still, in general, looking at periods of up to five years, and if something happens that only lasts a year before things come back to normal it would on the face of it be a mistake to raise the premium for the purposes of a regulatory assessment for a duration of five years. So that's one issue, what's the duration of this shock.

The second issue is the Commission seems to have a strong preference, if I'm

reading the revised draft guidelines correctly, for estimating the MRP through the backward-looking historical averaging Ibbotson type technology. And the problem with that, as Tony has alluded to, is that this kind of shock which sees equity values drop, and the MRP probably go up, will manifest itself in the Ibbotson technology as a lower estimated MRP, so in quite the opposite direction to that which it should be moving in.

And to me that illustrates the need to in arriving at an MRP estimate to look at forward-looking methods as well as backward-looking methods. Of course if you put any weight on backward-looking methods you'll still be subject to this drag that it moves in the opposite direction to what it should be. But I think there are trade-offs in this area, there are deficiencies in the forward-looking methods that should make you cautious about putting all the weight there, but this kind of event I think perfectly illustrates why you would not want to put all of the weight on historical averaging type methods.

MS MAZZOLENI: Thank you. Certainly appreciate all those comments; particularly appreciate the clarification in terms of the comment from the expert panel. And in terms of the comment about it being, you know, how long will this last given that we're looking at regulatory periods from three to five years. I mean it's crystal ball, but I guess many of these firms are refinancing at the short end and refreshing their long end box as well. And on that note -

MR DUIGNAN: I just would note that we have studied the quotations from Professors Myers and Franks that are quoted in one of the PwC submissions and they are interesting when read fully in the context of what the issue that was being discussed at the time was in the UK. So certainly we found it valuable to look at those quotations in their full context and might suggest that anyone else who is looking at them might equally like to find the references which are on the Regulators' website if anybody - I don't think it's particularly appropriate for us to go posting references to another website on ours, but they're not hard to find, so thank you.

MS MAZZOLENI: So afternoon tea, back at 4 and Pat's going to take us through leverage.

Adjournment from 3.26 pm 3.54 pm

LEVERAGE

MR DUIGNAN: Right, we'll reconvene and thank you to everybody for being available

promptly. Just before I move into the question of leverage could I note that we had quite an interesting discussion about real options and the theoretical aspects, just to recall that the position following the experts' report is that the Commission confronts both major obstacles of an analytical nature regarding any question of allowing for real options and also one of a pretty significant nature regarding the issue of distinguishing between options that are due to the natural monopoly characteristics and market power that goes with it versus other types of options, and so we would need, if that matter was to be explored much further, input from the industries regarding those aspects.

I turn now to leverage and to facilitate this discussion we circulated a graphical representation of the effects of leverage on the results of two CAPM models, the Classical and the Brennan-Lally. I think Alistair Marsden asked what were the - an issue about the underlying assumptions. As I indicated they were those out of the straw person. And in regard to the specific question of the beta we effectively have said for this purpose let us assume we have the asset beta, in fact we get some of our asset betas from overseas, so in those cases, you know, the model perhaps that you are going to use to derive the asset beta, so let's say that we do have that number and then we convert that into an equity beta by the appropriate formula for the model that's under consideration. So just to clarify that.

I'd make two observations and ask for comments on them. The first observation is that a number of the submissions have advocated that the Commission should adopt a higher leverage assumption than indicated in the straw person.

Secondly, I note that in the earlier discussion regarding firm-specific versus industry parameters there was a difference of view as to whether it should be a nominal leverage versus a firm-specific leverage, and so I think it's appropriate for that to be explored further.

I then note that in regard to the last discussion on the global financial crisis that the increase in debt premiums could be suggestive that although not achievable at present, logically the target leverage ratio might in response to such a development be reduced. In other words if you face higher debt premiums, as you appear to, then one might expect that your target ratio of leverage would be reduced. Obviously it's not a very good time to achieve that reduction but nevertheless that would be one response.

And then finally the upwards slope of the effect of leverage on the results of the Brennan-Lally model does seem to create a perverse situation that it creates in the first

place an incentive for a great deal of submission activity directed at increasing the leverage number; and secondly I must observe, and it's quite significant to me that it kind of violates the test of commonsense and quite severely, that we have in fact as the Commission the strange situation that in we're being invited to increase our leverage by firms that on the one hand have taken on higher leverage positions which would seem to imply that they believe that to lower their cost of capital, but the results when translated to a model are that it increases it. So there's a contradiction there between reality as I perceive it and the model which we have to consider.

So there's a suite of questions there and I would invite you to cover them as you see fit, but the bottom line is the view that the Commission should take on this issue and its role in our work. I will invite questions. I might start this time just cutting out our two experts on this end of the table for the moment and start with Brent Layton if I could. We'll go around in the opposite order.

DR LAYTON: Thank you very much. My comments, first of all I think yes, there is an anomaly here with the simplified Brennan-Lally leading to leverage increasing the WACC and I think that does need to be sorted out in terms of it. I do think there are real advantages for regulatory stability, though, in using the simplified Brennan-Lally and this morning's evidence from various experts and industry parties showed it's widely used and accepted in New Zealand. So one would be reluctant to throw it out.

But that leaves then really the only other option is thinking of what do you do to in fact ensure that you don't get this what appears anomalous result, both in terms of what one expects from one's understanding about the effect of full imputation credits, no capital gains, corporate and marginal personal tax rates being set as the same on a WACC; what most people including the experts, two overseas experts commented would be some flatness of that relationship, and the actual outcome when you go through the numbers.

So I know that some parties have argued for zero leverage, that's still - I can see that's a solution, but then firms do in fact have leverage, and one would assume across them there's some rational reason why they have it. And so I think we do have an issue that I'm sorry I'm not able to provide the answer to, but I think it does need a resolution from the Commission.

In terms of the other issue raised at a more practical level, in the straw person I notice that electricity generator/retailers are included in the database from which the

leverage is being calculated. I would suggest that they aren't in the same business as electricity lines companies by a large margin and their inclusion in fact provides a significant distortion.

But I am setting aside this question about the Brennan-Lally and whether the way to resolve it is to set the leverage as zero, setting that aside. I am a fan and I think it was Jerry this morning actually who said well why don't we just use the company's leverage if we need to use a particular leverage. So setting aside that there may be a reason for moving to zero leverage is the assumption that's there. If the Commission is of the view that there should be a leverage rather than an industry-wide one, I think the presumption is that why would firms not be looking for a factor, subject to some sort of sanity test as to whether they've taken on a ratio that's consistent with the overall activity of the business and subject of course to being able to sort out what's the regulated component from the unregulated component when they are mixed.

MR DUIGNAN: Thank you, if we could move on but just note that our experts did advise in favour of a benchmark leverage ratio, so it should be borne in mind that is the advice that we received regarding that and was summarised by one or two of the speakers earlier. So interested to hear contrary views, but to be - that's the background, thank you.

PROF VAN ZIJL: The corporate finance literature talks about various factors that might influence the choice of leverage level. And so, for example, one factor that might impact on the choice of leverage level is agency costs in the sense that with debt will come some benefits from additional monitoring from the debt providers. In other words if you go to very high levels of leverage you're likely to incur bankruptcy costs. And so in a general sense one might expect that leverage will initially, the increased leverage will initially lead to a lower cost of capital, and eventually it will increase again.

Well those considerations, agency costs and bankruptcy costs of course don't appear in the Capital Asset Pricing Model, so we don't see that pattern. What we do see is simply the reflection of the assumptions that we make with respect to taxation. And in the case of the Brennan-Lally model, there of course we assume imputation which should lead us to just a horizontal cost of capital result; but we then go and combine that with inconsistent assumptions with respect to the cost of debt in that we assume that on the one hand we do have to pay a rate of interest on debt higher than the risk-free rate, but we assume that the beta for debt is zero, and as a result we get this apparently surprising result that the cost of capital goes up with increasing leverage.

Well in more normal times that would produce a difference of maybe 0.2 or 0.3 of a percent on the WACC compared with perhaps a lower level of leverage, but of course at the present time with higher debt premia this factor becomes more significant. But whether it's something that the Commission should be become very concerned about I'm not too sure. A if we try to assign non-zero values to debt betas we would get into the difficulties of estimating the debt beta, and it's difficult enough to estimate ordinary equity betas let alone debt betas. And in any case we miss out bankruptcy costs and bankruptcy costs alone might in fact explain why the thing bends up again. So the fact that it does bend up is perhaps not inappropriate.

In terms of choice of a level of leverage for regulation purposes, I mention in my comments this morning that estimation is in principle quite easy in the sense that you can actually observe what firms do, but that of course needs to be tempered by the sort of considerations that other speakers mentioned that the entity might be part of a larger group. It may also reflect just the fact that the entity is close to another equity raising, and equity of course tends to be raised in large lumps rather than continuously in small lumps.

So possibly in terms of estimating leverage perhaps rather than actual planned leverage might be a better basis, and whether you then have different levels of planned leverage across a set of firms in an industry I think you can kind of resolve by instead of taking a single estimate take a reasonable range that seems appropriate to that industry and work with that range rather than a point estimate.

DR MARSDEN: I think that businesses should be allowed reasonable flexibility over their borrowing policy within some sort of reasonable bounds of leverage. If I could just, though, address this question of this sort of upward sloping line under the simplified Brennan-Lally model and is it an anomalous result. My first comment is that, I mean it would suggest that you may want to go, if you want to minimise your cost of capital to a zero percent leverage, but we don't observe that in practise that many companies will typically adopt that position certainly on a long-run basis.

The other thing I think that's, at least in my view, is that when you think about an asset beta you've also got to think about the particular beta degearing or leverage formula that you use. And just going back to the example where you said that what you've done in this particular example is take an asset beta, and I presume that you've assumed the same asset beta under both the example of the simplified Brennan model and the Classical -

MR DUIGNAN: Yes, we have.

DR MARSDEN: - model, let's just assume that was the average asset beta of the market, well you would get then, you expect the equity beta to be one but you would get a different equity beta applying the Hamada formula as opposed to applying the Harris & Pringle formula. So it seems to me that when you think about an asset beta you need to think of that in the context of the actual deleveraging formula that you adopt given that we observe equity betas in the market. So that means that if you want to model debt betas and if you were able to do that, that upper sloping line would seem to flatten out a lot. You also need to think of well, what is going to be the impact on the asset beta, my measure of asset beta using a different deleveraging formula.

So I don't have any problems with the current approach because, and I think the error would be very small on the basis that provided your comparable company set, if that's what you're using to measure comparable equity betas, is within a sort of a reasonable bound of the comparable leverage of the firm that you are trying to determine the WACC.

MR DUIGNAN: Could I just intervene there, that unfortunately I don't think that works in the sense that if you actually look at the straw person, the actual leverages observed are widely different, and that I think that we see it as rather a more problematic matter than you've indicated.

I mean the range resulting from the leverage assumption between 40% and 60% is 27 basis points, in fact, sorry, yeah 27 from 7.10 to 7.37. So I don't think we can just sort of regard it as neither here nor there. I personally see it as quite a significant issue that forces us to consider responses to it, one of which of course is to decide that we'd like to be on both the models, namely at the point where they intersect.

But that's just one sort of rather easily expressed way to respond to what you have in front of you. I would stress that I'm raising this issue because I see it as a significant issue on which we therefore would be interested in views post this discussion rather than just purely a technical matter.

DR MARSDEN: Sure, I'd be very happy to make some submissions on that.

MR GRAY: We have a particular problem in that we're an unincorporated joint venture as I think most people know. That means we don't have a balance sheet or any debt. Most useful for us, the most useful point for us would be if there was an industry-wide debt level agreed then we could use it in our calculations. Thank you.

MR BUZZARD: One of the entities that we look after is also an unincorporated joint venture. We have the same issue, we feel it would be much better to take a nominal approach to this as you're heading towards in tax as well. And I guess you could look at the industry as a bit of a check on that, but you've got to take into account that there's an awful lot of energies in this industry and the lines businesses who have got very lazy balance sheets. They probably want to buy the neighbour if they came up for sale and they'd be too scared to miss the opportunity by carrying a lot of other debt in their balance sheet if that happened. Yeah, so for those two reasons I would very much go for a nominal approach.

MR DUIGNAN: Could I just also as we go around just ask you to bear in mind the concern that I referred to that the net effect of having, for the industry, the incentive that persuading the Commission to adopt a higher leverage number has a significant effect on the weighted average cost of capital and therefore all things regulated is, as I see it, a perverse incentive and one that is undesirable that debates over market risk premia and such like, those are matters which don't potentially lead to perverse behaviour, but if it was believed to be the case that because of our choice of model there were major advantages to leverage, that would not be desirable. So this is why I see this as a very real issue for us.

MR REDMAYNE: Okay, I think on that particular point use of industry-wide or notional leverage presumably would reduce those incentives. Looking at the chart with the simplified Brennan-Lally model, if you have no debt premium then my understanding is that you should end up with a flat WACC curve coming out on that chart. So it's the introduction of a debt premium on the debt side, or the inconsistency which Tony has alluded to.

If you want to fix that in a technical sense then what you really need to do is introduce debt betas. In other words the premium on debt would be viewed as being explained by a debt beta times the market risk premium, and once you plug that into your beta delevering and relevering formula, my understanding is that again the simplified Brennan-Lally WACC curve should be flat. We can probably work up some examples in our cross-submission on that point.

So I guess that leads to the question should we then have debt betas and? I would advise against that, I think that isn't really going to add anything helpful in terms of a final answer, it's going to create a lot more work and a lot more debate and there's a lot of uncertainty as to how you go about accurately measuring the things and so forth.

So my preference would be to stick with a model that doesn't have debt betas, and

if the model is showing that there's a big incentive to increasing debt I don't really think that is the case in the real world and come back to what Alistair said, if you're working within a normal band of leverage then the effect on the model shouldn't be so great.

I understand you're saying it's still - the difference can be 0.275 and that could be material in the decisions that you make. I guess if it's only relating to the leverage then, you know, maybe you stick to a midpoint estimate on that parameter for the effect of that, and/or look at the Classical CAPM, the results you get from that model.

Some other points on debt, I think on the leverage obviously there needs to be consistency between the assumption there, the assumption about the credit rating, the debt premium estimates, and I guess the financeability checks or the cross-checks on interest rate coverage and so forth. So that whole package of stuff needs to tie together.

In terms of the worked example, the straw person example, the comments I have on the leverage I guess extend to debt premium and also the beta estimates, there's obviously a lot of calculations underlying the information that's been presented, and I didn't really feel able to make any sort of thoroughly technical critique or analysis of that without seeing the underlying data. I guess if the Commission is going to be going through these exercises rather than everybody going and replicating that, I mean the provision of more information to the parties would probably be quite helpful.

A general point, I also have regards to sample selection and other comparators. And on the leverage there's a sample of companies and then there's a second table which is what another Regulator has analysed. And something similar comes up in the debt premium and in previous work from the Commission similar things have come up on betas and I personally feel quite strongly on this point. I think that you should define quite accurately what the sample should be, what sort of companies you should have in that, and go and do the analysis thoroughly on that set of companies, and to then look at other data sources which in effect will double count some of those companies and include other companies that for whatever reason you didn't think should have been in your initial sample, and furthermore there's going to be probably different methodologies used in the other studies so you may not fully understand, and they probably cover different time periods.

I think all of those things are undesirable and there's not actually so many companies out there listed in the world that you're not able to accurately define your own sample in the first place and then thoroughly analyse that without then, I guess,

cross-referencing in these other calculations, which I think if anything taint the original calculations, they don't really add to them in my view.

MR DUIGNAN: Thanks, the last comment is certainly interesting, and I can see where you're coming from, I've got sympathy with it, but it does kind of contradict a little bit the advocacy elsewhere, not by yourselves, but of course of cross-checking. And so can I say it would be appropriate to have a brief note regarding the point that is now on the table of the cross-checking could lead to blurring the data source, and I think that it's a valid point but would be interested in other views, not necessarily in this round, but in due course, thanks.

MS MAZZOLENI: Could I just clarify one point, because do I understand you to say that you would be, I guess as Dr Layton suggested, knocking out anything other than the lines businesses in the straw man calculation?

MR REDMAYNE: Not necessarily. In that particular case I think I would probably knock out anything that's not a line business, but I think the point is that you should identify what companies would be comparable and include them and analyse them once and then not bring in additional studies as if they're supporting information, because I don't think you have to drill down into what should be in the sample in the first place, and if you do that accurately then there's no need to be looking at other sources of information. Perhaps as a sort of off the page cross-check but I don't think they should be used to influence the analysis that you undertook on your prime sample.

MR DUIGNAN: Thank you, and if we move on.

MR GOODEVE: If I could just make a comment about your concerns that the current derivation of WACC may lead to businesses racing out and getting as much leverage as they can lay their hands on, there are a number of real world checks on that around the shareholder expectations. I'm sure AECT, for instance, would be somewhat concerned if Vector rushed off and tried to get a lot more leverage than they currently have, existing debt providers and their securities provide an ongoing limit on where you can go, and there is also an ongoing restriction in the New Zealand market and international markets about actually how much debt you can raise. So I couldn't perceive a situation where people would be able to radically increase their debt to take advantage of an anomaly like this.

MR DUIGNAN: Thanks, it's a dual concern that we may have as a result of this a New Zealand specific incentive to dwell on leverage excessively in our regulatory process and that if

then we added to that by adopting the, yeah, the suggestions which have been made for good reason, that we use actual leverage, then we would translate an excessive discussion into an incentive not to suggest that people would succumb to that incentive to ludicrous extents, but nevertheless are an incentive that is at the fundamental level perverse. And so those are concerns and we're looking for ways to entirely eliminate at least one of them and hopefully both.

MR GOODEVE: No, I can understand that. I guess the other comment I'd make is 60% leverage is not exceptional in world standards, there are a number of Regulators that currently have that as their assumption.

MR BALCHIN: Your concern's a real one about not wanting to encourage firms to do unusual things in response to incentives. And that was part of the reason why earlier I put in some strong advocacy for using benchmark financial arrangements for that purpose.

In Australia this issue of leverage isn't as direct because under the Officer version of the WACC the WACC line is quite a lot flatter than what it is over here, so small reasonable plausible changes to leverage actually don't change it much. So I'm not aware of it being raised much of an issue at all over the last five years. 60% debt to assets is the standard in Australia across all of the energy sector.

Now in the context of the Brennan-Lally WACC, clearly this line seems anomalous. It reflects in part the - I don't think it's actually a true prediction of how WACC changes over those leverage levels, I think it's an outworking of a formula which is only an imperfect description of how the world actually operates. What to actually do in response to that, I think that's one of those questions that where you need a few hours in a dark room with a wet towel around your head. So I think that might be an issue to come back to you on.

MR DUIGNAN: Thank you.

MR COCHRANE: I'd just like to make some comments on leverage. There's been a lot of discussion over the last few minutes about electricity lines businesses which are businesses where you have relatively incremental investment happening all the time. I'd like to draw the difference between electricity lines businesses and airports. Using our example we have a leverage under 20% at present but we're just about to embark, or we are embarking on a $200 million investment for a new terminal. That's going to take our average leverage up to around the 40%s.

So in terms of using point estimates I'd have a concern about that because it's

looking backwards and therefore we should be looking forwards at what the long-term position is going to be, and therefore I would be comfortable using a notional leverage, as long as it reflected that there is a difference between electricity businesses and airport businesses who have large lumpy sums of investment happening every so often which is quite different. So I would be happy with a notional leverage as long as it reflected that longer term perspective.

MR IRELAND: Now I'm the one that promoted the leverage equals zero, and have in my submission and cross-submission spent about 15 pages going into the issue, and the solution that came out of it was that given the formula should reflect tax neutrality, where L equals zero, that's the beginning of the flat line. So in effect that reflects the fact that WACC is indifferent to leverage, and to me that is quite a simple outcome, it's got nothing to do with what actually happens in the real world because you can choose your own debt equity policy along that flat line.

What it does do, it simplifies it for the Commission, the Commission doesn't have to concern itself about company's financial policies, debt, leverage, all it does is says that in fact cost of equity equals WACC and that's it. Now it's non-intrusive so we don't have this debate. What I have done, and again is to illustrate that this is not a trivial issue, that in the submission I use the gas pipelines decision in 2008, and quantified the 40% L and the 2.7 debt premium.

What that means in terms of the total regulated assets of $12 billion, so it's the whole of the Commerce Commission domain, that WACC would rise by about 0.75, which actually would convert into an excess profit given that WACC would be lower at L equals zero of around about $91 million per annum, so that is equivalent to charges each year that everyone will bear in excess of what would normally happen in a sensible market by about $130 million.

Now in response to - I redid some figures yesterday which then addressed the issue of 60% leverage, 2.7% margin, which was the Powerco one, and in fact the WACC now increases by 1.13% which converts into excess profits of something like $136 million, gross it up for charges is about almost $200 million per annum. If you net present value that, and that includes - it gets locked in forever - we're talking about a $1.5 billion net present value figure.

So I think the issue is rather significant and I agree with Pat that it violates everything except that when L equals zero everything locks in.

MR DUIGNAN: Whether it's excessive profit, the point is that it's an additional variance in our analysis that is driven by this one parameter and does not seem to be kind of -

MR IRELAND: It's excessive in the sense, Pat, that the risk reward is met at L equals zero and hence the leverage which causes the capital charge or the normal profit to increase would have to be excess, if you like, over and above the normal profit.

MR DUIGNAN: Yes, I just make it clear that from the Commission's perspective we wouldn't necessarily jump to the conclusion that it was excessive profit, we would be concerned, though, that it is an example of the scale of the incentive that I was concerned about and that the variability due to this one parameter gets to look rather excessive in that respect. So if we could move on, I hope we've now registered that this is a live issue on which perhaps hasn't had as much attention in the past as it perhaps warrants.

MR MORGAN: Probably just an observation, I agree that the steepness of that curve looks, I guess, counter-intuitive and like others would like the opportunity to go back and look at the impacts of leverage, given that the work that we'd done previously suggested that there wasn't a great impact between 40 and 60%. But I guess in terms of the leverage we're not uncomfortable with the Commission's approach that they've taken in the straw person, and in fact that's consistent with some analysis we had done a while back by some of our financiers which came up with a similar range.

And the other point, I thought - I might have mis-heard - but there was a comment about that if debt premiums were currently high that firms would look to sort of delever, I guess I just make the point that where we're in the midst of a significant capital expenditure programme, debt funding for some of us is our only source of funding, and we're also still expected to pay dividends to our shareholders.

MR DUIGNAN: Thank you.

MR SHELLEY: As perhaps a counter to a little bit of what we heard before, I mean we clearly need leverage in the calculation, there's a real impact on firms from the cost of debt that we heard about in the previous session, and I think the other area where it becomes very important is when you're starting to look at financeability tests, and possibly in the context of a CPP, an excessively low level of leverage that might be used as an industry-wide benchmark becomes a problem if firms then get to needing to prove a financeability test and have to justify what might be a perfectly reasonable financing decision but results in a higher level of leverage.

So I think a point would be a benchmark level of leverage is fine, particularly

when you're in the context of a DPP, but there needs to be that flexibility there in continuing to look at what firms actually do when you're coming to a more firm-specific mode of regulation. On the slope of that line, to throw an option out there, Jerry mentioned this morning that he favoured the Officer CAPM, and Jeff mentioned that in Australia they haven't had these issues with the slope of the line being so high.

Now I recall Martin demonstrating at some point how the Officer CAPM is essentially a simplification of the full Brennan-Lally model when you make some simplifying assumptions it condenses down to the Officer CAPM is a simplified version, albeit not as simplified as this, so maybe there's a half-way house in the middle there that might sort of ameliorate some of the effects that we're seeing, but Martin would be the one to comment on that.

MR DUIGNAN: Thanks. I won't divert it to that matter right now, but I should just comment that we are going to discuss financeability tomorrow and just to make sure there is a distinction that I don't see this leverage discussion would ever sort of be a constraint upon a financeability test. A financeability test for me would always have to address the situation, you know, of a more real world nature of the specific company, so that I think - I know Unison expressed a concern about sort of leverage affecting financeability kind of automatically, I just -

MR SHELLEY: Yeah, I think this is a concern borne out of Unison's previous experience. It looks like we're heading into a completely different world now, but I think it would be fair to say that given Unison's previous experience there was a benchmark leverage that was suggested was then going to reflect through into allowed interest and then applied financeability tests were quite fine, but if you looked at actual leverage then there were some financeability issues, but that was several years ago now.

MR DUIGNAN: Thank you.

PROF BOWMAN: I think there's two things going on here that you need to input to get these sorts of graphs, and I find it's interesting that they're all nice straight lines. One of those was raised by Alistair and that is the gearing to gearing formula that you use. I don't remember for sure, Jeff, but I think that the key thing that makes the Officer indifferent is the gearing, degearing formula. It's not so much Officer, it's the gearing/degearing formula that's used. Now I haven't done numbers on that in years, but I would hope you would get some cross-submissions on this. So that's one point but that's been raised.

The other thing that effects this is what you assume about the cost of debt, and a

couple of people said that well in the Brennan-Lally model we should have a straight line, a flat line, and I don't think that's really true, not in kind of a real world out working using that model, and not true in two points. The most obvious one is although it's omitted in the model itself, and Tony alluded to this, I think we would all agree that if you push the boundaries on the upside of this your cost of debt is going to rocket and that's just standard. And clearly I would assume here that it doesn't rocket as you get up high.

So just the classic kind of pictures you draw it's sort of U shaped, and what kicks in in the classic pictures textbook is tax advantage to debt, financial distress disadvantages of debt. And so it may be that out here to the right-hand side of this, if anything maybe we need more of an uplift.

But even on the low side and you characterise debt, and at least at some low levels I think you can, that at very low levels of debt the cost of debt is quite insensitive to the amount of leverage that you have. So if you have 5% debt and then you say no, I want 10% debt, your cost of debt is typically not going to change or not perceptibly so. But yet in the formulas presumably we've assumed something fairly linear in terms of what happens to debt.

Now whether at what point the cost of debt starts actually increasing, you would assume that that's a function of default risk primarily, and with regulated companies like this where do debt markets start worrying about the cost of debt? I don't know where that is, I'd be pretty confident it's not at 10%, maybe it's at 30%, I don't know, 40% where it is. But until you get there your cost of debt's pretty flat, and you're going to get something of a U shape.

So I don't think it's quite right to say that a Brennan-Lally view of the world means that these lines should all be flat.

MR DUIGNAN: Thanks, it's a good reminder that they definitely do tilt up, both of them, both the green line and the blue line obviously rise sharply if you get well up. Okay, we'll move on please.

MR CARVELL: I'd just like to agree with the comments that Paul made in respect of the market constraints on leverage. Whilst Vector would be supportive of a benchmark leverage based around a credit rating which I think does do something to mitigate some of the incentive concerns that the Commission are concerned about, there are practically a number of constraints.

So Vector as a listed and rated entity has a leverage which is somewhere just

below 60 and I think consistently in our submissions we've argued that from a modelling point of view in the CAPM for regulation purposes, the Commission should use a leverage of 60, not because we see that as a mechanism of driving up the return specifically, because intuitively our view is that across this range at least we should see only modest changes to cost of capital as a result of leverage; but because it reflects our real world experience of financing our business in that rated and listed environment.

One place where this does come home to roost for us, though, is when we then turn our attention to issues like debt margin, when we're talking about funding a book of a certain size, so the higher that leverage rate is, or perhaps to put that another way, the closer it is to our real leverage the more comfortable we feel that the conversation will then be around funding the debt book with recognition of appropriate tenors of debt, sources of debt to providers, instruments we may use and indeed countries we may source that from.

And for an organisation the size of Vector we are constrained in terms of borrowing from individual providers and indeed even within New Zealand, so often forced to go off-shore. And those things we would feel don't get adequately picked up in the debt margin discussion. So that's much more about why our focus on leverage is that it should be nearer the 60 than the 40.

But I think at the end of the day from a pragmatic point of view we'd be comfortable with a range as the Commission have proposed in their straw person which is built around an appropriate risk-free rate - sorry, credit rating.

MR DUIGNAN: Thanks it clearly will be quite important in your cross-submissions to make it clear that whatever levels you want or other matters that are introduced that the issue of acceptance of a benchmark proposal is kind of important that we know where we stand on that, because it has been aired here with two alternative views and so we'd ask if we could get a view on that. Thank you, if I move on.

MR HOOGLAND: I'd just like to reiterate a couple of previous points that, you know, there are a lot of real world constraints that prevent companies from sort of moving too far to either extreme of the range of leverages. And, you know, obviously particularly at the high end of leverage things like credit ratings start to come in to play. I almost have a question in regard to the sort of debt premium, because again sort of all else being equal leverage is one of the components that rating agencies use to evaluate credit ratings and obviously the credit ratings then flow through to different debt premiums. So I would be surprised

if an organisation that had a leverage of either 20% or 70% would have the same credit rating, so therefore the debt premium would be different, which will probably change the slope of those lines.

One other point to make, and I think it's been made earlier, is that given that CAPM is a guide to the Commission for setting a return for a regulatory period, logically the leverage should be a forward-looking assessment that takes into account the capital expenditure profile and so on of the business during the regulatory period.

MR DUIGNAN: Thank you.

MR BEST: Firstly I fully agree with Paul Goodeve in terms of the pragmatic constraints in terms of how much leverage a firm would seek to take on board. Second point is it certainly doesn't disturb me to see an upward sloping cost of capital curve, particularly with the higher levels of leverage. I guess Commissioner Duignan when we were at Telecom together many years ago I seem to recall the cost of capital curve at that stage was a U shape and the whole idea was to actually position the leverage at the bottom of the U.

And so as an extension of that, again I don't think there will be a problem in terms of a perverse incentive to try to drive businesses towards an exceptionally higher leverage, because the reality is if you're trying to get rich quick the idea is to get the Commission to agree to a higher WACC but then position your business at the bottom of that U. So on one hand you're actually receiving the higher return but actually paying the bottom. So it's not in the interests of the firm to actually drive their own leverage up.

The whole issue of leverage as a whole I see as being a - very much there's policy elements in here, some very broad policy elements; they include the debt premium, leverage, and, you know, for instance in the past the Commission has populated its costs of capital models using market data, and that market data has tended to be Vector and Powerco because they're the ones that have the bonds listed on the market. The market premium has been, or the debt premium has been identified in terms of how those bonds have been trading in secondary markets. And okay, on one hand that's, I guess, good for Powerco, Vector because it's likely to be quite representative of their particular businesses, not necessarily for other businesses, the smaller lines businesses, for example, who may struggle to achieve such debt premium or leverage levels themselves.

But then on the other hand I think it's also fair to say that Vector fails to see how those market trading premium are actually representative of the issuing level of debt, and

that's always been a concern that on one hand whenever you go out to the market to issue the costs can be far higher than the levels that are represented in terms of the Commission's models.

So the policy issue here is that if setting industry standard levels which are either optimal or efficient, or deemed to be efficient but potentially they're hard on some of the smaller businesses, the question is whether that's a, you know, that's to be a deliberate policy to help try to pick up the industry or force amalgamations or something like that. If that's not the case then I guess the only option to the Commission is to go for firm-specific levels, as that doesn't put the same pressure on some of the smaller participants.

MR DUIGNAN: Thank you. Interesting, we'll take the various points you've made on board when we consider it and look to the submission, or any further submission.

MR ROBERTSON: Looking at the straw man it's a bit difficult for airports to get a feel for some of the thinking in some instances because the data is on lines companies and the specified airports being quite a small sample size with three that you're looking at is not good enough to get a total wide industry view in New Zealand.

In terms of looking at the history as well of leverage that can be a bit deceptive especially on the small sample size as I said. If we look back over Auckland Airport's last five years there's been five different credit ratings during that period from A plus to A to A minus, and if that's not thought of when you consider the leverage, the different leverage factors and you assume our current credit rating then you'll be misinformed.

The other aspect is there appears to be a strong link between leverage credit rating and debt premiums that you've implied. But in looking back in history over five years that's not how credit ratings performed, they are forward-looking, so they're looking at your future capex and your future debt needs not your past five years.

The other aspect that credit agencies look at in linking leverage to what will be your total debt costs, it's not just leverage is the driver, in fact they're looking at a whole lot of other factors about the business, the strength of the business, the size of the business and all those factors get taken into account when you end up with a credit rating, not just leverage.

MR DUIGNAN: Thanks, if we can have your view and then I'd like to - we'll hear the view of Martin and Russell and if time permits anything else but we'll be finishing at 5, thank you.

MR BASHER: I'd just add two other comments, one is a key factor for the credit rating

agencies is also the ownership of the business, whether it's public or private ownership has quite a significant impact in terms of some of the businesses around here. Secondly, that understand your concern about the relationship here and the propensity to increase WACC. I would just say that the other factor to consider is also that incentive for investment and that if a nominal leverage is struck at an overly conservative level it may make it difficult or harder for airports to make those judgments about that next lump sum step of significant terminal or runway investment that will be stepped increase in leverage.

MR DUIGNAN: Thank you. Martin, if you -

DR LALLY: Thanks. The apparently perverse upward slope that appears in the line here referred to is a consequence of a debt premium. If we lived in a world with no debt premium the line would be perfectly flat and it would be perfectly flat because the model in question, this simplified Brennan-Lally, reflects tax neutrality between debt and equity when you consider both corporate and personal taxes. So you get this upward slope because there's a debt premium.

And the debt premiums that we're looking at today are markedly larger than they were two or three years ago, and consequently this looks like much more of an issue than it would have looked like a couple of years ago. So if debt premiums double, the upward slope and the line doubles, and if debt premiums triple the upward slope triples.

Some observers have noted that you clean out the problem if you properly recognise in your gearing your beta gearing formula a debt beta, and that's true only if the debt premium is purely a reward for systematic risk. If it is a reward for systematic risk and you properly allow for debt betas, then the line will remain flat. However, debt premiums exist for reasons other than systematic risk on debt, they exist because debt, corporate debt is less liquid than Government bonds and consequently that's part of the reason for your debt premium.

Now that's a real world fact, cost of equity a-la CAPM doesn't allow for those sort of liquidity effects. So if you allowed for those liquidity effects in the CAPM you would be at least partly addressing the problem. You're also left with the fact that the debt premium is partly compensation for expected default costs. And part of that is just a transfer between debt holders and equity holders. Equity holders can walk away, they have the option to default. Debt holders are left holding the baby, and consequently they need ex-ante protection through the cost of debt.

Now because that transfer between debt and equity holders is simply between the two parties, it shouldn't be affecting WACC, but it is affecting WACC because we're recognising the default premium that debt holders need but we're not making an adjustment in the cost of equity.

So the bottom line here is that part of the reason why that function is upward sloping is bogus, and partly it's real. So the truth is somewhere between the two extremes, and it's not clear to me which of those two extremes the truth is closer to. So Garth's proposal, Garth Ireland's proposal that you set the WACC at the unlevered cost of equity, that would be on the low side, a lower bound on the truth, and the model that's been used here would give you an upper bound. The truth is somewhere between the two.

So I think this is a judgment matter for Regulators for the Commission to make a calling on, whichever of the two extremes they settle on, it's either going to understate or it's going to overstate.

The last point to make is that clearly the upward slope is inconsistent with the fact that firms are by and large partly financed with debt. If this line was a reflection of the true situation then, as Garth has indicated, they'd all go for zero leverage. Unfortunately the model doesn't pick up all the effects, even allowing for the points that I've already mentioned, it doesn't pick up all the effects of debt. There's a lot of qualitative advantages that debt has which can't be incorporated in this model or indeed any other model. And those qualitative advantages tilt firms towards some level of debt, but this model doesn't pick it up.

So this is a bizarre situation, the Commission has got to make a calling on it that's going to lead to either an understatement or an overstatement.

MR DUIGNAN: Thanks very much. Russell - yeah, Russell if you can be quick and then John a very quick comment.

MR REDMAYNE: Can I just put a very quick question to Martin?

MR DUIGNAN: You can pose it but it might be answered perhaps tomorrow, but pose it.

MR REDMAYNE: Martin, you characterised the upper bound of the estimate being based on using the model I guess based on the point estimate. I would have thought that was a central estimate of the cost of capital given that the comparator company analysis provided the beta estimates and the debt premium estimates; perhaps something you want to reflect on.

DR LALLY: I can respond immediately if you want me to but I can see time is short.

MR DUIGNAN: Let's cover it tomorrow if you don't mind.

DR LALLY: Yeah, yeah.

MR DUIGNAN: Russell.

MR INGHAM: Okay, I'll just be very brief. I suppose really just picking up on some points that have already been made. In terms of leverage, in terms of the notional leverage, certainly from what I see companies like Vector and Powerco do physically have debt to equity ratios around the sort of 60% mark, I mean that's a fact of life, I'm sure they're not being irrational by doing that. So it seems to me that certainly in terms of setting a notional that would be the sort of area that you would go for, clearly subject to the qualification about saying well where do you expect them to be. I mean we are looking towards the future and of course what we're seeing at the moment is obviously where did it come from the past.

In terms of the issue of the line, I mean the loss has been set. I suppose really the question there is the discussion about where you set debt beta. Certainly from my observation the estimation of debt beta seems to be rather problematic in terms of actually discerning what the number should be on the basis that the debt premium isn't solely systematic risk, we do have these other factors. And certainly in terms of the CAPM itself I recognise that CAPM does have things that are outside it that clearly should be somehow captured, thinking of things like bankruptcy costs. So clearly they're relevant to the chart, not sure of an easy way to solve that problem however.

MR DUIGNAN: Right, so we don't have an easy way but we do look forward to submissions to assist us. With that I hand back to our Chair for any final comments.

CHAIR: That brings today's session to a close. Thank you for your participation today. We reconvene again tomorrow at 9 o'clock, at which point we'll go straight into the next session. So see you tomorrow.

Conference adjourns at 5.01 pm to

Friday 13 November 2009 at 9 am