COST OF CAPITAL WORKSHOP
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[8.56 am]

CHAIR: Okay, shall we make a start for today. Welcome back to the second of the two days of the input methodology workshop relating to cost of capital. The first session today will be chaired by Commissioner Mazzoleni on the cost of debt, but before we move to that we'd like to make just two very brief statements, one I'll make on legal issues and then Commissioner Duignan will follow-up.

We thought it would be helpful to remind everybody of the actual legislative test that is under consideration here and to bear that in mind today as submissions are made. And under the legislation we have to formulate each of these input methodologies, including that as for WACC, to set out matters in sufficient detail so that each effective supplier is reasonably able to estimate the material effects of the methodology.

So we are being put in a position of having to give specificity to some significant degree it seems in relation to each input methodology, and so to us wide-ranging submissions about ranges and uncertainty and so on, that may be the inherent nature of the subject matter here, I accept that, but at the end of the day the legislative task that we are required to perform means that we will have to specify an input methodology for WACC that doesn't have those kind of characteristics. We have to put out something that has some degree of specificity such that each of you will know how it affects your organisation.

So if you could just bear that in mind when you are making submissions. The more you can give us guidance as to exact points and so on will be certainly of material assistance to us. I'll ask Commissioner Duignan to follow-up with some wider guide lines as well.

MR DUIGNAN: Thank you. I think it would be useful just to briefly mention that under the Commerce Act as amended last year under Part 4, the input methodologies section, it is effectively mandated that the form of regulation that we will be implementing is CPI-X regulation. The role of the WACC under that is to be applied effectively to the regulated asset base to translate into a notional revenue path corresponding to the CPI-X and one of the implications of that is that we are setting a path for effectively some five years under what is described as the default price quality path.

And so the points that were urged yesterday by some of the interventions that companies be allowed to retain efficiency gains is definitely built into the framework of the regulation, and that in thinking about what we are covering at this workshop I think it is worthwhile for particularly those experts who have focused specifically on the WACC to be aware of that wider framework. That is quite specifically mandated by the Commerce Amendment Act in I think what is described as subpart 6 of Part 4. So I thought it would be useful just to make sure that we all had that framework in mind. Thank you.

COST OF DEBT

MS MAZZOLENI: This morning's session right through until lunch is in relation to the cost of debt and we have four subjects to cover so we'll try and cover the term of the risk-free rate and estimating the risk-free rate before morning tea with a start on the premium, and then focus on the premium after morning tea, and Commissioner Duignan will cover the financeability section before lunch.

If I could just run through a scenario so that we're all talking about the same type of business or where we're not we can pull out the differences. If we can all assume we are referencing a utility business which has long lived assets and the revenues are regular and the prices are reset every five years. It has normal policies to manage interest rate risk and refinancing risk so it has a spread of borrowings from the short to the long end and it has interest hedges in place and perhaps it has FX hedges in place where it has borrowed off-shore. It has regular capex so it's refinancings are relatively non-lumpy.

So if EDB and all experts confine their answers to that scenario and I guess when we go around airports and telcos and MDL do the same but note where the differences are, for example the lumpy capex. The first topic we're going to cover is the term of the

risk-free rate. Sorry, I should also add that the other two things that we'll cover off this morning are in relation to the straw man, the risk-free calculation that's set out on page 3 and also after the morning tea the debt premium calculation that's set out on page 9.

But firstly in relation to the term of the risk-free rate, the Commission's preliminary view for estimating the risk-free rate in both the cost of debt and the cost of equity is to match the term of the risk-free rate to the length of the regulatory period. This is consistent with advice by Professor Myers and Professor Franks, although there was some debate obviously in the expert panel recommendations about the term of the regulatory period. For us that's more certain.

Parties have indicated that firms generally try to match the financing of their assets with expected lifetime of these assets, hence in the case of long life network assets parties have argued for a period for the risk-free rate with the longest maturity available in New Zealand, that is ten years which is obviously longer than the proposed regulatory period. In relation to debt this suggestion appears to ignore other considerations that affect the average maturity profile of firms' debt, including management of interest rate risk and refinancing risk.

I'd just like to start off with a question for company representatives. If the Commission was to adopt a ten year term for the risk-free rate and the yield curve is inverse, say there is a 2% slope between zero to ten years roughly and negative 1% slope between five and ten years; are companies comfortable with using the longest period, that is ten years? As a regulator I express some discomfort doing that given that the regulated supplier will be under-compensated by 100 basis points on its cost of debt.

This is not a theoretical example as our expert panel noted. The New Zealand yield curve has sloped downwards quite sharply repeatedly in the last several years. So for parties I appreciate some parties suggested a ten year rate, other parties suggested a ten year rate swapped back to five years. On the assumption it is a ten year rate, are parties still comfortable with the longest rate where the yield curve is inverse? Who would like to start?

MR NORRIS: Richard Norris from Transpower. We have exactly that. And yes, I would be comfortable with that. We separate our debt management from our interest rate management, so we'd be working with that, so we would be happy to live with that.

MS MAZZOLENI: That would mean that your transfer costs would be set - you'd set your term but you'd also be setting your interest cost at that lowest point on the interest curve.

MR NORRIS: And we'd be managing around that.

MS MAZZOLENI: We'll pick that up when we come to looking at the difference between notional and actual.

CHAIR: I've just realised I've omitted to do something, and that is to get everybody to identify themselves for the record which will also help our stenographer. Apologies, if we could quickly go around the table.

MR FORD: Sean Ford from Air New Zealand.

DR LAYTON: Brent Layton from the New Zealand Institute of Economic Research.

MS COOPER: Kristina Cooper, Board of Airline Representatives, BARNZ.

MR HOOGLAND: Peter Hoogland from Castalia representing Transpower.

MR IRELAND: Garth Ireland, Ireland Wallace for MEUG.

MR SHEPHERD: Stuart Shepherd, LECG, for ENA.

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

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

DR MARSDEN: Alistair Marsden from University of Auckland for Airport Association and Auckland Airport.

MR ROBERTSON: Simon Robertson, Auckland Airport.

MR COCHRANE: Neil Cochrane, Christchurch Airport.

MR BALCHIN: Jeff Balchin, PricewaterhouseCoopers here with Christchurch Airport and Powerco.

MR GOODEVE: Paul Goodeve here with Powerco.

MR NORRIS: Richard Norris, Transpower.

MR REDMAYNE: John Redmayne, PricewaterhouseCoopers here with Telecom and a grouping of electricity distribution businesses.

MR SRZICH: Anthony Srzich with Telecom.

MR BEST: Peter Best, Saha International, for AECT.

MR MORGAN: Greg Morgan for Unison Networks.

MR SHELLEY: Andrew Shelley, CRA International here for Unison Networks.

PROF BOWMAN: Jerry Bowman here for Vector and Unison.

MR CARVELL: Alan Carvell, Vector.

MR BUZZARD: Greg Buzzard, PowerNet for ENA.

MR GRAY: Don Gray for Maui Development Limited.

MR NEWTON: Troy Newton, KPMG, with MDL.

MR INGHAM: Russell Ingham assisting the Commission.

DR LALLY: Martin Lally assisting the Commission.

CHAIR: Thank you.

MS MAZZOLENI: Okay, perhaps if we can start with Don Gray.

MR GRAY: Yes, the question seems to us to be that we've been setting our tariffs on the basis of quite short rates because our tariff has been reset every year and we're well aware of the fluctuations that occur there. So from our point of view a longer term rate is preferable. The question whether it should be the five year or ten year rate I think depends a little bit on liquidity.

MR CARVELL: Well, I think we would be probably as happy with the scenario as outlined I guess as we would with more traditional, or unhappy perhaps, as with the more traditional yield curve where a lot of our debt is out beyond five years, but the five year rate would be less than our debt term.

MR MORGAN: I guess the issue for us is that we have not been able to borrow long-term beyond five years and more recently three years. So in theory we'd be happy with a ten year rate if that was consistent with our ability to also borrow long-term, yeah. And also I guess the other thing is then the debt premium is also consistent with that term that we are able to borrow.

MS MAZZOLENI: We're just dealing with the risk-free rate at the moment, we'll pick up the term of the premium after morning tea.

MR BEST: The Trust has the same view as Vector.

MR GOODEVE: I know you're going to deal with debt risk premium later but I think there is a relationship there and they need to be dealt with together. So where you go out for that longer term and you get an inverse yield curve, I think the debt risk premium will reflect that difference. So at this stage our preference is for a longer term.

MR COCHRANE: We would support that as well in terms of looking at a ten year rate. You'd also need to look at the, as Paul has said, consider the debt premium when you're considering that question.

MR ROBERTSON: When I consider our last debt issues over the last few years, five years has been the minimum issue that we've issued into the market with ten years being the maximum, but we've also issued for eight and seven. So five years is actually the minimum level that we've issued when we've issued into bonds. Recently bank issuance is a lot harder because of the global liquidity crisis to get anything past three years. But

we're happy with a longer term risk-free rate consistent with our long-term goal for longer term debt.

MR BASHER: The issues for Wellington Airport are the same for the other two airports, it's longer term funding if it's available at a reasonable cost.

MS MAZZOLENI: I'd just like to turn now to, as I said before, in the submissions some of the parties suggested using the ten year rate, other parties suggested using the ten year rate and swapping that back into the five year risk-free rate to match the five year regulatory period. If the latter approach is taken, I don't quite understand how this is different to a five year term for the risk-free rate apart from the transaction costs associated with the swaps.

So could parties point that out, and also how would the Commission verify those hedging costs? I mean what information would be provided, as it's extremely difficult for the Commission to assess hedging costs independently without a transaction. And I'll address the question again to the company representatives, so perhaps we could go this way, my left.

MR BASHER: From the Wellington debt funding perspective the, I guess, management of the debt is done independently of the regulatory period, it's more about availability of debt. The cost of that debt provides an expected interest rate, stability over the longer term for the company. So to the extent that that can align with the regulatory period it's a useful benefit but it's not a priority in debt management.

MS MAZZOLENI: I think the question was if for regulatory purposes you're taking a risk-free rate of ten years and as some parties, quite a few parties, I think, suggested, you would swap that back to five years if five years was your regulatory period. How does that differ from taking just a five year rate for the regulatory period other than your hedging costs? And the second part is how is the Commission going to verify the hedging costs?

MR BASHER: I mean I'd have to think that through in relationship to the regulatory period for Wellington Airport. The costs aren't tied into that period, I never thought that through.

MR ROBERTSON: We didn't submit on that basis so I'll leave that to parties that did.

MR COCHRANE: Similarly we did not submit on that basis so I'll pass.

MR GOODEVE: [Waves hands in deference].

MR NORRIS: Same.

MR MORGAN: Same except that when we transact swaps or hedges we don't have any regard to the regulatory period, we tend to manage.

MS MAZZOLENI: But it's just a five year swap, it's just taking ten years and swapping for five, it's just a theoretical - that's theoretically or notionally exactly what we would be doing. So I guess a key issue for the Commission is if as parties have suggested you have a risk-free rate of ten years, if we are deciding to use a regulatory rate of five years, you can either price five year money, or as some parties, I can't recall, it might have been - I can't recall who it was.

MR MORGAN: We'll come back to you on that I think.

MS MAZZOLENI: But it's just basically a theoretical calculation, you're taking ten year money and swapping it back to five and you've said to us you need to have your hedge costs in that; there's two parts to that. It seems to me that that's exactly the same as pricing five year money and how is the Commission to verify hedge costs.

MR MORGAN: I'd like to give that some more thought and come back.

MR CARVELL: I think Vector would take the same response, we'll have to take that under consideration and come back.

MR GRAY: I'm afraid the same for us as well.

MS MAZZOLENI: Okay, I'm going to try this again. How would the Commission assess hedge costs? What information would parties provide? It's extremely difficult for the Commission to verify hedge costs, so what information would parties be prepared to provide?

MR CARVELL: I mean in terms of cost of debt risk-free rate and the like, the hedge costs are going to be dependent on the profile of debt, it's going to sit very much I think around how that profile might sit over time. If we're saying the debt is ten years, then I guess the price to set that back would be observable in the market. But I would certainly have to go back, as I said before, and just think that through in terms of whether you get a materially different outcome than simply the five year price.

MS MAZZOLENI: So from the sounds of it it seems what you're saying is it's going to be as difficult for you to assess the hedge costs for the sort of notional calculation as it would be for us. We would be doing the same thing, attempting to verify that with banks.

MR CARVELL: Speaking for myself I guess we don't have a Treasury expert from Vector here, so I'm just not in a good position to answer that question.

MS MAZZOLENI: If I could just open up a question to companies and experts. Using the scenario that we talked about, so the utility firm with the five year price resets, in estimating the cost of capital what term for the risk-free rates would parties use for that,

or, particularly for experts, advise your parties to use for that. Maybe I could start with John Redmayne.

MR REDMAYNE: First of all I'd just like to make a comment about liquidity for the benchmark risk-free rate. In New Zealand we don't tend to have much trading in long-term bonds, so -

MS MAZZOLENI: John, we're going to come on to that next, if you can raise that at that point that would be good.

MR REDMAYNE: For five years I would advocate a long-term rate and if there was liquidity I would say ten year rate, if there's not liquidity I would say a five to seven year rate.

MS MAZZOLENI: So a seven year rate in that scenario where you'd have five year resets.

MR REDMAYNE: Yes.

MS MAZZOLENI: Why would you go longer for the reset period for that?

MR REDMAYNE: Because I don't agree with the proposition that the risk-free rate should match the regulatory period. I think that investing in long-term assets there's a term premium in the risk-free rate structure and I think that term premium should be earned on investment in long-term assets.

MS MAZZOLENI: Thank you. Antony, we'll head down that way.

MR SRZICH: I suppose there are two things to say. I agree with John in terms of we would go for a term that matches the life of the asset but there's also a more general point that needs to be made here and the distinction between the input methodologies as it applies to electricity lines businesses and telecommunications. And that is my understanding, and you can correct me if I'm wrong, of the way that regulated cashflows will be calculated within the context of electricity lines businesses will be a building blocks approach, so this is where the cashflows for the next regulatory period is determined at the start of the period. So I fully understand how that can lead to a conclusion that the risk-free rate should line up with the term of the regulatory period.

The issue in telecommunications and the regulation around telecommunications is that regulated cashflows there are mostly determined using a tilted annuity formulation and if you take that approach then what that means is that the rate at which you discount those cashflows back to the present value has to be the same across the entire expected economic life of the asset, it doesn't line up with the regulatory period.

So analytically that leads you to a conclusion that, you know, this approach of matching the risk-free rate to the term of the regulatory period doesn't work. So I just

wanted to raise that at this point so when thinking about the cost of capital guidelines that that, you know, I suppose I just wanted to avoid the idea that the term of the risk-free rate should be locked into the regulatory period.

MS MAZZOLENI: And you would be saying that based on what you've just described that you would be going to the long end as far as you could in New Zealand.

MR SRZICH: Well no, this is just purely an analytical point, the derivation of the tilted annuity formula is based on taking a geometric sum of all future cashflows. In order to do that you need to have the same discount rate applying over the entire life of the expected economic life of the asset. If you try and chop and change that within the formulation then it just breaks down, the tilted annuity formulation doesn't work. So it's just purely an analytical point here.

MS MAZZOLENI: Thank you.

MR BEST: I guess the principle that underlies this is to try to reduce the risk of - risk in relation to interest rates, discount rates and so on. I agree with the previous comments in the sense that to immunise against the interest rate risk really needs to take into account not the actual life of the assets but the duration of the cashflow of those assets. This does tend to suggest a longer interest rate such as a ten year rate rather than a five year rate is more appropriate, but it's impossible to be specific to a particular - sorry, that's being general and every business is different.

MS MAZZOLENI: But in the scenario that we talked about where you've got this utility business with long life assets but five year price resets.

MR BEST: But again it's not the life of those assets it's the actual duration of the cashflow in relation to those assets which changes with growth in terms of a throughput growth and various factors. So you could invest in an asset and have a totally, you know, one business could have a totally different cashflow profile from another, even though the assets are very similar.

And so I guess my general thought is that a longer term interest rate is more applicable because I guess the longer the life of those assets the longer the duration of the cashflows is likely to be, but I don't think you can actually try to immunise interest rate risk with a general this is the right period to go for. It will differ from one company to another.

MR SHELLEY: The first point that I would make is that to me the risk-free rate for the cost of equity and the cost of debt are separable, there's no necessary reason for the two to be the

same. We're talking here about the cost of debt so I'll focus on that one. The example talks about prices that are reset every -

MS MAZZOLENI: Sorry, here we are talking about the risk-free rate, so you can tease that out.

MR SHELLEY: Okay.

MS MAZZOLENI: I mean it's basically around what you would advise your clients to use in the same scenario.

MR SHELLEY: Right, well, if I was advising on something other than a straight regulatory WACC to match what the regulator was saying then I would not necessarily keep the same risk-free rate for the cost of equity and the cost of debt. For the cost of debt the example is talking about price being reset every five years, which suggests almost a building block model, but I don't think that actually applies to almost anybody around the table here, although the DPP will be reset every five years, I think a reasonable expectation is that most EDBs will have a price path that might change tilt every five years but will be a long way from being set on a building block basis.

So at that point you are getting back into the same issue that you have for a firm in general where you are looking at duration matching in order to immunise against changes in interest rates. And on that basis a calculation based on a utility with 50 year assets being depreciated over time, a 2% annual revaluation rate in those assets counted as income, and ongoing asset replacement, you end up with a duration that is in the order of 8 and a half to 13 and a half years, depending on the actual discount rate applied. And that's even applying a building block model to that. But if you're smoothing things out the duration extends slightly further.

MS MAZZOLENI: So for the risk-free rate in the cost of equity, which we'll pick up this afternoon, you'd use one rate. In the cost of debt you're sort of indicating that you would use like a weighted average maturity profile across EDB businesses.

MR SHELLEY: No. The weighted average across EDB businesses will reflect some suboptimal debt policy. Theoretically, though, I would go for a ten year risk-free rate for EDBs, but I think you then have to look at what's actually available and their real cost of debt that they face, the marginal cost of debt that they can actually raise sometimes will reflect the ten year profile, sometimes will reflect a shorter available maturity.

And so it does become not necessarily firm specific but type of firm specific, there'll be a lot of small firms who ultimately can only raise funds over a short-term and so that's the sort of rate that I would reflect. But where a firm was able to raise debt

optimally then I'd be looking at a ten year risk-free rate.

MS MAZZOLENI: So it's still a forward-looking average maturity profile but you've broken it down -

MR SHELLEY: Yes.

MS MAZZOLENI: Into where different firms can raise different tenors?

MR SHELLEY: Yes.

MS MAZZOLENI: Okay, thank you.

PROF BOWMAN: In terms of advising the first thing I'd look at would be what the practise is independent of advice and then try to determine whether in financial economics that's sensible. And in my experience practise is financing long-term and that's consistent with standard financial economics advice in terms of matching maturities on the asset and liability side.

As Andrew said, if you think of it in terms of duration which is appropriate rather than 50 year life, duration on the asset side is probably ten years plus, duration on the debt side just kind of crudely is about half of the financing period, but of course in New Zealand we're quite limited in what's available with ten year life being close to the maximum.

So if we set that issue aside because there's issues in terms of what's available in New Zealand and what's available to different types of utilities, particularly size, which markets they can access. But if we set that aside I would advise long-term financing, I think the standard practise is appropriate practise.

I think then the question evolves given the position of the Commission is well if the Commission comes along and says that they're going to price based on a method of managing your debt that's not consistent with what you do, should you change your practise or not? Should you then try to protect yourself against this imposition of the Commission or are you going to continue on your way doing what you consider to be prudent management on your debt. And I don't think that's a question I can advise on, I think that's a question that the firms have to deal with.

So I feel that I would not advise that a firm change its debt maturities to five years because that's the Commission's position, I would not advise that. I think I would tell them that your position is finance long-term and then whether you engage in market transactions to try to protect yourself against the Commission's position is something that they're going to have to make a commercial decision on that.

MS MAZZOLENI: But a regulator could put a notional hedge back to five years for the regulatory period for the cost of debt.

PROF BOWMAN: It's not clear to me why the Commission ignores what's standard commercial practise, though, I mean it seems to me you're sort of trying to impose something that isn't consistent with commercial practise and then suggest that they put in place some additional transaction to try to protect themselves against this. But I think that's a commercial decision not a decision for a financial economics expert to make.

I think if I can another issue related to this, though, that I don't think should get lost in the shuffle is that the debt markets in New Zealand are quite incomplete, even for the very large companies, but certainly for the small companies, and you've got a big range of what is practically feasible for the different utilities. Some of them are in positions where they can go off-shore, some of them aren't. Some of them, as has been said, are looking at maturities as a practical matter now of about three years, that's all they can access, and I would argue that what they should be looking for is long-term financing.

If the market imposes on them short-term financing because that's all available, then the incompleteness of the market is imposing refinancing risk on the utilities, not that they want it, but it's imposed on them by the lack of completeness in the markets. And that's a hidden cost to those people, and I think there's a - I'm not going to go any further than that, but I think there are a lot of issues around this that vary considerably depending on the size of the utility.

MS MAZZOLENI: I mean I will move on but I just make the observation that, you know, I understand the comments, but it's somewhat at odds with the recommendations of the panel which they were diverse, the same risk-free rate, well Professor Franks and Professor Myers, same risk-free rate in both the cost of equity and cost of debt, and also in terms of the term.

I guess the three panel members certainly put the term in terms of cost of debt set at the regulatory period, although none of them agreed what the regulatory period would be, we had different forecasts of a range between three and five years. Anyway I'll move on and allow Alan to -

MR CARVELL: I guess I'll just concur with the sort of first point that Jerry made in particular, and the point that John Redmayne made around the way firms actually manage their debt portfolio to manage their repricing and the liquidity risks in a Treasury sense I think is of significance here, and I guess I'm just concerned at the concept that the regulatory overlay

should then price sort of the cost of that debt differently to that which the firms face when they prudently manage those risks.

MR BUZZARD: I think the key point for me is that we would like some consistency with the rates and there's a lot of variabilities in businesses, and this is just another one that if we can't get some longer term certainty or less fluctuation going on in the interest rates then it's just going to be too hard to manage the businesses. There's a number of variables in there already that are outside the company's control, one's inflation and how we measure it, another one's capital contributions.

This just appears to be another that's going to cause us problems and it doesn't leave us a heck of a lot left to manage our long-term businesses with if our prices are going to keep going up and down because the WACC goes up and down, and because interest rates are going up and down. And I think the Commission needs to find a tool that is going to give us a bit more certainty to match the longer term profile of our businesses.

As an example, just last month a company I work for, we got a five year swap starting in six months at 575. If I went and got that two days ago I would be paying 612, and, you know, it just makes you wonder at what point you put a stick in the sand, or how do you measure it. I think, you know, it just is very hard admittedly for the Commission, but I just don't think that you should look at something for a short-term when you're looking at long-term businesses, and we need a bit more consistency in terms of some of the numbers and what's going up and down, it makes life very awkward.

MS MAZZOLENI: Thank you. Certainly we'll tease out that discussion when we get to debt premia in terms of looking at actual compared to a Regulator's notional.

MR NEWTON: Yes, I think just listening to the people who are in corporates here it's quite clear they have a strong message for you I think on that issue so I won't revisit that. From a practitioner's point of view and in the particular case of MDL the primary objective for MDL was to demonstrate transparency and so with the revenue period of one year we used a one year risk-free rate. Ordinarily, however, in the absence of the regulatory context we would be arguing our clients take a long dated view on risk-free, but of course there are some liquidity issues I think with the very long-term ten years. So typically our practise is to use the five year.

MS MAZZOLENI: Thank you.

DR LAYTON: I'd of course be advising clients or customers of these institutions, and

particularly in the airport context, and I'd be advising them to seek the Commission to set the WACC at the regulatory period. And the reason for that is it makes it easier to judge the NPV equals zero which is essentially what they're trying to do. One recognises the assets are longer term but if you set periods, each period so that you are trying to at least get the NPV equals zero you'll be able to have a purview.

And I'd remind the Commission that it's actually not the Commission alone that has to be able to form views, but the information disclosure is about interested persons who are a group who will include those who probably have never heard of a swap, never mind know how to find a price for one and so forth. So I would be supporting the Commission's view in terms of it.

I make another comment and that is that, you know, as an economist people are saying the optimal period is as long as our assets, but we don't have a market out there, leaves me with a little bit of curiousness. Because if there's really a strong demand out there why hasn't the supply come? People have money, other countries have developed it, so that that we actually have the longest period here about ten years may reflect something that's about our structure not only on the supply side but also on the demand side for debt.

And if you did borrow even at ten years and you did so in the environment in which you laid out, and that is of continuously funding, rechanging your investment, your average debt would be, if it was a smooth roughly five years, even if you went to the maximum end of the period. And if you were refinancing at six or seven years where it's much thicker then the average would be around three years.

So I think, yes, upward sloping yield curves give an attraction to institutions to go along in these arguments, they argue about stability. But I think it's also important that people be able to test whether they are in fact getting a reasonable return on their capital over the time of the period that they've got it invested, and that helps one if one has it set relative to the regulatory period.

MS MAZZOLENI: Thank you.

MR HOOGLAND: I think I'd just like to reinforce I think Jerry and John who basically are saying that prudent debt management processes of these companies involve trying to get debt with as long a maturity as possible bearing in mind the long life of the assets. And also getting a spread of maturities particularly, and I know it's not our example here, companies such as Transpower would have lumpy assets.

Now under that sort of scenario where you're looking at long-term debt, typically companies are managing interest rate exposure via swaps, and that's fine up to a point and, you know, in theory I think it's reasonable to assume that the interest rate swap gets you back to the five year rate, other than transaction costs. But what it leaves on the table is the term premium for the longer dated debt that the companies have.

And as has been I think Jerry's sort of point, what you're doing is you're saying to a company you're engaging in prudent debt management, you're being left with the cost of the term premium that a regulator isn't compensating for you. So you then have a choice, do you go to a suboptimal debt management strategy to match the regulatory process, or do you argue to a regulator that they should recognise that refinancing risk, market liquidity, different types of markets and these sort of issues are factors that aren't really accounted for in the CAPM framework. So they're another area where the framework is a guide, but there needs to be some judgment as to reflect commercial practise. Thank you.

MR IRELAND: I would support what Dr Layton had said about matching the regulatory contract period with risk-free. In general advisory work we would first of all reference five years but also look at ten years and normally there's not too much different for the purpose of general investment activity, so for that it's not necessarily a big issue. But matching I think is where we would be.

MS MAZZOLENI: Thank you.

PROF VAN ZIJL: I'd concur with the comments made by the one speaker back and also by Jerry. It seems to me to be a little odd that if observation is that firms feel that an optimal policy is one that has a term longer than five years I don't see much sense in a regulator trying to impose a different regime. Firms exist for longer than the regulatory period and it's not at all surprising that they should try to manage for longer than that period.

DR MARSDEN: I've previously taken the view that the term of the risk-free rate should match the regulatory period, but I've always felt that the arguments, and the question here is a very difficult question, particularly given the financial crisis which has really focused the risk upon refinancing and recontracting risk. And that is because companies, prudent companies will clearly want to try to borrow long-term debt to match long-term life of the assets, and to avoid recontracting risk they clearly will want to borrow terms of different maturity profiles than any sort of price reset date.

I note that Dr Lally has also written a couple of papers on this area which he's developed models, and I've got no sort of, I guess, theoretical model that would refute

what he argues, but he's written a recent paper in 2007 that says that if a regulator requires the risk-free rate to match the regulatory period, the firm should also match its duration of the debt to the regulatory period.

And if a firm doesn't do that I think the comment he makes is that it will tend to provide a net present value outcome that may be negative, and therefore I think this idea of hedging risk if we know that firms are going to borrow for periods that don't match a price review date, this concept or ability to be able to hedge interest rate risk, if that is the incentives then the Commission imposes by choosing or mandating the term of the risk-free rate to the price review period become very important.

And again you would need to confer to I think the industry here to more specific details, but my understanding is that when firms borrow long-term they go out into the bond market and most of that borrowing is raised by way of fixed rate debt, and it's not clear to me particularly in our markets how easy if I were to borrow, say, ten year fixed rate debt, how easy that would actually be in practise to swap back into five year fixed rate debt. Now that's a question that's probably better answered by a Treasury expert, but I would imagine that I'm just not sure whether that's practical or cost-effective.

So in that absence and I think also when most people adopt the CAPM in practise they use a long-term risk-free rate. So in overall I think that there are strong arguments to adopt a long-term risk-free rate that doesn't match the regulatory review period in the CAPM.

MS MAZZOLENI: Thank you.

MR ROBERTSON: In terms of what we do in terms of managing our Treasury risks, we certainly look when we need to issue at markets where we can issue long-term debt where we can at the best prices, and focus our delivery of the debt package to meet that particular market's needs. Most recently one of the few markets in the world that's been still active has been the New Zealand domestic retail bond market and that market demands fixed issuance debt.

Our issuance into that market has been for eight years, or five years and seven years in the last 12 months. The reason we do that of course is to lower our total overall cost of funds to have an appropriate spread of maturities, to manage our liquidity risk and our refinancing risk which are much more important than matching to a five year period. In terms of matching to a five year period I don't know any organisation that would have that as a goal, to match a regulatory issue I think we're much more concerned about

Treasury risk. So we, as I said, would go longer.

Where we do go shorter, though. And there are some markets that you can still access with shorter term debt, like bank, that doesn't stop you hedging that short-term floating rate exposure for longer term debt. In fact we do do that, so we might access a bank market for a shorter period of time but have the confidence that we'd be able to roll that bank debt at its maturity and hedge that for longer periods for five, seven or ten years.

One of the issues, though, that we have around hedging is current accounting standards. They stop you from putting a hedge on a hedge. So the scenario of issuing into a debt market of fixed issuance for long-term, swapping that back into floating rate debt and then in turn swapping that back to a five year exposure won't be able to be hedge accounted for accounting purposes and you'll have mark to market exposures running through your income statement.

MS MAZZOLENI: But that would be for regulatory counts only because it will only be a notional swap back for the five year period for regulatory purposes.

MR ROBERTSON: I'm actually explaining what we do, not the regulatory period. I think that was your question at the start which is what do companies do. That's what we do, we don't swap, we don't put a swap on a swap.

MS MAZZOLENI: And even if for regulatory purposes that was what was done in order to get a five year rate, you wouldn't be required to account for that in your stat accounts because it would only be for regulatory purposes, it's just a notional calculation to come up with the cost of capital, for regulatory purposes. I'll leave it at that.

MR NORRIS: We do exactly the same, we separate our funding risk from our interest rate risk. So when we raise long dated debt, which is a prudent thing to do, we'll swap that back to floating Kiwi bills, then we'll have a separate portfolio of interest rate swaps to manage the interest rate risk. But certainly from Transpower's perspective we prefer to and think it's appropriate to issue longer dated debt to separate that refinancing risk.

MS MAZZOLENI: Thank you.

MR COCHRANE: One point I would like to make, and it's been made several times, is that the level of financing is based not necessarily on the regulatory risk but on the terms of what your investment requirements is going to be. As I mentioned yesterday there is quite a peaky investment programme required by airports, so in putting your borrowing programmes into place you take a longer account of that programme rather than the regulatory period.

In addition I would like to add to what Simon is saying, the objective is to certainly look for long-term debt, but many companies in New Zealand don't have the access to that market and one of the markets that are currently available to some degree is the private placement in the US. But unfortunately a lot of New Zealand companies don't have the capacity or the level to be able to borrow into that market to access that level of duration.

So what we do, as with Auckland, is we look at a profile firstly for our liquidity in terms of refinancing and then we manage our interest rate profile quite separately, and they have a balanced profile across the periods.

MR BALCHIN: I agree with a number of views expressed earlier, so I'll just summarise my views on this matter. I think the considerations for equity and debt are different, and you can get different answers; you need not, so I'll just focus on my views on debt. I've advocated yesterday that I've advocated to Regulators and businesses in Australia that the cost of debt should be based on the benchmark consistent with benchmark financing assumption.

That benchmark should be based on observation of what firms in this particular situation actually do rather than the prediction of what firms should do. It's only really by observing what firms actually do that you can get a more accurate - a reliable guide on what is efficient behaviour. Models are always incomplete, and we know that particularly since the events of the last year that refinancing risk is a real risk and certainly a number of utilities in Australia found out just how real that risk was.

In Australia the AER has recently gone through an exercise where it - we'd had a practise of using ten year debt as the benchmark for cost of debt for the energy sector in Australia. The AER recently, as you know, has gone through quite a long exercise in renewing the standard WACC assumptions. And it confirmed the previous practise of ten years. That was based for the most part on an observation of what firms actually do with some rounding involved.

One of the findings they did make, there was quite a lot of information there about what firms in Australia do do, and I'd suggest you include them in your sample of the firms you look at if you're trying to see how terms should respond to this environment, because in Australia we've had this five year price reset regulation for a longer period, so there's a bit more information on how firms actually manage their Treasury practises in that environment.

There is a practise in Australia where firms often issue longer term debt that's either issued as floating or issued as fixed then swapped into floating, or issued in the US then swapped into Aussie then swapped into floating, and then swapped - then a number of firms have swaps to match the regulatory period.

What the AER accepted, though, is that even though you can swap back the underlying not risk-free but sort of bank bill swap rate component to be consistent with a five year term, if you issue longer term there's always a credit margin that you pay which is a longer term credit margin that you can never actually swap away. So if you issue longer term and swapping into short-term your cost of debt, all that cost of debt is always higher than if you issue for five year terms.

MS MAZZOLENI: I think we're going to pick that particular point up when we talk about premia, it's just the difference between perhaps having a five year base rate and a ten year margin.

MR BALCHIN: Okay, that's all I have to say.

MS MAZZOLENI: Thank you, I'll just finish this with Martin and Russell if I may. Sorry, did I miss anyone? No?

MR INGHAM: Certainly in terms of the question you posed regarding what I advise clients to do, certainly that has been the longer term, the ten year type rate. I suppose in the context of market as we see it at the moment, I mean clearly there are liquidity issues out of that term. Certainly in terms of the process of people borrowing for that period then swapping back, as Simon and others have described, certainly that is my observation of what actually happens in the corporate market, and certainly the point that's been touched on is about the credit margin that if you do issue for that longer period you still have that even if you swap away.

I suppose just in terms of the regulatory period in terms of this NPV equals zero, I suppose just my initial reaction, I haven't sort of studied it in detail or read the papers, but it just seems to me that I assumed that assumes away the issue of refinancing as a cost and therefore it doesn't feature. But certainly it seems to me that there is a cost, or an expected cost out there and that if that was taken into account then the answer may not be exactly. You may, for example, have to give what has been suggested, for example, the equivalent of the hedging cost, but also recognise there's that term premium.

MS MAZZOLENI: Martin?

DR LALLY: I'd like to pick up on a comment that's been made by a number of people here

relating to the imposition of the Commission on to the normal operations of an unregulated business. And for the purposes of these comments I'll take it as given that in the absence of regulation these businesses would indeed borrow for ten years, and then along comes the Regulator.

Now there's nothing about regulation which dictates what the regulatory period should be and the Commerce Commission is across a range of activities using regulatory periods from one to five years. If the Commerce Commission chose a regulatory period of ten years then everybody would be happy, the Commission would, following its preliminary view, of matching the term of debt to the regulatory period we'd be looking at a ten year risk-free rate, and everyone around this table would presumably be happy.

The problem arises because the Commission is using a regulatory period less than ten years, and the hypothetical case here is five. Now as I see it the purpose of this workshop is not to debate the merits of regulation, or indeed even to debate what the optimal regulatory period is. Of course someone somewhere has a debate about the optimal regulatory period, but for the purposes of this workshop we have to take the regulatory period as given. And following Anita's example, suppose it is five years, that does conflict what I'm hearing with the normal practise of businesses in the absence of regulation. So that's the source of the problem and we can't wish that away.

The fundamental question is, given a regulatory period of five years, should the Regulator every five years use a ten year risk-free rate or a five year risk-free rate? That's the question. And Alistair's referred to a paper of mine in 2007, I think I know the paper he's referring to, and it focuses on that very question. What if the regulatory period diverges from what firms would otherwise be doing?

And my analysis shows that if the Regulator every five years keeps using the ten year risk-free rate then the NPV equals zero proposition is violated. Whereas if the Regulator uses the five year risk-free rate every five years and firms align themselves with that, either by choosing a borrowing term of five years or sticking with their borrowing term of ten years coupled with swaps to effectively give them a five year roll over, then the NPV zero rule is satisfied.

So the challenge, I think, to people here is not simply to tell us that their practices are ten years or even that a regulatory period of five years is unhelpful to them, both of those things we might take as given. The challenge is, is this NPV zero rule important, and if it is important show us analytically how your proposal would satisfy an NPV

equals zero rule.

Now the only person here who's objected to the five year risk-free rate being reset every five years on the basis that it does violate that rule and claims to have analysis in support of that is Antony, and in respect of the very special case of tilted annuities. My reaction to that claim is that I'm surprised. I'd be very pleased to see Antony's analysis, and be very pleased to see analysis from other parties on this question. Is NPV equals zero an important rule to follow and if it is how does your proposal satisfy it? That I think is the interesting question.

On the second question of refinancing risk I think the proposition that in the presence of refinancing risk firms might want to borrow for ten years, that's fine, and therefore the swap costs to bring it back to five years need to be taken account of by the Regulator. I don't think that proposition is controversial, I think that's generally accepted. There has been, though, a comment on the practicality of doing that and the cost of doing so. I would defer to Russell on the practicality and cost of this, but my understanding is that neither of them is a significant issue in respect of interest rate risk. There's clearly an issue in respect of the debt premium.

MS MAZZOLENI: Thank you. I'd like to turn now to the next topic which is estimating the risk-free rate. Traditionally Regulators have used Government bond yields to estimate the risk-free rate. The Commission has proposed to follow this approach. Before the credit crunch most debt and hybrid equity issues were priced off swaps and swaps have been suggested as a proxy for the risk-free rate, especially as the liquidity of Government bonds had at that time all but dried up. Certainly during the early stages of the credit crunch it was also suggested that supra-national bonds could provide a better proxy for the risk-free rate than Government bonds.

So the question to everyone, and I'll probably start around this side of the room, is Professor Franks and Myers have suggested that only one risk-free rate be used for both the cost of equity and the cost of debt, but what proxy do parties use to estimate the risk-free rate? Do parties, for example, use one base rate for the cost of debt e.g. swaps in their cost of capital calculation and another for the cost of equity, for example Governments in the risk-free rate for the cost of equity and why would you do that? And whether, if you do do that, whether that would be an appropriate approach for regulatory purposes. Dr Layton, if you don't mind I might start with you.

DR LAYTON: One rate and I use yield to maturity on Government bonds and I'd remind you

you can get those off the Reserve Bank web page which is free, all other sources won't be available to interested persons who don't have a subscription to some other vendor.

MR HOOGLAND: Again I think for consistency one rate, even though I'd argue it be the ten year rate rather than the five year rate, and based on Government bonds is very standard practise.

MR IRELAND: I'd agree with Brent, page A2 on the Reserve Bank website provides all the information, over 20 years history.

PROF VAN ZIJL: Likewise I would agree with the use of the Government bond yield, subject to the fact that you do need to correct for semi-annual compounding. But the big plus I think associated with that is that the information is freely available and there's no proprietary tricks involved in the sense of black boxes between inputs and outputs, so that would certainly be my recommendation.

MS MAZZOLENI: Sorry, I'm happy to take comments from companies as well as we go around.

MR BASHER: We've used the Government bond rates for the last 10 or 15 years of pricing and there's no reason I think to change from that.

DR MARSDEN: Likewise I'd just use the Government bond yields, again subject to the correction that Tony noted, the semi-annual compounding.

MR ROBERTSON: Yeah, we use Government bond yields.

MR COCHRANE: Similarly we use Government bond yields.

MR BALCHIN: I agree with the issue of Government bond yields, although noting my comment earlier that I think the considerations for the cost of equity and debts are different. And also noting the comment I made yesterday about PwC's valuation practise, during the worst of the global financial crisis when it made an adjustment of the spot bond yields to take account of the rather unprecedented drop.

MR GOODEVE: Powerco uses the Government bond rates the same as everyone else, so far.

MR NORRIS: Ditto for Transpower.

MR REDMAYNE: Yes, we use and advise on use of Government bond yields. Although I'd note a lot of companies when you talk to their Treasury people they would use a swap rate as the basis for pricing debt or talking about debt pricing, but it's relatively straightforward to convert that into something above a bond yield.

MS MAZZOLENI: So the companies that you would advise would still use the Government bond on the debt side?

MR REDMAYNE: The Treasury people would typically use a swap rate as the base rate for all their reference points, I mean some of the company people might be able to elaborate on that here, but that's my experience.

MR SRZICH: In terms of cost of capital my recollection is that we use Government bond yields.

MR MORGAN: Yes, in terms of calculating the cost of capital we use Government bond yields.

MR SHELLEY: While the swap rate might be relevant it gets incorporated into the debt premium anyway, so just use the relevant Government bond yield.

PROF BOWMAN: Agree and agree with Tony about the semi-annual.

MR CARVELL: And indeed that's Vector's practise, we use the Government stock rate adjusted for the semi-annual compounding issue.

MR BUZZARD: Nothing further to add.

MR NEWTON: Same approach as has been described here.

MR INGHAM: Certainly Government bonds and semi-annual compound.

DR LALLY: Yes, likewise.

MR ROBERTSON: I'd just like to clarify one party talked about swap rates, Treasurers do tend to refer to swap rates when we talk about debt premiums, so we just have to make the appropriate adjustment between the risk-free rate and the amount to adjust the debt premium for that.

MS MAZZOLENI: I'm sure you'll correct me if I'm wrong but I think everyone agreed. **[Laughter]** Just have an eye on the straw man example on page 3, I know we've talked about some differences in terms of what the term is, but when estimating the risk-free rate of return do parties propose that the Commission should use an average or a point estimate, and over what period? In particular the Commission has proposed where the regulatory period is five years the five year Government bond calculated as an average of the calendar month preceding the regulatory period has been proposed in the straw man example. Is this sufficient to smooth out the volatility and if not how should this be done and over what period? Looks like Garth wants to kick off.

MR IRELAND: No, I'd say always use the month average before and the Reserve Bank web page does that - all the averaging for the prior month or whatever is on the Reserve Bank page, so it's very convenient to pick up one figure and trust their calculation. So you know, the source of error for that is eliminated.

MS MAZZOLENI: If we could whizz around parties, maybe we'll start with you, Troy. The question really is whether the month before is sufficient in this sort of environment to smooth out the volatility or as I guess we've seen some Regulators do take a wider range than that.

MR NEWTON: I've certainly seen a longer period than a month. In the particular instance of MDL we used a month average but that was quite a short-term revenue setting period.

MS MAZZOLENI: If anyone has a different view to what we've set out in the straw person of a month averaging beforehand, particularly given the volatility that we've experienced over the last few years, I just suggest you speak rather than -

DR LAYTON: One of the issues that arises for airports and airlines, of course, is that they go through a consultation process which will last quite a lengthy period of time. So the month before the setting of the date is actually not helpful for knowing what you're talking about when you're doing that consultation. But that's a particular issue.

PROF BOWMAN: One issue is the timing, the relationship between when decisions are made by companies and when the information is available about what the risk-free rate is. But my sense in reading the justification for the one month averaging period is to smooth out volatility, and I think that's even what you said. I don't agree with that, I think the whole idea of smoothing volatility is somewhat suspect, but even if it is I think quite a short period is appropriate.

I think you need to distinguish between volatility, where the mean isn't changing you just have period to period volatility and trends. And my concern is that as you get longer periods you're distorting, you're putting a trend basically back by perhaps something like half of the period that you choose to average over.

If you're concerned about volatility then first I'd suggest that you take a look at the data that everybody's referring to and give some assessment of what the risk of that volatility is, in my experience it's pretty small. That is in the sense that if you look at a particular day and you think about well, what sort of distortion would I get if I used that day because of volatility I think you're talking about a basis point or thereabouts. And the cost of averaging over a month to avoid what might or might not be a day volatility you are risking a distortion because of trends actually happening.

I think then you have to say yes, but what about a global financial crisis or what about a 9/11 or something like that, and I don't see any problem at all with the Commerce Commission saying we've got a problem and we're going to deal with it because now we

know there's a problem rather than assuming that there's some problem with volatility. And I think if there's a justification of volatility I just don't think washes and I think you run the risk of distorting when there's actually trends going on. So you're saying it's a date for 30 June but in fact because there's a trend going on and you're using a 30 day period you're really giving us a date for 15 May.

MR INGHAM: Can I just I suppose make a comment just on one aspect of what you said. That is just that recent yield volatility even at the long end, I mean even if you look, for example, at the US Treasury site you will see changes between their daily fixings for ten year bonds of 15, 20, even 25 basis points believe it or not, between one day and the next working day.

PROF BOWMAN: Yes, but that's -

MR INGHAM: They are that sort of magnitude.

PROF BOWMAN: Yes, but I said when you're in a period where volatility's clearly a problem on an inter-day basis then there's no reason why the Commission can't put in a proviso that it will insert itself into that situation when it exists.

MR INGHAM: And we've actually been in that sort of period for quite some period of time where we've had that sort of intraday volatility going on.

MR BALCHIN: I've just got a couple of quick comments. The idea of taking a short-term average 20 to 40 days is reasonably standard practise in Australia, we've been doing that for sometime. It's been relatively uncontroversial until this global financial crisis we've just been through. So I'd suggest to the extent you lock in this rule you give yourself a safety valve such as, you know, in case of global financial crisis break glass or something or other.

In terms of the actual averaging period I think in practise you wouldn't be using the month just before the regulatory period because you want to have your report out before the period to give them time to put the price into effect, and you'd want to have the averaging done in the time for you to have the numbers feed through your report, so it would probably be some months prior to that.

In Australia we don't actually lock in, we don't have a set time period when that generally occurs. For the energy sector at least there's the ability for the Regulator and the businesses to agree in advance, so well before the averaging period, about the actual period that's going to be used and that can then be locked in. That allows parties then to know when the period's going to be, so if they want to arrange inflation swaps and those

sorts of things for the regulatory period then they can actually - they actually know the period in time.

That averaging period is generally kept confidential as well until after the time that it's released so that if they're going to the market and trying to issue lots of inflation swaps at that point in time people don't see them coming. So yeah, that's the practise we have.

MR SHEPHERD: Another point in terms of choosing this window is the Commission does have an obligation to make its determinations in some instances like, for example, under DPP four months out. So I think that adds to the point that Jeff's just making, that in order for all this process to work this window would have to be some period well back from the month before the regulatory period begins.

MS MAZZOLENI: All right, so if there are no other comments on that before we turn to debt premia could I - sorry, Pat.

MR DUIGNAN: I just note that the earlier discussion was sort of ended up being totally couched in terms of the actual, how can I put it, interest rate fixed period and then this discussion is about the risk-free rate determination. The underlying proposition that I heard in the earlier submissions was to be looking to the actual structure of the exposure of companies, and at the risk of opening up a whole new issue, to say nothing of potentially a can of worms, I just would register that the logic of the earlier discussion if the Commission was to be of a mind to consider what was being argued, would be actually to consider the interest rate duration exposure of the companies going into the regulatory period, which logically would be a weighted average of when swaps have been put into place in practise in the past.

So I would just note that, you know, if one was really taking absolutely as advocated a basis of the kind of average interest rate exposure which companies would choose, then you would have to consider a much more longer term basis for setting the interest rate when you came to actually apply it. So there is just that in a sense if the submissions continued to argue for working off practise they would then need to be consistent to have at least a footnote which discussed what that would imply for the process of determining the applicable rate.

MS MAZZOLENI: We're not going to ask for comment on that now because that's pretty much the first of questions in the debt premium, so I think we could pick up -

MR DUIGNAN: Well, it does have an applicability to how you set the risk-free rate quite

independent of the premium.

MS MAZZOLENI: Okay, if we miss it there can you raise it again? Thank you.

PROF BOWMAN: Could I clarify my comment.

MS MAZZOLENI: Can we just - I'd like to finish the straw man before we head off into debt premium, thank you. Just in relation to the straw man example on the risk-free, apart from what we've discussed this morning are there any issues there that parties would like to raise where you would do that differently?

MR REDMAYNE: I guess in terms of the information that's in the straw person example, there's no underlying data, so we don't have the ability to really check calculations and things which would be nice once some real numbers come out.

MS MAZZOLENI: I think it was the intention based on your comment, the same comment yesterday, to put that data out again by Wednesday I think it is.

MR EILTS: I think we would like to comment on that after the morning break maybe, that would be good.

MS MAZZOLENI: Are there any other comments in terms of the straw man and how you would do anything differently to what is being proposed here? Apart from what we've obviously discussed this morning in terms of tenor.

MR BALCHIN: Could I just comment, what you're talking about here are converting into annualised yields and then interpolating between the rates, that's exactly the way we do it in Australia.

MS MAZZOLENI: All right, given it's 20 past we're going to break now and come back at 10 to 11, thank you.

Adjournment from 10.20 am to 10.49 am

CHAIR: Let's reconvene the next session of this workshop. Before we get back to the substantive matters I'll ask Enno to comment on the availability of the data which was a matter we undertook to get back on at the end of the morning tea break.

MR EILTS: Okay, thank you very much, we appreciate the need for transparency in this regard. The straw person outlines the methodology that we have applied, the straw person also outlines the data that we've used, or rather it cites the source which is Bloomberg. The data is subject to copyright, so we cannot make a unilateral decision of releasing all of that data. However, we are looking to explore this issue with Bloomberg and see what

data we can release and once we have resolved that we will get back to you as soon as we can.

MS MAZZOLENI: Okay, this session is right through until lunch time and we're covering off the debt premium now and Pat will pick up on financeability. In relation to the debt premium, obviously it's the margin between the corporate rate of borrowing and the riskless rate of interest. And the Commission's preliminary view is that the appropriate allowance for the debt premium will be the spread on traded corporate bonds with the same maturity as the regulatory period.

For EDBs the Commission has proposed that the debt premium will be measured as the average spread paid by firms issuing plain vanilla corporate debt with a maturity of five years at a rating of A minus or BBB plus SMP. In benchmarking the allowed cost of debt the Commission may draw upon evidence of the actual debt costs of the regulated businesses, provided that debt is within investment grade leverage.

Yesterday you indicated the real pressure point for you, or many of you indicated the real pressure point for you in the current financial markets is that your margins for borrowing have gone through the roof and the question, as Dr Lally suggested, is whether this is transitory, although we also noted that many of you were also filling up the long end of your books in the current climate.

The only way to avoid mismatches between the notional regulatory cost of debt and the actual changes in interest rates over the regulatory period and therefore remove potential under or over-compensation arising from this is to use the actual cost of debt. Some parties have suggested that actual debt costs should be used and have indicated that other Regulators may be considering this. This would imply that firms' actual weighted average debt costs are deducted from the risk-free rate. The difference would be used as the debt premium in the cost of capital estimation on a firm specific basis, in other words we can't just pick up your margins as the premia as they will be relative to different base rates than the RF that we will be using as some parties have pointed out this morning.

So the question, and I'd address this to the companies rather than the experts, is that given that there will be a component of floating rates in a firm's actual weighted average cost of debt, which will also include all hedged positions, logistically how do firms suggest that actual debt costs will be advised to the Commission for the regulatory period? For example, floating rates will alter the actual cost of debt on a 30 to 90 day basis, and similarly some firm's actual debt will roll off during the regulatory period and

may or may not be refreshed.

So given that one of the reasons for preferring a notional rather than actual cost of debt is to reduce the cost involved, for companies to answer, how would actual debt cost be provided in a simple timely and verifiable way to reduce the regulatory costs and delays. Which company would like to start with that?

MR GRAY: I think we will because we're not able to be very helpful **[laughter]** on this particular topic. I mean as everyone knows we don't handle debt directly on our balance sheet, it's handled by our joint venture owners. So in terms of providing information to the Commission we simply won't be able to.

MS MAZZOLENI: I think Alan just handed the microphone to Greg.

MR BUZZARD: I've actually got no particular comments on it either, my experience is dealing with banks and not with debt markets. So yeah, I think from our point of view we just look at the margins that we pay to the bank and that's our premia, so, yeah, it's not really appropriate for what you're looking at here.

MR CARVELL: I think our view is that we're not necessarily proponents of the Commission effectively repaying or rewarding our actual cost of debt per se, we talked yesterday about effectively a benchmark approach. Our concern is that in striking the debt premium in the way the Commission does it focuses on a single instrument. The reality is that Vector could not fund its book in the bond market, so that bond market margin that you observe is not necessarily indicative of our weighted average debt margin. And so we would be looking for an approach which took account of a wider range of instruments providers etc to arrive at a more representative debt margin.

MR MORGAN: I guess the first principle that I'm assuming is that rates should be forward-looking and not actual, and that that is important, because for us bank debt has been the main source of funding over recent times and over the next regulatory period we'll be facing different costs to what our actual costs are currently.

Having said that we recognise the pragmatism of using a benchmark rate and that I guess is consistent with using a benchmark notional leverage. However, we are concerned with the sort of single instrument approach taken in the straw person. We would rather the benchmark consider a sort of mix of funding sources such as bank debt and bonds, a range of tenors, and perhaps a range of providers.

I guess your question is how can that be provided to the Commission in an efficient way. I think I think a lot of that information around margins on bank debt and

bonds is sort of available in the market, and Treasury advisors should be able to give you a range of costs in the market. But we could perhaps give that some more thought in cross-submissions.

MS MAZZOLENI: I think the public issue information is very available to us, it's really you're talking about bank debt and it's that private information. I mean, you know, if we could get it from banks but it's very abstract compared to what we're talking about here, the actual costs that you would face.

MR MORGAN: And certainly we could, you know, the firms can provide - we've had recent pricing from banks, we can provide that information. And I guess the other issue is in the straw person, I'm not sure if this was part of the question, was around the use of credit ratings, and noting that the Commission has used would be to A minus. We would prefer a range of BBB to BBB plus as that's where we see most of the EDBs are sitting, and there's quite a margin difference between a BBB flat and an A minus.

And the last issue was in terms of issuance costs and establishment fees, and we believe that these should be viewed as part of the cost of debt which is consistent with commercial practise as opposed to in the cashflows, recognising that sort of mutually in a way, but from a practical perspective that's commercially how we view issues costs or establishment fees when you're talking about bank debt.

MS MAZZOLENI: Again would you mind addressing the information requirements that the Commission would need to assess those. Public issuance costs are very easy but it seems to me, particularly in the electricity area, there's a huge number of EDBs that don't go near the public markets. So bank issuance costs.

MR MORGAN: Yeah, recognise the issue. I guess as I said we'd probably want to give that some more thought, recognise the practical issues but ultimately, you know, we would prefer firm specific but recognise that if we can come up with an easy way of giving a mix of costs reflecting the sort of wide range of firms then we'll give that some thought.

MS MAZZOLENI: Could I just go back to Alan in terms of the other ranges or information you'd like to see in the straw person, because Greg's comments were quite useful.

MR CARVELL: We have had some work done for our internal purposes in terms of, for example, given our current make up of our debt book, what that would cost to raise today, well not today it was a few months ago, but at that point in time. And it seems to me that, you know, whilst that was, I guess, an investment bank advising us, there are, I guess, Treasury advisors in the market who would probably be more willing to do that on a more

general and open basis. And I think that may be a source, and in fact I think that was suggested yesterday by Andrew as an approach to the sort of debt issue question.

MS MAZZOLENI: And in terms of the other reference point that you wanted to see in the straw man rather than just the basis on which we'd calculated that example.

MR CARVELL: So in terms of different debt instruments for example?

MS MAZZOLENI: Mmm.

MR CARVELL: Well, I think from our point of view, you know, we do strike limitations in the New Zealand market in terms of the size of our debt book, so we are often required to go off-shore for debt. So with a much wider range of instruments and sources of debt we face a different array of costs. As I say, that comes out at a number which is not necessarily represented by the bond yield.

So understand the Commission's need for information around that, and I think there are issues in terms of, for example, on bank debt firms providing the Commission with information about bank debt and the Commission then converting that into some sort of decision, particularly if it's on a benchmark basis because that information is effectively confidential, commercially sensitive to the individual firms and the banks providing it.

So I think there needs to be a process which can filter that and it does seem to me that I think yesterday I think it was suggested that somewhere like Asia Pacific Risk Management, Bankcorp, those sorts of people might provide a facility that could effectively price up a notional debt book made up of a range of instruments rather than just that one instrument.

MS MAZZOLENI: Thank you.

MR BEST: I fully support the comments made by Alan and Greg. The Trust is not an issuer, but the Trust has, I guess, a very strong perception that actual issue costs for new debt are significantly above the trading margins for debt that the Commission has relied on in the past for setting the debt premium. And although I don't wish to speak for all the other line businesses I guess if those premium are based on some of the larger players such as Powerco and Vector I'd suggest they are quite out of line with some of the actual debt premiums for the smaller line businesses.

And I guess the final point is, well, I mean I do agree that perhaps the Commission could have some weighting in terms of advice from investment bankers as to what actual current issue premium are likely to be as opposed to where existing debt is

trading, and I think that is I guess more in line with the overall notion of the cost of capital being a forward-looking cost as opposed to trying to pick up what past debt or historical debt the actual debt on your book is trading at at the moment.

MR NORRIS: Over the next few years we'll be doubling our debt so we're very interested in the debt premium and we're very keen that the debt premium is focused forward-looking rather than historical looking. Also within that debt premium the costs of providing the capital market issuance and a stand by liquidity needs to be taken into account.

As far as visibility of the actual costs, of the existing debt for fair value accounting we add the credit margin to the existing debt, so that would be a visible way of looking at it there, but also most of our issuance is done in the capital markets which is easy to relay.

MS MAZZOLENI: Sorry, just that point about it's already highly visible, but that doesn't pick up your hedging position over the top of that, so you can't have any visibility on your overall forward-looking from.

MR NORRIS: Sorry, on the interest rate hedging position?

MS MAZZOLENI: No, on your total interest costs that you've locked in, obviously there's disclosure of, you know, within various categories over one to five years of what your borrowing is and your interest rate on that, but if you've got a hedge position over the top of that that changes your actual interest costs we don't have any visibility of that.

MR NORRIS: I suppose there is the visibility on a historical looking back basis when you look at the audited accounts which show the all up funding cost. We do that for - I suppose internally separate to the regulatory process we budget what our interest cost is going to be and that includes both the debt premium and a forecast interest cost which takes into account our portfolio of interest rate swaps plus capital market fees.

MS MAZZOLENI: But historical cost is of no use to us in terms of -

MR NORRIS: We do that on a forward-looking basis for our budgeting, our planning over a ten year horizon.

MS MAZZOLENI: And the Commission would get visibility of that how?

MR NORRIS: I suppose that has to be taken off-line but I'm sure Transpower would be happy to disclose that.

MS MAZZOLENI: Paul?

MR GOODEVE: We support the benchmark approach so I'm not going to be terribly helpful in how you could calculate the actual stuff. But I would like to reiterate the comments that Alan has made in that we've got quite a substantial capital expenditure programme going

forward, it's going to include debt streams that we probably don't access now, simply because the size of debt and the tenor that we're seeing is not available in New Zealand. So we would recommend a portfolio that looks forward at the debt that we're going to need over the next regulatory period.

MR COCHRANE: I'd like to raise one point at the beginning. We seem to be getting into a degree of specificity which I would question, is this required for information disclosure versus price control? And really looking at whether it is more appropriate to set a benchmark. Similarly I'd reinforce what has been made by a number of parties at present, is that we need to be forward-looking, particularly taking Christchurch. Our level of debt is probably going to grow by 2 or 300% to what it is now and similarly as a consequence as we go through the refinancing and taking on new debt some of the margins will go dramatically. We've just recently completed a five and seven year refinancing and the margin growth on that was approximately 700%.

So you've seen a significant step change in the market, both in terms of the type of product and the source of financing. Similarly as the Commissioner has said there are a number of points that would be required. What is the debt premium, what are your hedge costs, your arrangement fees, stand by and so on.

So my concern is that also as we made a point yesterday in terms of the NPV equals zero question, and companies retaining efficiency, I believe there should also be options for efficiency of financial management and therefore would support that the Commission consider a benchmark. That benchmark should not just consider a one point item, it should consider a range of products.

MR ROBERTSON: Like most of the other points made we would like the Commission to be looking forward rather than looking back and trying to estimate what is happening in the next few years by looking back, that doesn't necessarily work. But the only other point I would make is using quoted bond prices in the New Zealand market is prone to liquidity concerns, and the liquidity issue in the New Zealand market is there tends to be a lot more demand than supply, and actual issuance tends to be higher than what you typically see in the type, and you can see that in Auckland Airport's traded bonds and what we typically issue at tends to be higher.

MR BASHER: I'd just add one further point and that's when the Commission's looking at whether it's going to sustain a rating bottom line of BBB plus or A minus that does risk a disincentive to some of those companies that are already rated BBB plus whether there

are potential investment programmes going forward that they may have to borrow for; a consequence of the extra borrowing may be a reduction in rating and if they're not going to receive compensation for that borrowing through a regulatory rate there's a risk that they could be discouraged to some extent at least. So I'd encourage the Commission to think about perhaps a lower benchmark than the BBB plus.

MS MAZZOLENI: Okay.

MS COOPER: This has been an issue, the informational requirements that the Commission's mentioning is something that we've experienced during consultation with the airports and the practise which has arisen over the last few consultations has been for the airports to provide the airlines with a statement from their bankers estimating what the risk premium would be, which we've then been able to provide to our WACC advisor for comment.

MS MAZZOLENI: Thank you. Just a similar sort of question to the experts, what other Regulators use the actual costs of debt as opposed to notional?

MR BALCHIN: My experience is with the Australian Regulators and I think - I don't know of any example where they haven't used a notional benchmark allowance.

MS MAZZOLENI: John?

MR REDMAYNE: I don't have anything to add to that.

PROF BOWMAN: I'd agree, I haven't seen anything else, I'd make just one other comment about the actual. With smaller companies that don't get their debt in public debt markets, if they get their debt primarily through private sources, banks and so forth, which tend at least to be at somewhat of a higher interest rate; if you set their debt risk premium based on public and then set their issuance cost-based on actual which are lower for private debt, you're mixing apples and oranges, I think you need to be consistent between those two.

MS MAZZOLENI: Okay, the next question is to the company representatives. If a ten year term for the risk-free rate is used, how do parties propose the Commission should estimate the ten year debt premium? And if a ten year term for the risk-free rate is swapped to five years, is it permissible to use a ten year debt premium? In the straw person example the difference between the five and the ten year premium was 20 basis points but it could obviously be a lot more than that, or should a five year debt premium be assessed separately? Who would like to kick off?

MR CARVELL: Perhaps I'll start, I don't think I can answer that question on the fly so we'll come back in cross-submission on that issue.

MR MORGAN: I'd have to give that some more thought except to say that previously I said that we perhaps should look at a range of maturities and that's going to have different premiums along that range. You know, up to four years at the moment you can probably get bank premiums, but going out to ten years you're talking about the bond market, and I guess that's the only public source of information in terms of premiums. I don't have a comment on the second part of the question, I'll have to give that some more thought.

MS MAZZOLENI: Okay, that looks like it's a question that most parties would prefer to address in submissions, thank you.

MR ROBERTSON: I'd just like to say that if you can tell me where I can get ten year money at 20 basis points over five year money I'd be very interested. **[Laughter]**

MS MAZZOLENI: I agree, it did seem rather tight. If we can just look at the straw person example now which is on page 9 through 11 of the EDB example, and could parties just suggest to us, I mean obviously we've heard a couple of comments today as to what bond should be referenced to, but if parties could look at that and just suggest where the straw person should be calculated differently to what's been proposed here.

DR LAYTON: I'm happy to start with that. In broad terms I'm not too unhappy with what the straw person actually proposes. But I think it would be desirable if instead of the comparison being limited, as it is in the straw person, to firms in the same industry or sector that it be broadened to consider all plain vanilla debt issued by all New Zealand firms with investment credit grade, so that you don't have to restrict it to the electricity market. I think that's in this particular case, or the airport markets if you're dealing with airports, that's because I see there's a debt market related to credit grades rather than debt market specifically related to individual industries.

I think that you should allow that debt premium for the company, however, to be no higher than an implicit premium if you do get for a particular company comparable data from recent experience. One of the rather irksome experiences in the airports situation over many years is that one of the particular airports has always come up with a debt premium significantly above what when you get the information disclosure information back the actual debt premium was each year.

So despite the bankers' attestations it seems like they seem to be able to do significantly, and I mean significantly below it in one case. So I think that suggests to me that that company is in a better position and is able to convince its bankers it should tell the airlines it's the position it's in, and I think you need to be on the look-out for that.

Debt issuance cost, I think it should be amortised through the regulatory cashflows or treated as an expense, and the cost as the Commission proposes, and that cost of debt should be determined in terms of promised rather than expected yield.

MS MAZZOLENI: Thank you.

MR HOOGLAND: I don't have anything greatly to add to the calculation other than to agree with the comment that in the case of the debt premium you can look at all firms with the equivalent credit rating. I just do note, and I think the point was picked up by earlier speakers, that in the table that you've got there you've got quite a wide range of credit ratings there, and given particularly in the sort of, you know, from BBB to BBB plus to A minus there's a reasonable spread. I suspect that you may need to tighten up on your definition of what a benchmark credit rating is.

MS MAZZOLENI: Thank you.

MR BASHER: In an airport context I think we need to sort of separate out this issue of regulatory disclosure versus the pricing for the airports which stays under the old regime and in that scenario there is consultation between the airports and airlines as to how the WACC will be set for pricing purposes and how the debt premium in that case will be structured, and that comes down to an evidential requirement for the airports to put something in front of the airlines to sort of discuss that through.

The other point is that historical comparison I think of actuals to the WACC sort of being used in pricing is something that again is part of consultation and has to be worked through with the airlines with that process. It will become a feature of information disclosure going forward and it will sort of come down to the level of specificity that's discussed when a range is established for information disclosure. So we can perhaps talk about that tomorrow.

MR TAYLOR: Is he coming tomorrow? **[Laughter]** Sorry.

MR ROBERTSON: The point I'd make is that for practical purposes we do amortise the debt issuance cost and include that and reflect that in our cost of debt, which is different.

MR COCHRANE: Similarly we amortise any debt issuance cost. Again I think looking at some of the points we've heard earlier that we're looking at a forward programme, so in terms of when the Commission is considering actuals versus what the benchmark is there we need to look at the period as a whole, particularly if it's five years because the level of development and level of interest cost is likely to change as refinancing occurs and greater investment occurs.

MR BALCHIN: I think this is the right spot to talk about this. I just have a couple of comments about using Bloomberg fair value curves and Bloomberg for this purpose of source of information. We have a lot of experience in Australia with doing that, we've used Bloomberg fair value curves to predict our benchmark debt raising costs for a number of years. But it's important when you do that to, I suppose, scratch the surface to make sure it's actually working well at the moment.

Bloomberg takes the source of information, opinions from banks about the yield of corporate bonds on any particular day, Bloomberg then converts that using a proprietary algorithm into its price for those bonds, so they're the BGNs or the BCMPs you get out of BB. It then fits a curve to those using again another proprietary algorithm, part of which is identifying and excluding outliers.

The Bloomberg method worked reasonably well, or fairly well in Australia by according to any test, until the global financial crisis started. In that process I suppose the disagreement between banks about the value of bonds on any particular day increased by an extraordinary amount. Basically there was no trade going, so banks didn't know what the bonds were worth. The Bloomberg algorithms weren't able to deal with that, they systematically set Bloomberg prices at the lower end of the fees from banks, and at times excluded half of the observations as outliers and fit the curve systematically at the bottom of the dots.

The Bloomberg service in Australia now seems to be performing well again because there is some secondary trade that's restarted in the corporate bond market, but for a period of time it was objectively performing very badly. So I'd suggest before you use either Bloomberg prices, or Bloomberg curves, or both, that you make sure that neither of those problems persist.

And if you're looking for the Bloomberg feeds from the banks on the Bloomberg service you don't actually automatically get those, you need to get permission from the banks individually to get access to those, so they're hidden, so that's another trick. But I suggest you test those just to make sure they're giving you reasonable results.

MS MAZZOLENI: Paul, comments on the straw person?

MR GOODEVE: We'll come back with any comments in cross-submissions.

MR REDMAYNE: The first issue I guess is the sample selection. In an ideal world it would be companies in the same industry with the same credit rating or the target credit rating. Obviously in New Zealand there's not a lot of bonds traded so I guess I sympathise with

the need to look outside the industry perhaps to other companies with the same credit rating.

I think it's helpful as well as just looking at the credit rating that it shouldn't just be set in isolation and then look at the bonds, there should be some sort of cross-checks just to check the gearing and, say, the interest coverage ratios for the companies being looked at to make sure they align with the regulated firm of interest.

In terms of the debt term, we've heard a lot of talk here about the companies essentially trying to optimise the term of their debt weighing up a number of things, and that includes I guess minimising amortised issuance costs, and I think it's therefore sensible to include those costs in part of the debt analysis rather than a separate cashflow line.

And so my view is the cost of debt should be calculated based off some kind of optimal borrowing term or actual practise of companies that are operating in an unconstrained situation, and that can then be expressed as a margin over the relevant risk-free rate. If the Regulator then wants to treat the risk-free rate as being the same as the regulatory period then there should be a notional swap of the base risk-free rate back to that of the regulatory period.

However, the debt premium, we've had a look at this for Telecom and the Commission has as well with the latest TSO ruling, it's not really practical to try and swap the whole debt premium for the term of that. So where the Commission got to on the most recent TSO ruling I think is on the right lines in terms of how to approach debt.

I'd add one other comment about the Bloomberg fair value curve in addition to what Jeff said. Again it comes back to the thinness in the New Zealand market. You need to be very careful what goes into different sorts of indices or whatever, and the footnote in the straw person example states the composition of that fair value curve, it's two Crown owned entities, one local Government entity, one co-operative and two utilities, so I question how good a benchmark that really is.

And it comes back to the point I made yesterday, I think you need to be really careful about trying to take comfort in other indices or other people's work, I think you're better to try and do the work, select the sample and do thorough work on the sample yourself.

MR MORGAN: Unison doesn't have any bonds in the market but it's something that we are looking at in the near future. And one of the questions that I've been talking to Treasury

advisors about is what we would, if it was a retail bond what we would have to issue that into the market. I guess this comes back to some sort of execution risk.

So if we look at a similar traded or similar credit rated company and what that's trading at we may have to issue a premium above that to execute that. So I guess there is a question mark around for us the name recognition and execution issue compared to some of the other more commonly known players in the market, but we can perhaps provide some more detail on that in a cross-submission.

MR SHELLEY: I'd agree with what Jeff and John have said. The only extra comment I'd add to theirs is a reason why you would want to include issuance costs in the total cost of debt is that it actually is relevant to the total cost of debt. If you're raising retail bonds you have one issuance cost which comes into your cost of debt. If you're looking at wholesale bonds or private placement you've got different issuance costs there, and unless you take the total cost into account then you're actually potentially coming up with something suboptimal.

MS MAZZOLENI: I guess an issue with the issuance cost is again we are only able to access public issue costs which are significant - you know, the costs of a public issue are significantly higher than -

MR SHELLEY: I think that's right and I think one of the things that the regulated companies are going to have to do if they want this sort of information to be taken into account is be a lot more transparent with the Commission. If they want it to be taken into account, disclose it, if they're happy to sit behind a wall well then they suffer.

MS MAZZOLENI: And again it goes back to the question we posed before about what information would be provided in a, you know, a fairly transparent and simple way for us to assess particularly bank issue costs so that we can look at the mix in both bank issue costs and the public issue costs.

MR SHELLEY: I think Greg certainly said before, we'll come back in a post Conference submission, but I think one of the things we want to do in that is to actually set out how the Commission could assess the cost of different instruments and where it could get the data from.

MS MAZZOLENI: Thank you. Any comments on the straw person?

PROF BOWMAN: The reasons why people choose public versus private debt, there's many of them, but part of it involves the trade-off between the price that you have to pay for the debt in the market or privately versus the issuance cost, and there's a broad statement

public debt can be sought at a lower rate but a higher issuance cost.

So I think if you're going to set the rate itself based on public issuance then consistently you need to base the issuance costs on public issuance aside from what actual costs might be. If they're financing privately that has interest rate difference implications, it also has issuance cost implications and you can't mix and match. I think you need to be consistent.

MS MAZZOLENI: Alan, any comments on the straw person?

MR CARVELL: Just a couple; just to put my previous comments into context, the rate observed here for the Vector bond is 2.13%, which is sort of at the top end of the range that is referred to in paragraph 49. The work we've had done in terms of our debt portfolio if that was established in sort of the current market environment at a time just preceding this 1st of September 09 date, we think that debt premium derived based on our bond observations is about 80 basis points less than our average debt margin, so that is the underlying concern we have about I guess this approach.

And that 80 basis points, even once it's taxed and fed into the weighted average cost of capital is probably still in excess of the 20 basis points that the Commissioners were concerned about yesterday in the context of model choice, and the leverage issues. So we think that's a material concern.

In terms of issuance costs, I think in our submission we've run the argument that we would prefer to see issuance costs accounted for in the cost of capital. That's largely a concern that under a default price path regime it's not immediately apparent how the statement that issuance costs could be dealt with through cashflows is actually manifest, but I guess in practical terms if the Commission was to go down that path we would expect to see an explicit adjustment in the rate of return calculation that the Commission would use which would factor in an allowance for issuance costs.

MS MAZZOLENI: Thank you. Any comments on the straw person?

MR SMALL: I guess as practitioners we would agree with what Mr Redmayne says, the first point of the straw person is probably ideal in an ideal world but really a much broader set needs to be taken to begin with and often we would also cross-check it against Australian data to begin with and take a larger sample, but of course that means adjusting as you go for a number of factors to try and identify the appropriate cost of debt for any one company.

In the case of Maui the problem we have is that one of those factors that we would

adjust or sense check against would be credit rating or credit risk factors, and some of the important credit risk factors for Maui around contract duration and stuff are not known to us, so that creates a little bit of hole in the adjustment. I think in practical terms when we're advising clients on the cost of debt we include the raising costs in that cost so that would suggest we follow that approach.

MS MAZZOLENI: Thank you, I'll just get Martin and Russell to make any - sorry.

DR MARSDEN: I just make one comment, there's a number of I guess comments that I see in the sort of economic press that say that at the present point in time the New Zealand bond market does suffer from thin trading and there's also current sort of excess demand, part of the so-called sort of flight to quality that we've seen from the credit crisis that has potentially I think pushed down yields. So we'll try and provide some evidence of that in submissions.

I don't have any evidence to support this, but when you see companies issue new shares or initial public offerings that's often at a discount to the market price, so it wouldn't surprise me that when companies undertake a primary yield that those yields are different from what you see yields traded in the secondary market.

And then just finally to pick up on John's comments, I don't see anywhere in the straw man example any allowance for hedging costs given I think that prudent companies will borrow for terms clearly different than the regulatory reset period. So again if the Commission is going to take the view that the risk-free rate, the term of the risk-free rate should match the regulatory period there should be allowance for swap costs there.

MS MAZZOLENI: Thank you, and you're all going to come back to us with how we would assess those hedging costs for any of you that reinforce that point in your submissions. I'm just going to close the session with any comments on debt premium by Russell and Martin.

MR INGHAM: All I'd really want to do is to I suppose reiterate a point yesterday that I made, is that one of the practical problems you have from a data point of view is simply that the bonds that are physically traded in the market are a very small subset of the actual debt out there, and then the problem is well how do you get your hands on in some sort of transparent way data relating to the rest of the iceberg, if you would like to call it that, because we know that that's actually probably the more informative component, because it's certainly by far the biggest component of the debt that's on issue.

MS MAZZOLENI: Thank you Martin.

DR LALLY: A couple of comments about the straw person example. In table 4 Transpower appears, although it doesn't affect the numbers because its credit rating is above the band that you're interested in, so in practical terms it doesn't matter. But I would say to you that a firm like Transpower should not be looked at under any circumstances for the purposes of assessing a debt premium.

Transpower has a low debt premium and a high credit rating for very obvious reasons, and one of those obvious reasons is that there is an implicit tax payer guarantee that attaches to any public sector entity. That of course pushes down the debt premium. So I would say do not use any numbers from public sector entities.

The second comment I'd make is that the more one looks at this problem the more difficulties one sees, and although in the example it's clearly stated that the bonds you're looking at are senior, senior unsecured, if all of a firm's debt is senior unsecured then the traded bonds you're looking at are representative, even if they don't form the overwhelming bulk of a firm's debt they are in that sense representative.

But suppose you have a firm that has got some senior debt and that's the stuff you're looking at, but it also has subordinated debt. Well, what you're interested in is its overall cost of debt, and if a firm goes from a situation in which all its debt is senior to one in which some of it is senior and some of it is subordinated then the senior stuff will experience a lower debt premium than in the previous case.

So there is a risk in looking at senior debt that if the firm in question has some subordinated stuff the numbers you'll be getting from the senior debt is simply too low. Now that's a practical difficulty that it's difficult to avoid in the New Zealand case.

Could I also make a mention of some points that cropped up before the straw person example was looked at. John Redmayne has referred to recent work in the telecommunications area which I think it's fair to say has examined the question of debt premiums and issue costs and swap costs much much greater detail than has ever been looked at by the Commission before. And perhaps one of the reasons for that was that the TSO situation was very unusual in that the regulatory period was a year and everybody agreed that firms didn't roll over their debt on an annual basis, and my recollection from that analysis was that John was reasonably happy with five years being used as an average term for firm borrowing.

And I don't recall objections from other submitters on the idea of an average borrowing term of five years. However, we are seeing here this morning most people are

talking about a borrowing term more like ten years than five years. I don't know what the truth of that matter is and for the purposes of comments I made before the morning tea break I was prepared to accept it as given that the typical term was ten years.

But the conclusion I reached in the TSO situation was in looking at a regulatory situation with a cycle of one year and firms for argument's sake borrowing for five years, was that you could deal with the interest rate risk arising from firm's borrowing for five years, but the Regulator coming in and specifying the number on an annual basis that the interest rate risk could be dealt with by swaps.

There were doubts about whether that could be done with the debt margin and the conclusion I reached there was that if on an annual basis you were to set the debt premium in accordance with a five year debt premium rather than a one year debt premium that the consequences were a violation from the NPV equals zero rule but surprisingly enough the violations were quite small.

So if we extrapolated that result to the present situation where the regulatory period's five years and were prepared to accept that the typical borrowing term was ten years, it seems to me that the Regulator every five years using a ten year debt premium rather than a five year debt premium, that the consequences in terms of the NPV rule would probably be quite small here as well.

MS MAZZOLENI: Just two comments, I think the gap between the five and ten's already been referred to by Simon might be quite a big bigger, and just secondly in terms of the point you made about the sample set here, I mean on that basis of the implied guarantee you'd knock out a couple of other companies in this as well. So -

DR LALLY: That's a difficulty. Could I just make a comment about the 20 basis points I think you were referring to as the margin between five and ten years. When I referred to a present valuing operation I was referring to a present valuing operation over the entire future life of the firm - if the 20 basis point figure is unusually high at the present time then the present valuing process out to infinity would dampen that down quite seriously.

MS MAZZOLENI: I think we're saying that it's the other way around but I think we will close the session there and Pat's going to pick up financeability now.

MR DUIGNAN: Thank you, just before I begin financeability but in the spirit that it is highly relevant to financeability could I reiterate that the long - I mean the purpose of input methodologies is to promote the long-term benefit of consumers in the markets referred to. Secondly, that we are setting input methodologies that will in principle not be

reviewed for seven years, so therefore they apply to at least two regulatory periods, and therefore for ten years in total.

And that personally as I see it I have a concern that the framework we have does, as indicated in the discussion yesterday, result in a cost of capital as estimated that increases as with leverage, and that it also sounds from the discussion that if we were to accept propositions that have been aired this morning the net result of them in aggregate would be to further increase the cost of capital estimate.

This does result in a concerning set of incentives, and while there was a tendency yesterday to somewhat assure the Commission that incentives which arose out of a methodology that ends up allowing for a higher CPI-X cap, well when translated to notional revenue for particular firms, because one assumed higher leverage assumptions it then assumed other matters regarding the actual debt costs, would not lead to in practise a incentive for higher debt levels. I have to also read that against the comments this morning about the volume of debt that it is proposed to take on board by various regulated entities.

I mean the bottom line is that if corporate finance teaches us anything it must surely be that leverage does not increase the cost of capital in reality, and that the assertions being made around the table as to planned increments of debt would only make rational sense if the net effect of them as compared to undertaking projects on an all equity basis was to reduce their cost of capital.

And that to the extent that we end up with a methodology that doesn't reflect that it is a major concern because this is one of those areas where it is paramount in the long-term interests of consumers that the entities that supply these regulated services are in a very stable financial condition, we're about to talk about how we respond if we were to conclude that the net result of all that is being put in place was to not be financeable, that they were not in a satisfactory finance condition.

I will be continuing to press our advisors on cost of capital modelling, including Martin to come up with responses to this concern, but I do want to reiterate that I see it as a very major concern. And with that I will turn - I just mention that because it is the background to today's discussion on financeability.

In principle in the net present value equals zero approach as applied using a normal return on capital, that is to say the required return on capital as accurately estimated if we could do so, then applied through a CPI-X framework which is what we're

doing, and translated into a notional revenue path, one would expect that the timing of cashflows is the issue rather than the net present value of them from a point of view of their financeability.

And the first issue that I wanted to raise and receive responses on was to ask the question, is it valid to take as a view that if we have financeability concerns that the appropriate course of action in the first instance would be to look at the way we treat elements such as depreciation which affect the cashflows as opposed to considering a adjustment to the cost of capital number because of that concern.

And so I've explained why that proposition, or the background to that proposition. I'll reiterate it, that to the extent that there is a financeability issue that one should look for the timing of the cashflows rather than to some ad hoc adjustment to the cost of capital. So if I could invite views of both companies and experts on that proposition. Shall we start with -

DR LAYTON: The Commission's proposition in relation to financeability is that it would really in its written documentation along the lines you're suggesting that they start out with first of all checking the calculation of the inputs and then look at the gearing issues and the altering of the pricing profile which would involve the depreciation, and then before they get to adjusting the cost of capital.

In broad terms I think that's the right approach if you do have a concern that you should start with thinking have we got the calculation of the parameters right and is that working then moving on to gearing and pricing and adjusted cost of capital. The final one I'll put in, which I'm sure none of the institutions themselves will raise, is the Commission should also think when it gets to the end of it whether in fact the finances proposition is still of a view that the financing is a difficulty, whether it should actually raise the cost of capital, because many of these assets will still be there even if the current owners go broke.

If the current owners are unable, through their operating costs to be able to run the business in a successful way, and it's the Commission's judgment that the costs that they're being granted implicitly in the price setting regime for the capital and for their opex are efficient but they still have financeability concerns, maybe the best thing is to let them go broke and allow somebody else to come through. I don't think it's the Commission's role to provide social welfare for shareholders.

MR DUIGNAN: Thank you, I'm sure that provocative comment will ensure a lively

conversation **[laughter]** but if we could not spend an undue amount of time refuting the point please, because we do want to cover the other option.

DR LAYTON: I thought it was irrefutable.

MR HOOGLAND: Without wishing to refute the point I think in terms of the question as to whether the adjustment if there's a financeability problem is to a cashflow issue or whether it's through adjustments to the WACC, I think there's a step in the middle which is essentially saying what are the causes of the financeability problem, and I think that's where the Commission needs to do some analysis to understand whether it's the WACC parameters that perhaps have been mis-specified, whether it's the capital structure of the business, whether it's if the business is, to pick up Brent's point, an efficient operator or an inefficient operator.

And I think also there's an issue that needs to be analysed if there's a financeability problem as to is this a permanent problem, in which case obviously the option of getting a new set of shareholders may exist, or is it a transitory problem.

So, I don't think there's a simple answer to how you address a financeability problem, I think it requires an analysis of what are the causes of that problem and that's likely to lead you in the direction of the solution.

MR DUIGNAN: Thank you. Just to give a little bit further background to ensure that all our participants understand the context, we are talking about the setting of default price quality paths but with provision for organisations to seek customised price quality paths. I recognise, though, that the obtaining of a customised price quality path which would represent an adjustment for the individual firm would take a reasonably extended period, but then again financeability problems specific to individual firms or regulated suppliers it would be unusual for them to spring upon them, particularly given the assurances that have been made today that it's the approach to think in terms of long-term stability. So I just wanted to add that that is the context, if we carry on please.

DR SHEPHERD: I think it is a sensible thing to check depreciation, and inclusive of that is whether or not revaluations occur. Because both revaluations or otherwise and depreciation together are a very significant determinative of cashflows.

PROF VAN ZIJL: As with the previous speakers I think it is also important to go back and check the calculations, and indeed if there were concerns on financeability this may itself be indicative of the fact that there is something wrong with the various inputs that have been estimated. As with the comment that Stuart has just made, if the entity is operating

on the basis of ODV with valuation gains as part of revenue, then of course if that is indeed a large proportion of the allowed revenue, that may be the element that's causing the financeability issue. And maybe that's an issue that could be addressed.

But if it's not that - if that isn't the case and if it isn't the case that the inputs appear to be inappropriate then I guess one needs to say well is this an industry-wide problem or is it a particular member of the industry; and if it's an industry-wide problem then again I guess you go back to saying well is this a feasible industry, what needs to change in order for this industry to remain viable? And that focuses more strongly if it is indeed one single member of the industry.

DR MARSDEN: Just on the financeability issue, I agree with the Commission's first step that they would check the regulatory inputs. I notice the second step is to reduce the notional gearing assumption. I would say, though, that if you are looking to go outside some sort of reasonable bound, particularly if you were looking to go to zero leverage on that basis that you would need to take into account equity raising costs.

In respect of the issue of accelerated or changing the depreciation profile, beta I think also depends upon interest rate or sensitivity to interest rate shocks. And so if I have very long dated cashflows, all things being equal I should expect a higher beta than if my cashflows are, or a very short pay-back of cashflow. So I think there are some risk implications here.

And clearly I guess my last comment, if a project is not financeable because of the particular revenue profile, well that may inhibit investment even though that investment is desirable.

MR ROBERTSON: I think I better comment on Dr Layton's comment if I may. I struggle to see how letting them go broke would be in the long-term interests of consumers. In fact before a firm would go broke there would be large periods before that where the firm will be trying to survive; they will reduce maintenance, they will not invest, and therefore the quality of the service provided and/or the quality of new equipment would deteriorate accordingly.

In the case of Auckland Airport which has just been voted in the top ten airports in the world, best in Australia/Pacific, I'd argue that the consumers are actually getting a pretty good deal at the moment. And the greatest benefit that Auckland Airport can provide to consumers is making sure that the investment is there for the capacity of new airline entrants to provide competitive airfares around the world and around

New Zealand.

MR DUIGNAN: Thank you. You do realise that the implication of your statement is that therefore the Commission cannot be unconcerned about the incentives for leverage, because that is the flipside of the comment that if one accepts that the Commission needs to be concerned about the prospect of financial distress then I come back to the earlier point.

As we go around the table I think it's appropriate to say that it would have significant implications for the consumer-owned distribution businesses although their path prices are not currently regulated, but it does imply that consumer-owned businesses need to consider what is really in the long-term interests of their consumers who own them. So with those comments, just really building off the point that was made, let us proceed.

MR BALCHIN: I think when we're talking about financeability you need to first ask the cause of the problem. When we talk about using depreciation you're really talking about dealing with a transitory type issue, for example a lump of capex coming through because by bringing forward cashflows through depreciation effectively you make your financeability problems harder and worse in the future than what they are now. So that if there is an ongoing problem it's not going to be remedied through bringing forward depreciation, that's really an appropriate means of dealing with a lump of capex.

I'd also make the point that that's one tool in the tool box, the other tool you can use is to change the definition of capital and operating expenditure for a period of time, or for types of assets. I understand that Ofgem did that with some gas pipes where there was a large replacement required and it allowed some of that expenditure to be expensed straight away and the remainder was capitalised, so that was a way to deal with the ability to finance a lump of capex.

Now the harder issue is probably what if there's a sort of financeability issue on the business as usual type basis. By this I mean a firm with a benchmark financing structure by which I mean an industry standard type financing structure with your cost of debt, your cost of equity, WACC assumptions, what if it can't meet normal credit metrics.

I think if you set a RAB that's based in and around the replacement cost type valuation that's very unlikely to occur. I have been involved in cases in Victoria in the water sector where the Regulator was setting asset values for non-metro urban water suppliers where they had RABs that were close to zero in some cases or quite low, where

this was quite a problem on the business as usual basis. So they're actually given - in that case they're actually given a higher RAB than they otherwise would have got to ensure that they maintain normal credit metrics.

I think, though, for the industries around the table here where we're coming from, I think it would be quite unusual that you would generate financeability type problems for a benchmark financed firm. The question then comes to what if it's the firm's own fault that it's financed in a bad way or some other way. I'd advocated the use of a benchmarked financing structure. I said one of the reasons for that is that it protects customers from this sort of risk.

So that means I actually do have a lot of sympathy for Brent's views, that I mean in principle at least the firm should be allowed to fail. I think, though, in practise, I mean this is one of those issues where if you went back a couple of years ago and asked people whether firms around the world insurance companies, for example, should be allowed to fail if they do inefficient things, economists would probably say yes of course. We now know that there are some firms that we would categorise as too big to fail.

Just as a practical example we had a situation in Australia where a pipeline, the Dampier Bunbury pipeline serving Perth, very important pipeline, a lot of gas flow generation in Perth; it went bankrupt, or almost bankrupt, into receivership, in part as a result of a Regulator setting a price that was lower than it expected. I was actually advising the Regulator in that case. **[Laughter]** And capital was actually locked up.

The first things that banks come in when they get control of assets is to say you can't spend money on anything that's not absolutely essential, and there are required augmentations for that pipeline that didn't go ahead for a substantial period of time, there was shortages of gas and blackouts as a result of that. So there was some social harm associated with that.

So I suppose what I'm saying is I have substantial sympathy for Brent's views that firms - that if you have a situation where you want to place the risk on the industry to do efficient things you have to let them fail as well. But I think in practise where you have a very important supply situation where the benefits to the community are much larger than the costs incurred that - I mean there may be situations where you need to have a rethink, I'm not saying I have a rule or a magic bullet, but just like we've decided that some firms during this crisis are too big to fail, that may turn out to be the case as well for utility firms.

MR DUIGNAN: Thank you. The Commission of course doesn't have any such mechanism available to it, that is any, say, over the actual debt ratios or leverage that companies adopt, that's the only influence it has is the incentives it sets in its processes.

MR GOODEVE: One thing I would comment about just as an observation is there does appear to be some concerns from the Commission that organisations will run out and increase their leverage willy nilly and invest money that's not there. There are actually parties out there who actually have skin in the game and will keep an eye on that. I know banks and owners obviously have their money involved and will be keeping a pretty close eye on that along with rating agencies and the like. So, I don't think that the actual reality of that is quite as large as we may initially worry about.

MR DUIGNAN: Yes, thank you, of course the same parties were in 2008 very happy in the US.

MR REDMAYNE: In the revised draft guidelines the Commission has set out four courses of action in order of preference for dealing with financeability. The first one is to basically recheck the inputs to the building block calculations, the second one is to reduce the notional gearing assumption in the WACC, the third one is to look at the profile or timing of the cashflows which is the issues that have been discussed, and I guess the options there are regulatory depreciation, revaluations and regulatory tax are three that spring to mind, and a fourth one is adjusting the cost of capital which I presume means increasing it to make the business more financially viable.

You've asked about essentially whether the timing of cashflow should be done before or instead of adjusting the WACC, and in the revised draft guidelines there are essentially two adjustments that are proposed. The first one, which is the second course of action to reduce the notional leverage assumption. In my mind that adjustment is essentially meaningless because with a sort of waft of the wand you make the financeability problem eventually disappear, you're just going to assume the leverage is lower and lower until interest coverage and everything comes right and then wa-lah you don't have a problem; and to me that doesn't seem to be a very sensible outcome or approach.

If there's a financeability problem where the firm is operating within, or assumed to operate within normal levels of leverage, then I think you need to look at the third and fourth courses of action. And in principle I think the third course of action looking at the timing of cashflows should probably occur before the fourth course of action which would be to increase the cost of capital.

MR DUIGNAN: Yes, we'll take on board your comments on the wording of the second aspect and will no doubt be capturing a different concept. I think the concept is one of the whole incentive framework and some other considerations, but thank you.

MR REDMAYNE: Right, just add a comment about the leverage and your concerns about that, we covered that yesterday and we'll put something in cross-submissions, but I think as the comments made by Paul, there are other parties looking at things and other incentives and so forth, it's not purely gaming the WACC number.

I think if you're using notional leverage on an industry-wide basis that reduces or eliminates the problem, and I'm also not sure how big the problem really is. The worked example that we had yesterday the chart, going between 40 and 60% leverage, it's actually plus or minus 2% of the WACC value on the central value of the WACC.

Now when you consider all the other errors and ranges around the various estimates, and we're going to talk about that toward the end of the day, it doesn't seem to me that that's necessarily such a big problem.

MR DUIGNAN: Thank you.

MR BEST: I think the financeability issue has room to be addressed in both the WACC margin and in the cashflows. Where the financeability concerns are risk related then I think the cost of capital margin is the appropriate place to address that, and where a cashflow adjustment is required, for instance, in operating expenditure being under-estimated or risks around opex or capex it will be more appropriate to adjust the cashflows.

As an example, the driver of revenue in the sectors that are regulated under default and customised regulation, the drivers are the CPI-X and building blocks models, and with respect to those models financeability concerns may arise in relation to understating opex or capex, that's something that can actually be adjusted directly through the cashflows.

The Commission generally relies on benchmarking or expert opinions as to what is efficient expenditure in setting, say, building block cashflows. But there's one line item which I think the Commission could potentially consider including in there that as a result of this efficient benchmarking model tends to be dropped out and that line item is contingency. I mean I don't know one competitive sector project that goes ahead without the budget including a line item for contingency.

Also in relation to the models another area of misstatement, and I think this is where we're now talking about a risk factor as opposed to a cashflow factor. That is the

difference between CPI and asset specific inflation, and the CPI-X approach is intended to compensate for overall increases in expenditure. And if actual or firm specific or asset specific inflation differs from the level of CPI that could easily cause a financeability concern for businesses over a regulatory period, but I think that's something that rather than be adjusted through cashflows is something that could be adjusted as a margin on top of the cost of capital.

MR SHELLEY: I support most of what's been said previously. Just thinking it through, though, in terms of the question that was asked, if there was a very generic costed benchmark cost of capital that didn't take into account the types of financing that individual firms could access, then it may be appropriate to look at that in the event of a financeability issue. But the sort of mechanisms that we've suggested that a portfolio of instruments is taken into account that reflects what different tiers of terms can access.

So I'll make the assumption that that's already taken into account, and then assuming normal operation it comes down to lumps in cashflow, maybe a lump in capex that needs to be funded, that goes to the point that Stuart was talking about that revaluations in depreciation need to be considered as a package there. Certainly adjustments to that that would affect the cashflows are far more relevant than trying to make ad hoc adjustments to the WACC. I was going to make the same point that John made on adjusting the gearing assumption doesn't change true financeability at all, it's just pretending that the problem doesn't exist.

The only other example that I'd raise that hasn't been mentioned is there could be a one-off catastrophic event that affects a firm. So putting aside the issue of have firms financed efficiently, assume they have, a particular firm may face a catastrophic event, an either quake that affects a particular EDB or other regulated business. I think then you're clearly stepping outside the boundaries of what the normal regulation is intended to address. And you're going to have to look at that on an individual basis.

In that case it may be entirely relevant to step completely away from the regulatory framework and just look at what cashflows are required to get the firm through, and putting the infrastructure back in place that's required. But I think that is a completely separate situation.

And on leverage people have mentioned that there are banks and other financier's have got skin in the game. Certainly before the credit crunch you would have to be sceptical about how much attention was being paid to that, but I think the message that's

come through from terms over the last two days is that they've actually had a lot of difficulty in obtaining access to credit and when they have obtained access to credit a lot of it's been quite expensive.

So the environment that they're in now for raising debt capital is quite different and there is significant attention being placed on what those debt levels are, can they maintain it, are cashflow ratios adequate, those sorts of issues.

MR DUIGNAN: Thank you.

PROF BOWMAN: I agree with much of what's been said, including that philosophically I'm inclined to the let bad guys fail idea, but it does have social consequences I think that can't be ignored. I also feel that since, to the best of my knowledge, there's no existing problems, that is we have no EDBs that are in teetering or in serious jeopardy with the financeability issues right at the moment, that it's probably not particularly a concern, you'd like to think lessons have been learned. So I'd suggest that the Commission should diary this for 10 or 15 years from now.

MR CARVELL: Just I guess one perspective I would like to add, in the sort of EDB and soon to be sort of gas networks base, it does seem to me that when we talk about a review of input parameters etc in the context of a financeability issue, I have difficulty distinguishing that in my mind with a firm actually fronting up with a CPP in effect. So I guess I just sort of put that out there that I think it's a little bit abstract to talk about this in the context of something which isn't actually a CPP and therefore the firm coming up with a proposition which has embedded in it mechanisms to address its financing problems which the Commission can then opine on.

MR DUIGNAN: Thank you, yes, I mean under a default price path it's not clear how a firm specific capital structure would in fact be able to be applied, so you're quite right in registering the point that under the law some of the points that have been made are not available.

MR CARVELL: Indeed, I think, as I say, I find it hard to conceive of that dialogue taking place in a DPP context, much more likely in a CPP context where I think you could look at firm specific attributes.

MR DUIGNAN: While we're discussing weighted average cost of capital and cost of capital issues here, I think that some of the participants, particularly those who kind of haven't had reason because they are experts on the cost of capital to pay much, or to be particularly interested in the input methodologies, in other words Part 4 of the Commerce

Act as it now stands, may find it of interest to familiarise themselves - this is not a criticism, I should quickly add. I mean people who are experts in cost of capital have not until recently had any reason to be interested in that. But it does quite significantly frame what is available to the Commission, so it's useful to know, particularly if you're doing cross-submissions, thank you.

MR BUZZARD: Just from an ENA perspective, quite a narrow comment really. We'd be supportive of depreciation being brought forward, anything that would help businesses in terms of reducing some of their risks by bringing the cashflows forward would be appreciated.

MR SMALL: I guess the observation that I'd make is looking at paragraph 57 of the revised guidelines which says if the Commission concludes from the analysis that financeability is an issue then there's a number of things you can do and in order of preference they are. And I guess what that's lacking is that there is a number of things that can cause a financeability issue, some of them can be firm specific.

But they can also be to do with the regulatory regime, and we're interested to know what the Commission process might be for identifying the cause of the financeability issue rather than the fact of the financeability issue, because the solution of these four and potentially others as well really comes down to what the cause is. Quite well can be a timing issue, quite well might be something that you might not want to adjust for.

But I guess we'd like a recognition from the Commission that it is also possible that it's caused by the introduction of the regime and the content of the regime and the calculation of the WACC, and in that case then you need to take that on board and make changes. So I guess what we'd look for is your process for working through the financeability issue if it arises.

On the previous comment I think in the same paper you say that the social costs of setting cost of capital too high are lower than the social costs of setting the cost of capital too low, and that's probably the view that we would take as well.

MR DUIGNAN: Thank you. Russell or Martin?

MR INGHAM: Really in terms of financeability I mean I suppose the question that really comes to my mind when we first talk about that is to say well, what is the cause of the problem, and I mean if you look at the two aspects in terms of whether it be cashflows or, shall we say, the WACC being the discount rate; I mean certainly yes you should look at

the WACC in the context of is there anything that's specified in that. But if the conclusion is there's nothing - no problem there then it doesn't seem to me to be sensible to then play with the WACC as the solution.

If we're then talking about the cashflows, it seems to me that there's perhaps two generic aspects to that in terms of do the cashflows make sense in the context of the assets, and then the point that's been raised is the timing of that cashflow. In terms of the timing, clearly that is important in terms of having certainly a degree of smoothness to that in terms of being able to pay the debt bill in terms of generally we're paying a relatively flat interest bill, it's got to be paid on whatever basis in terms of satisfying any financial covenants, those sorts of things; but in terms of the overall level of the cashflow, then the question is is well if you've specified the WACC and therefore the revenue, the component of the revenue that comes from the return, I suppose I find it interesting how you could have a problem in terms of the regulated business itself.

But in terms of I suppose a solution to that, particularly where I say the regulated business is part of another business, but as I understand it the Commission doesn't really have the power to do any ring-fencing of a regulated business, it's actually part of another entity. So I suppose in that sense I do see a problem potentially for the Commission, but certainly I don't see a generic problem.

MR DUIGNAN: Thank you. Martin, did you have anything brief?

DR LALLY: A couple of brief comments. One in response to the suggestion that financeability problems if they existed should be resolved by bringing the cashflow forwards. If you took a business who's assets had a life of 100 years and you parked all the revenues in the first 50 years, that would raise concerns about intergenerational equity. In effect the people who were consumers in the first 50 years would be paying the whole bill and those in the last 50 wouldn't. So I think there are limits to the extent that you can manipulate the timing of the cashflows without changing the net present value that arise from intergenerational equity concerns.

Secondly, would like to pick up on a comment that John Redmayne made about changing the notional level. The notional leverage level can't solve the problem. There may be a misunderstanding about the nature of the financeability test. My understanding of it is that it involves assessing whether the business is financially viable at all times, assuming a particular gearing level, not assuming whatever gearing level the firm actually uses.

So if your calculations on financeability are premised on some notional leverage level, then of course if there are financeability concerns the problem could be resolved by changing the notional leverage level. Obviously whatever notional leverage level is specified in your financeability test a firm could adopt a much higher leverage level and that much higher leverage level could generate financeability problems for the firm, but that is a quite different scenario to the financeability test that the Commission would be applying as I understand it.

MR DUIGNAN: Thank you, and just summing up here, there's been advocacy of use of actual leverage and other parameters. I think the key point is that as both this discussion and our comments this morning on the way the Act works are intended to stress that it isn't clear that in practise anything other than a benchmark approach is available for the purpose; and secondly that we are effectively discussing what will happen at both the first and the second regulatory periods under input methodologies, or rather under setting default price paths and that there are precedents created by the way that we view the matter in the first regulatory period, which may carry over to how people or what is expected to be done in the second. So just when there are cross-submissions if those aspects of the way the Act works is taken into account it would be very helpful. Thank you.

CHAIR: Okay, I think that's a convenient point to now break for lunch. We've kept to the timetable this morning quite accurately. So we start again at 1.30, thank you.

Lunch adjournment from 12.29 pm to 1.29 pm

COST OF EQUITY

CHAIR: Right, can we make a start please for the last section of our two day workshop on the cost of capital, and I'll hand over to Commissioner Begg who will undertake the session on cost of equity.

MS BEGG: Thanks, I'm going to cover the tax adjusted market risk premium and estimating beta and then Pat will take the session on the investor tax rate. Just on the market risk premium, yesterday Anita ran around the table and asked you whether you'd adjusted the market risk premium in response to the financial crisis and we got responses, and I just wanted to summarise those and just check that I had the summaries correct.

She asked the advisors and the advice they provided is that in terms of advising

their own clients they continue to use a market risk premium of 7.5 to 7.75, just the different advisors, most were using 7.5 and KPMG have increased theirs a small amount to 7.75. Can I just check that whether that correctly captures the advice, and just actually Garth was one party, I wasn't quite sure whether you were using in advising your clients what market risk premium.

MR IRELAND: 7.5.

MS BEGG: You're use 7.5, and Brent?

DR LAYTON: 7.

MS BEGG: So we have a range from the advisors between 7 and 7.75 and Anita also asked the companies what they were doing and they were either using the Commission's WACC because they were looking at their own regulated cashflows or they were using approaches based on the advisor's rate. So just in terms of what people have been actually using and what the advisors have been recommending, we have the range between 7 and 7.75. Okay, Tony do you have a -

PROF VAN ZIJL: Yeah, just to add the proviso, if that estimate has been derived from looking back in a historical series of market risk premiums that in the current circumstance you need to recognise the most recent data will reflect in the negative returns and therefore a straight extrapolation from that will perhaps give a downward estimate, but on the other hand it's sort of subject to the uncertainty about is the past in total a good estimate of the future in total, and even if you've explicitly wanted to take into account the remaining duration, if you like, of the GFC just what is that duration going to be.

So there was a bit of a shrug of the shoulders there with it, but nevertheless if anything it kind of gives you cause for concern in terms of just extrapolating the past and therefore if perhaps previously you'd said 7.5 you might now feel even more confident about saying 7.5, if that was derived from simple extrapolation of a historical series.

MS BEGG: Okay, yeah.

PROF BOWMAN: If I could I think it needs to be appreciated this is in the context of regulated industries and with an existing Commission's view. It might well be that if Commission's view was 8% all of those answers would simply be notched up 1%.

MS BEGG: Although the question that was certainly posed to the advisors was in terms of their advice to clients not restricted to the regulated companies as I understood it. But you're right, the regulated companies themselves, some of them are choosing to use the Commission's approach, so it's not surprising that the same number comes up.

In terms of submissions we did have a couple of parties suggesting higher market risk premiums, and Synergies, who did some work for Vector, seemed to be an outlier in that regard, they're not here so I can't really ask them a question but perhaps -

PROF BOWMAN: I would be here on behalf - I was involved in that work.

MS BEGG: The main reason their number seemed high was because as I understand it they've used a risk premium for New Zealand versus the US of 2.5%. To me that seemed pretty high for New Zealand, and what I was going to invite Synergies to do is to perhaps expand on the evidence, the empirical evidence that would support that. Because although I can see reasons why New Zealand's a small country and I know that the returns are more volatile than, say, the US, but there's that systematic risk etc, it seemed to me a pretty high premium that was being put on.

And in terms of PwC, they did a similar estimation which started with overseas data and they added a risk premium for New Zealand of 0.6 which I think they based on Dr Lally's analysis. I just note that there's a big difference between the assumptions of country risk there, and I'd be interested in feedback on that. If anyone's got a comment now I'd be happy to hear it but it might be quite a specific point to look at.

MR BALCHIN: I could talk to our estimate, that was just applying the number that Dr Lally applied, so that was an illustrative thing. I mean you asked earlier about how the practitioners assumptions would compare to the Commission's own assumptions; I could talk about the PwC Australia practise which I think I mentioned yesterday. Our valuations practise uses an MRP of 6%. That's generally applied, although as I said yesterday not universally with an assumption of zero value for imputation credits, basically a Classical framework, which translates into an assumption in New Zealand without any adjustment for country risk of about 7.8%.

MS BEGG: Any other comments?

PROF BOWMAN: I'd comment in terms of the increment added over the US, that there's about 10 or 12 pages of analysis in here. But just to summarise the driving force behind it is just a characterisation of New Zealand as being a very small economy and the companies also being very small, and then trying to refer that, trying to think of that as if you had these companies either individually or collectively, but say collectively, introduced into the US market, what might the implications of that be, how might they be priced?

And just drawing on information largely in small firms, the relativities of small firms and where there's quite a bit of evidence and less evidence but some substantive

empirical evidence about countries, as to what pricing is for small firms versus large firms or versus the market in general. So the 2.5% is less than the premium that's attributed to small firms in the US economy, where small firms, that definition of small firms would be large firs relative to New Zealand. Kind of in a nutshell that was a key.

MS BEGG: Okay. Yesterday, Martin, you made the comment that the expert panel had taken, when they made their decision, the debt implications of the global financial crisis were apparent, but perhaps the equity implications hadn't been. And I just wondered if you had any views on if you were doing the analysis now whether your views would change?

DR LALLY: I think I did indicate my personal views yesterday perhaps too briefly, so if I could reiterate them, and stress that this is my personal view, the panel did not have any discussion on this issue, simply because our interaction ceased effectively well before Lehman imploded, which is a little unfortunate.

My personal view is that the crisis must push up the market risk premium, the market risk premium is a reward for bearing market risk and very obviously market risk has gone up. So I don't think it's controversial that the MRPs gone up, and quite possibly by a substantial amount because market volatility in the last 12 months has been appreciably greater than the average over the last 100 years.

The interesting question, though, is not what the MRP is today or what it's been over the last 12 months, but what it's going to be over the next five years, which is your so-called regulatory period. And the best guess I think you can make about the next five years is that the dramatic increase in market volatility we've seen in the last 12 months leading through to one would expect a significant increase in the MRP, that that must be asymptotic back towards the normal situation. Just how long it takes to get back there that's difficult to say, and I don't offer a view on that question, but I think it's clear that the volatility must be asymptotic back towards the norm.

I think if you were trying to say something about a market risk premium over the next week or month or year there'd be a much stronger argument for raising the number than if you were looking at an MRP over the five year period that's been talked about here. So I think there's a danger in experts saying more than they really can claim to be expert about. I think the most that can be said is what I have said.

I'd also mentioned yesterday that this kind of situation, the use of historical averaging data in these situations is not only too slow to pick up the effect but it also moves in the wrong direction as Tony has noted. If suddenly equity prices collapse, any

historical averaging leads to the estimate going downwards when it should be going upwards. And that's a draw-back of historical averaging.

So this crisis I think should indicate to the Commission the need to give significant weight to forward-looking estimates of the market risk premium as well as the historical averaging approaches. Now I see merits in both approaches, so I'm not suggesting you should put all your weight on forward-looking approaches, but I think there's a need to consider both.

MS BEGG: Thanks. Just then to summarise, I think that the views around the table would seem to suggest that a market risk premium between 7 and 8 would capture most people's views of where it should be. Obviously we have to pick a point and we do need to take into account estimation error, model error etc. But we think we'll do that in the last session where we look at the overall WACC and the adjustments we make. But I'll run around the table with having given you that suggestion and ask for you to give your feedback. Perhaps we'll start with Brent.

DR LAYTON: Certainly as I said my advice is still at 7 because yes we have had a dip and a change and the question we don't all know is how long that's going to last for. And the 7, as the panel of experts that the Commission had is higher than used in other countries, and so I've been happy to stick with the 7 in advising people about it as a reasonable sort of a figure. Because I've always thought the 7 was getting a little toppy before this crisis, so it's probably more justified now.

MS BEGG: That's a good point.

MR HOOGLAND: It seems to me there's two things we can infer from the views of all the experts, one is both from a theoretical point of view and a practical point of view the market risk premium has probably risen, and the second is there's probably a reasonable consensus but over time it will revert to a mean. That leaves an interesting dilemma for the Commission in the sense that there is absolutely no consensus on how long that period of time is.

And it seems to me that that means the Commission must adopt a reasonably cautious approach because there is at least a finite probability that that reversion to the mean may take place over a relatively long period of time or a significant period of time at least in the context of the five year regulatory period.

PROF VAN ZIJL: In addition to the point that I made earlier I'd just like to bring up the issue of consistency between the risk-free rate assumed and the market risk premium, and the

risk rate assumed at the intercept end of the CAPM equation. The Commission has stated that it now proposes to use the same risk-free rate in both, and if that's the case, but the Commission continues to apply a five year term for its estimate of the risk-free rate, then that would also suggest that maybe its estimate of the market risk premium should go up because generally the historical premia relative to bills is higher than it is relative to bonds, and so while I would possibly suggest 7.5% at the present time, based on bonds, I would suggest a higher number relative to bills.

And in that regard I was a little bit intrigued as to how the Commission actually supported the number of 7% when the reference made to, for example, the Dimson data was quite an old reference and I wondered how the Commission would go about updating its own estimate if the preferred approach remains the one of looking back at historical series.

MS BEGG: Okay, I'm just going to check with Martin, I thought that when the 7% estimate was done that the market risk premiums were estimated against a long bond; was that true or not, was it a short?

DR LALLY: I think we have to distinguish between the 7% number which I have recommended to the Commission for quite some time and the 7% number that appeared in the panel's report. My advice to the Commission consistently has been for estimating the MRP relative to ten year bond yields, what Tony would call bonds as opposed to bills.

However the panel, the other two members of the panel, Julian and Stewart, whilst coming up with the same number as me of 7 that they were defining the MRP relative to shorter term bonds, one year in particular, what Tony would call bills. So it was something of a coincidence that there was agreement on the outcome, although there was disagreement about the definition of the parameter.

MS BEGG: Sure, okay, thanks.

PROF VAN ZIJL: It's always an easy basis for agreement, isn't it. **[Laughter]**

DR MARSDEN: Yes, I've used an estimate of 7.5%, but again it's measured against bonds as opposed to bills, so if the measure was against bills it would certainly be higher.

DR LALLY: Can I just clarify something here just before proceeding any further. My understanding is that the Commission's tentative view here is to define the MRP relative to a risk-free rate that matches the regulatory period, and if the regulatory period is five years then we are talking in Tony's language of bonds rather than bills.

PROF VAN ZIJL: Shorter term bonds than the bonds that I have in mind which is ten years.

DR LALLY: Okay.

PROF VAN ZIJL: So I've referred to them as bills, but really they're bonds.

DR LALLY: Okay.

MR BALCHIN: I'll let John Redmayne talk about the PwC local practise, but as I mentioned a while ago the PwC's Australian practise valuation MRP adjusted just for the tax differences between Australia and New Zealand gives you a number slightly over 7.5, and that's without adjusting for any country risk premium; but as we've advocated in our report our conclusion was I think we said a minimum of 7.5.

Just other benchmarks from Australia, if you adjust the AER's current MRP assumption in a consistent way to New Zealand which means using their assumption about utilisation of franking credits or imputation credits, you get a number that's not far short of 7.5 before you make any adjustment for any additional risk associated with the greater volatility of the New Zealand market. And you should also note that that MRP is defined over ten year bonds not five year bonds, that was made very clear in the AER's most recent decision.

MR REDMAYNE: As Jeff noted, New Zealand practise we're using 7.5%. As I said yesterday we've thought long and hard about changing that with the GFC, global financial crisis, and I think partly because of the longer term perspective we have in the cross-checks etc we have a valuation scenario that's not been something we have changed, it's not necessary to adjust for that.

Martin made the comment we don't know how long this crisis is going to affect market pricing. And I think it is more relevant for the Commission because of the shorter term view, the one to five year view that it has to take, and I think there is information out there in the market, I haven't actually looked at it but I imagine we can look at implied volatility on long dated options on US stock indices for example, and also there's definitely information implicit in the debt margins on long-term corporate bonds. So obviously the market is pricing, at least for those instruments, in expectation of a higher return for the next, say, five to seven years.

MS BEGG: Just the PwC 7.5, is that based on your 2002 research?

MR REDMAYNE: It is, that's been updated although we haven't updated the publication primarily because our conclusion hasn't changed. The actual number has shifted around a little bit and with the last couple of year's returns it had gone up and it has come back a little, but with rounding and sort of, you know, having a policy figure we've stuck with

7.5.

MS BEGG: And am I right that you use short-term bonds, one year or less, rather than a ten year?

MR REDMAYNE: We do we use short-term bonds, the difficulty when you go back prior to the mid 80s is that there isn't a clean data set on bonds, so we've used what's described as short-term bonds but in fact they probably have maturities ranging between one to three years, although over much of that time the yield curve is fairly flat, so we don't think it's probably a big source of error.

MS BEGG: Okay, thank you.

DR LALLY: Could I just clarify something there with John. If your 7.5 is defined relative to, what, one year bonds, three year bonds?

MR REDMAYNE: It's defined relative to one year bonds where the data series is available, and when we go back it's the short-term bond that was available which may not be a one year bond, it could be anything up to, say, three years.

DR LALLY: Okay, but if you redid the whole exercise and defined your MRP relative to five year bonds, historically those numbers would tend to be higher and therefore your MRP number would be less than 7.5 defined against five year bonds.

MR REDMAYNE: If what you say about the level of interest rates is correct, that's probably the case, yes, but we haven't done those calculations, and obviously I'd want to check the data before giving any conclusion.

DR LALLY: Okay, but I just want to draw everyone's attention to the fact that whilst we're talking numbers here, it's important to be sure that they're all defined relative to the same risk-free rate term to ensure we're comparing apples with apples.

MS BEGG: Yeah, I agree.

MR BEST: Commissioner Begg, on your question about the market risk premium between 7 and 8%, that's something I think we need to study a little bit more so I won't make a comment on that now. Just in relation to Dr Lally's observation as to where the market risk premium may be now relative to where it may be rather soon, again I think without gazing into a crystal ball or anything, the bit of that observation that concerned me was I think it may be premature to jump back to the norm too quickly, because even in Dr Lally's observation you said, you know, if you were setting it up over the next week or year it possibly would be quite a bit higher, if you're setting it over a five year period it will be trending back towards that norm and will be trending back quite quickly. But

even that one year period, that's a one year out of four and so I still can't quite see it coming back to the, you might say the original levels, even if it was to trend back quite quickly.

MR SHELLEY: I'm just trying to think back to when the draft guidelines first came out and we were doing submissions. I'm pretty sure at that stage our submission on those guidelines was for 7.5%, and certainly in the advice to Unison on the revised draft guidelines our advice was still 7.5%. And I think you have to take a range of factors into account there, one is our view is the PwC number is well researched for the New Zealand market, but as Martin's indicated, it might be a little on the high side if you're applying it to longer dated bonds.

But on the other hand you have the type of evidence that Jeff was talking about when you look at what is a commonly applied MRP particularly in Australia and convert it back for the differences in the model applied, you get potentially a number in the 7.5 to 7.8 range. And our view is also that cost of equity certainly for an infrastructure business is a longer term thing, so the number of 7.5 we were comfortable with before and we're comfortable with it now.

MS BEGG: Thank you.

PROF BOWMAN: A fundamental issue that I have, and it has much to do with the approach taken in the Synergies report with respect to MRP, is that relying on historical evidence in New Zealand prior to the reforms in the mid 80s, and really even if you go post 80 you run into the crash and adjustments from it and so forth, but such that any use of long-term historical information has got to have at least a substantial caveat against it. And I was pleased to see the Commission make note of that in fact in its guidelines.

So the approach that's taken is like a benchmark approach, it's basically to say well where's the most evidence, where's perhaps the most appropriate benchmark to use and then build up from there and the obvious choice seems to be the US, the obvious and ever present disagreement. But there's substantial available information in US as to benchmarks that are put forward by people who are interested and informed but disinterested in the sense of not having a monetary tie to it. So not primarily relying on people like financial analysts or firms subject to regulation or so forth.

And then from that trying to think about okay, well what are the differences and that's how we get to the 8.5%. And I'd encourage people to - I'd be quite happy to here critiques from anybody about the approach that's in the Synergies report, because it's in

much more detail there.

I'd just like to make one other comment and that has to do with the GFC and the longevity of the implications of it. There's certainly some people that have said they believe there's a permanent repricing of equity risk premium. I think that's probably true at least to some extent. I'd agree with Martin there's probably some sort of a glide path back to whatever that new equilibrium is. But in thinking about it I find it interesting and somewhat peculiar that we tend to be talking about maybe a half a percent, 50 basis points, even when we're talking about applying for a five year period.

But if you look at the debt premium over a five year period and the implications of that you're talking about 150 basis points or 200 basis points. Why do we talk about that sort of an impact on debt risk premiums over a five year horizon today and then talk about zero to 50 basis points for the equity risk premium; I just find that incongruous.

MR CARVELL: Just two points, I think we would certainly concur with Martin Lally's comment about putting more weight on an ex-ante view of market risk premium, and I suppose in terms of the question around whether the effects of the global financial crisis are transitory or more permanent it is crystal ball gazing territory. But I guess I take some comfort around that view that it might be a relevant factor at least for the coming regulatory period given that AER, Ofgem and Ofcom have all shifted their market risk premiums on this basis.

MS BEGG: Any further comments?

MR SMALL: I can talk about KPMG's position if that's helpful. We can, I think, talk to the methodology if you have any questions, but our view is the market risk premium sits between 7 and 8% and I think before the financial crisis that this will be tending to below the midpoint of that range. But I think my colleague yesterday was talking about the recent examples where we've been at 7.75% and at least two of the three recent examples refer to risk-free rates that were a one year period.

And I guess we have had an internal conversation about the idea that the risk premium will revert back to the mean and should have some stickiness in it. I guess our view on that is that we've been unable to really substantiate that internally with evidence, and we're concerned that maybe the logic of that idea of returning to the mean isn't consistently applied through the rest of the simplified Brennan-Lally CAPM methodology.

So if we were wanting to take that approach there we would have to look at where

else we would apply it through the methodology. So this time we've just sort of parked that idea off to one side and we're not adopting it.

MS BEGG: Thanks. Russell or Martin?

DR LALLY: Some further comments picking up on comments that have been just made by people around the table. First of all this question of the number that's been used in Australia and what does it translate through to New Zealand; I think I'm hearing a 6.5% number in Australia translating into something like a 7.8% number in New Zealand. If I didn't hear that correctly please correct it.

MR BALCHIN: The 7.8 is the PwC valuation number of 6 in a classical framework converted into New Zealand. The 1.8 is just 6% multiplied by 30%, I can do that in my head. If you use your 5.6 it turns out to be about 7.6 interest free rate.

DR LALLY: Okay, the comment I was going to make is this question of how does a number in Australia that goes into the Officer model translate into a number in the simplified Brennan-Lally model? That's an issue that's come up in the past and I've presented my views on that, and when the Officer number was being used in Australia consistently by Regulators was 6%, the conversion that I was presenting was to turn it into a 6.4% number in the simplified Brennan-Lally model, which is still 60 basis points below the 7.

So if Australian Regulators have raised this number of 6% up to 6.5 then following the same translation process it would be 7.1% in the simplified Brennan-Lally model.

MR BALCHIN: Yeah, my recollection of your - to make your conversion you assumed a utilisation rate of 1. That's your assumption, no Regulator in Australia has ever done that. At the time the ESC was using a utilisation rate of 0.5, the AER recently raised its assumption of utilisation rate up to 0.65, that happened at the same time as the raising it to 6.5. I calculate if you assume a dividend yield of 4% and an average ranking ratio of about 85% I'd calculate the AER's new number translate into about 7.35, assuming a risk-free rate of 6%.

DR LALLY: I think, Jeff, you're correctly identifying the substantial point of disagreement which is over this utilisation rate, so I guess the point here is that the translation that you're offering is one view but it isn't a view that I share.

MR BALCHIN: Yeah, what I'm saying is if you're going to convert what a Regulator does into Australia into a New Zealand context you need to take the totality of that Regulator's assumptions, and they include that in Australia Regulators don't assume a utilisation rate

of 1 and they're quite clear about that.

DR LALLY: If I could comment on a couple of other points that have been raised. Jerry I think has referred to a discussion about raising the MRP by maybe 50 basis points over a five year period, whereas if you look at debt premiums on five year bonds through this crisis they have gone up by dramatically more than that.

I think that's an interesting comparison to make, but I'd be cautious about trying to apply any one-to-one rule there. That is to say if the debt premium goes up by 200 basis points I don't think you would want to immediately conclude that the MRP should go up by 200 basis points. The obvious reason for debt premiums going up by 200 basis points is that expected default costs on corporate bonds have gone up, and the debt premiums we're talking about here are defined in terms of promised yields, and promised yields incorporate expected default losses.

By contrast, the rationale for the market risk premium going up is nothing to do with expected default losses on bonds, it's to do with volatility on equities, and whilst those two phenomena would move in the same direction as a result of the crisis, they wouldn't be doing so on a one-to-one basis.

The third comment I'd like to make is that in common with my fellow panellists Stewart Myers and Julian Franks, whilst there was some disagreement between us on the weighting that you would apply to historical averaging estimates versus ex-ante measures, that we were, I believe, all in agreement with the idea that if you looked at historical averaging numbers the best numbers to look at were numbers that averaged across a multitude of markets, and the best data source that we have there is the Dimson Marsh and Staunton database on 17 markets, and by contrast my understanding is that John Redmayne's number is essentially based on historical averaging using solely New Zealand data. So there appears to be a difference in philosophy there even though the numbers are not greatly different.

MS BEGG: Does anyone want to add any further comments there?

MR REDMAYNE: Yeah, just confirming our estimate is based on New Zealand returns, but in terms of concluding on a final figure we have regard to other estimates as well.

MS BEGG: Jeff?

DR MARSDEN: Just one comment in paragraph 159 of the Commission's guidelines they talk about making Dimson et al 2008 estimates adjusted for long-term trends in price dividend ratios. Not now but I think it would be helpful if the Commission just clarified what they

actually meant by that, particularly when in a lot of off-shore countries you're also seeing share buy-backs which are another form of dividend payment. So it's just, it's not clear to me, at least from those guidelines, what sort of adjustments the Commission's proposing there.

MS BEGG: Okay, we'll take that on board.

DR LALLY: I might be able to comment on that but I just want to locate the paragraph.

DR MARSDEN: It's 159, Martin, of the revised draft guidelines.

DR LALLY: That appears to be a typographical mistake, possibly a typographical mistake. If I could indicate to you where I think this has come from. It should read 'price earnings ratios' I believe. The genesis of this comment is Stewart and Julian. The three of us agree that if you look at historical averaging numbers of the Dimson Marsh Staunton type, they are probably too high because the market risk premium has probably come down over time. And one solution to that in my view is to look at a range of other estimation methods, most particularly forward-looking methods.

Stewart and Julian strongly favoured putting most weight on historical averaging methods, but in recognition of the fact that that would tend to produce a number too high, they felt that some downward adjustment would be desirable. And a way of sensing how much the true MRP has come down independently of that estimation technology would be to have a look at changes in price earnings ratios over time.

So that discussion is reflected in the panel's report and presumably this reference in para 159 has come from that. So it may just be a mistaken reference to price earnings ratios rather than dividend yields.

MS BEGG: Okay, we'll follow-up with that. Jeff, did you have another point?

MR BALCHIN: No, the only point I'd make is it would be helpful if the quantification of that was actually made transparent so we could actually see what the magnitude of that adjustment was that Professors Myers and Franks had in mind. I don't think that featured in the report.

DR LALLY: You're correct, and I don't think I'm revealing any confidential information when I say that when Stewart and Julian expressed this point they never at any point quantified it.

MR BALCHIN: Okay.

DR LALLY: Stewart I believe made reference to adjustments that were being proposed by somebody else and he felt that it made a lot of sense.

CHAIR: Perhaps it may be worthwhile if matters are turning on what Professor Myers or

Professor Franks said that we may frame questions to them. I'd prefer if this was going to be a matter of some significance that we actually transparently put the opportunity for their views to be sought in writing so that that was available to the parties.

PROF BOWMAN: If I could, and somewhat related to Jeff's comment when I heard the timing of this was coming out I was quite looking forward in particular to reading the MRP section, and I'd have to say I was somewhere between surprised and dumbfounded to find that there was about five pages, the whole coverage of this topic, which is widely regarded as the most problematic and difficult issue in financial economics, was given such very very light treatment.

I mean even issues so fundamental, I agree it doesn't seem to be controversial, but a measurement issue between geometric and arithmetic returns is not mentioned at all, yet if you read like the Dimson et al material they use both, and they report both, and it's not at all uncommon to have people cite an MRP rate without talking about which it is, but they've chosen one way rate or the other when in fact the difference is pretty significant. Now I agree -

MS BEGG: I got the impression there was agreement between parties that arithmetic averaging would be used. The geometric would lead you to a much lower MRP obviously. I think Jeff in his use of the Dimson analysis has used the arithmetic.

MR BALCHIN: That's correct.

MS BEGG: Yeah, But you're just suggesting that they should be -

PROF BOWMAN: I agree, it's just an item that it could have been dealt with and disposed of quite quickly.

MS BEGG: True.

PROF BOWMAN: But five pages, particularly balanced against the somewhat lengthy discussions, and I'm not criticising the level of discussion, but in terms of balancing the importance and the difficulty, complexity of issues, and the treatment I thought came up quite short in that area, I was quite disappointed.

CHAIR: Can I perhaps suggest you highlight that in your cross-submission with a suggestion of matters or further issues you believe we should test with Professors Myers and Franks on that matter? That may be the best way to handle that.

PROF BOWMAN: Thank you.

DR LALLY: If I could just make a comment, I'm quickly looking over the panel's report to see if there is any reference to arithmetic versus geometric and I'm not seeing it. But there

was I think, if I'm not stepping over the bounds here again, never any doubt in our discussions that we were always talking about arithmetic.

PROF BOWMAN: I would agree.

MS BEGG: Certainly the Myers paper that Jeff referred to, Myers in that paper endorses the arithmetic averaging, so that's perhaps where I got my impression that that was an agreed position by everybody.

In terms of methodology I think we've heard a fair amount of discussion already about people's preferences for backward-looking versus forward-looking and acknowledgments of all the difficulties of the different options. I think if I could summarise there, there was preference for historical approaches of the Ibbotson type; there was some concerns expressed about the Siegel methodology, that was perhaps by PwC, and perhaps more mixed views on the use that might be made of methodologies that are forward-looking, or recognising how difficult they are to implement. But at a minimum I guess people would perhaps support the their use for cross-checking. So if anyone's got strong counter-views I'd be interested to hear them.

DR LALLY: Could I just make a comment on the subject of this price dividend and price earnings ratio discussion. A few moments ago I've just located the relevant section in the panel's report, it's on page 21, it's the footnote there. There is reference to both price earnings and price dividend ratios, and some discussion about the source of that idea. So it wasn't necessary for me to try and report any discussions that we did have, I think it is indicated there in the panel's report, page 21 footnote.

MS BEGG: Okay, thanks for that. I think then that we might draw the MRP session to a close and move on to beta. What I propose to do is address two questions and get your views on two issues. The first one is I'd like you to first of all tell us how you yourselves estimate beta for your own companies, and how the advisors advise the companies on that, and then we'll come to the straw man, straw person example and I was thinking there I'll get Russell just to give a brief summary of perhaps the data issues and the problems that we have encountered in doing that analysis, which won't be a surprise to anyone of course because this is a difficult area. So I'll start, I'll do counter-clockwise this time and start with KPMG and work around.

MR SMALL: For Maui because of the Maui pipeline operating code there's an agreement to follow whatever is at any time the Commerce Commission's most recent guidance on how to do things. So up until now that guidance I think has been the Unison decision, the

content of that is most helpful for how to calculate betas.

And in particular I guess I'd refer to a 2005 MED paper about the WACC methodology that we've followed that sets out six or seven different elements to thinking about a company's asset beta, and it's that report and the content of those headings, and we'll outline this in our submission, that leads us to the view that there's a substantially, or there are differences between a point-to-point gas pipeline in the form of Maui and perhaps the rest of the industry perhaps especially if you include the electricity distribution businesses.

And it's that approach which comes from the operating code and that leads us to look to Commerce Commission guidance that has led us through those steps to the conclusion that there should be a difference in treatment between Maui's asset beta and perhaps an industry-wide asset beta.

MS BEGG: Would you see yours as similar to Vector transmission as well, would you see your companies having similarities, or you think that Vector would - its transmission business would face different systematic risk to yours?

MR SMALL: I guess that's really something for us to draw out in the cross-submissions. We're not sure that there has been a consideration of the separate elements of the Vector business between it's transmission side and its distribution side and so it's been a little bit of an apples and oranges comparison because there hasn't been an opportunity to compare Maui to the Vector transmission business on its own without the distribution part. I'd be interested in Vector's view, but normally yes, although perhaps there's some increased risk for Maui but in practise we haven't had the opportunity to make that comparison.

MS BEGG: Sure, okay.

MR BUZZARD: It's not our practise that we regularly go through and routinely do. If we do go through the exercise we'll tend to rely on external advisors for that, so probably wait until John Redmayne says what he is going to say there.

MR CARVELL: In the context of betas, I think the best way for me to frame this is in the context of Vector's medium to long-term planning and in that context when we're, I guess, considering what the revenue profile might be for the regulated network businesses we look at recent Commerce Commission decisions, and that would include in this space the cost of capital material around Unison's engagement with the Commission in 2005 and the gas authorisation material most recently 2008.

And so on that basis from a sort of electricity point of view we're contemplating a

beta of 0.5 following the approach that Professor Lally promoted to the Commission where the US beta of 0.3 has been adjusted up for the fact that our control regime is a five year regime and that adds on 20 basis points.

Just on the other question of gas transmission versus gas distribution, I have to say we haven't got specific advice on this that I'm aware of, but intuitively I would be of the view that gas transmission would have a different risk profile and therefore beta to gas distribution. But as to whether Vector's transmission network had a different beta to MDL I wouldn't be able to comment on that.

MS BEGG: Thank you.

PROF BOWMAN: When I'm giving advice on this, because of the estimation problems or high estimation error for any empirical estimate of beta, I normally start with first principles thinking on it and one of the reasons - there's two reasons for that, one is that once you go - well step back, three basic approaches, a direct estimation approach where you have a company in their pure play but virtually don't exist. So although for publicly listed companies we might have an estimate you have to be careful about what you do with that estimate, because it's multiple businesses and because of the estimation problem.

So you're going to end up looking at comparable companies and I think it's informative to do some first principles thinking first. The Commission and Martin have both put out some quite useful sort of sets of issues to think about and I'm comfortable with those. So we could say reason our way through both for purposes of identifying what companies are good candidates for comparability and also even to some extent, although there's certainly also estimation error issues, trying to make a non-empirical estimate of what would be an appropriate beta. Then we do comparability, comparable companies, which is pretty standard.

I'd just like to mention one thing, when you do comparability, I've published a few papers and done some research on this as to what happens with comparability and looked at some of the measurable differences between companies and asked well, if you take the beta of this company that you observe and you compare it to the beta of another company, do you need to bring in any other factors in making that conversion.

And the result both in Australia and - I've done it in New Zealand but I haven't published that because the sample size is too small. I've done it in Australia, I've done it in two different ways in Australia and I've done it in the US. And the one thing that's consistent through all those is that size makes a lot of difference, it's the major one.

That's consistent with my earlier comment but this is a different context.

And what that says if you're, for example, looking at very large US utilities and then you're trying to think about them there's a size issue, or if you're looking about the largest of the Australia/New Zealand utilities and trying to apply them to a small company then you should be factoring in some sort of adjustment for size.

MS BEGG: I'd like to note this point that Vector, the Synergies report I thought went through these issues in a thorough manner, I thought that was - appreciated the effort that had been made there and the analysis and looking at the data source and so on.

PROF BOWMAN: Thank you.

MR SHELLEY: When we've done this for commercial clients, and that would be particularly for us in Asia but still in the electricity sector largely IPPs or network businesses, in one case a network business that also had generation, we've done the standard thing of going back to look at comparable companies. The issue of size is one of the issues to consider when you're looking at comparables.

One stage we were lucky enough to have a client who had the budget to go for a full information beta analysis where we tried to separate out the divisional effects and weighted each division and used dummies and all that sort of stuff. But typically if you can, yeah, obtain companies that are as representative as possible and just do the standard analysis.

MR MORGAN: At Unison we've tended to look to decisions by the Commerce Commission for guidance on this and the most recent being the gas decision, and so we've been assuming a 0.5.

MR SRZICH: At Telecom we look at our own share price on the New Zealand market but obviously we complement that with standard practise of looking at comparable countries in other jurisdictions.

MR REDMAYNE: When we're advising companies if they're a company if it's listed we look at its own beta, but recognising that there's wide estimation error around the beta for a single company. We'd also look at a comparator group of companies, typically looking in off-shore markets as well as New Zealand. I heard comments about the discussion that's been in the various Commission documents about qualitative factors and how they affect beta, and I find that interesting material to read and I agree with a lot of the comments that are there.

The big problem I have is when you get to the end of all that I don't think anybody

is capable of making an objective adjustment for those factors. So it makes me cringe a bit if there's a sort of suggestion that there's going to be all this qualitative assessment then you can come up with a different number. I think you really have to stick to the most comparable group of companies that you can find and measure the beta for them objectively and that's the best piece of information that you have.

In terms of the full information approach where you do regression analysis trying to break down the beta by division for companies, that is a very time-consuming exercise in terms of collating the data and undertaking analysis, and the expert report make reference to that and so does the revised draft guidelines. I guess I'm a little bit sort of gun shy about doing that because we've done that once for Telecom, it was a huge amount of work and to be frank we were quite disappointed about the feedback or the buy in from the Commission, there was no debate about any technical aspects and there was very little feedback and effectively it seemed to be ignored, if I can put it that way.

So, you know, it's a good technique but I think if people are going to be using it it needs to be pretty clear that it's going to be taken seriously as a major input to the decision-making process. In terms of the technical side of it, I don't know if you want to cover that but I mean we normally would use five months monthly observations to measure the betas, and we'd use average gearing over the five year period when we delever to get to asset betas. One thing to be aware of, though, if you're doing monthly returns the selection of the day of the month can actually make a difference, so if it's critical we might actually look at running the calculations for each different day of the month to see what the average is, or if there's something funny going on.

In addition another thing to watch for is thin trading and in the straw person example I would see that as potentially being a problem with some of the US companies that are there, so that's something also that arises in the New Zealand context and needs to be checked and there are techniques for addressing that.

MR FLETCHER: Like Unison we tend to rely on the Commission's estimate of beta and we'll tend to update the other parameters within the model, theoretical cost of debt versus our actual cost of debt and use the Commission's beta to compare where we are against the regulatory WACC.

MS BEGG: Thank you.

MR GOODEVE: Much the same as everyone else, we rely quite heavily on the Commerce Commission's decisions at various forums. We have also obtained some external advice

which has also taken into account the Commerce Commission's decision and ended up with numbers very similar.

MS BEGG: Thank you.

MR BALCHIN: I'll quickly summarise the techniques I've applied. There's always a qualitative as well as a quantitative analysis. To take the qualitative first that's the way to establish your sample of comparable firms. You always start hoping you've got enough firms in your local market, which is never the case in Australia and it's probably never the case here.

You'd then establish some criteria that identified industry. For a lines business, I typically look for electricity distributors first then open it up to - and if you get enough firms that meet that criteria, second then you'd stop there; if you don't then you'd open it up to the next most comparable industry which is probably gas distribution, electricity transmission and maybe regulated water utilities as a third.

For airports where I've advised on airport betas I would start with airports, start with the industry first and there are generally enough listed airports around to get a reasonable sample. I don't think there's anything else that's very easily comparable to an airport that I would include in the sector for those.

Once you've developed your sample you go and estimate your beta. How you actually - techniques you actually apply would depend on, to put it crudely, how much the client wants to pay, but the sophistication of the result desired, I've done - there's been a lot of work in Australia in regulatory proceedings on betas and so there's been quite a lot of sophistication applied.

The first step I do is to look at Bloomberg betas using both monthly and weekly drawing observations over different periods of time, five years and beyond. And lever and delever using average levels of gearing over the period. I always express the betas in terms of the target level of gearing because it makes it easier but we can talk about asset betas, it's sort of identical.

In some proceedings where betas have been a focus we've used more sophisticated analyses. We've used techniques to try to adjust for the effects of outliers, both using the MAD method, the minimisation of the absolute deviations, which tends to put less weight on outliers, and re-weighted least squares which is a technique which basically applies a lower rate to observations that are further away from the function.

Normally use econometric tests to test for thin trading and there are tests for that.

I wouldn't normally use a thin trading adjusted beta estimate because betas themselves have a quite imprecise - the well-known thin trading estimates require another one or two parameters which are even less precise. So they tend to just be not worth the effort. Standard errors we'd normally use a robust technique for estimating those in the presence of heteroskedasticity or serial correlation in the error terms.

And the other thing we generally do is to estimate both - look at both the simple average betas for a group of companies, as well as estimating the beta for an equally weighted portfolio of the companies. That should give you a very similar answer. The useful thing is you can then get a standard error for the average of your group.

And that's generally the sort of quantitative side of analysis. Sometimes we make adjustments for going from - for differences in levels of gearing between countries as well as the different effects of the tax which you deal with through the levering equation.

Once you arrive at those, though, sort of one warning I'd give you, it is drawn from my own experience, is that you can't always sort of believe what you see, and even when you get reasonable portfolios of companies, the error of individual betas is such that even the average of a reasonably large portfolio of companies does bounce around quite substantially.

My own experience in Australia in the price review in around 2000 for the Victorian Regulator, at the time of the Draft Decision we had betas, the average of our sample, we had about four or five or six, could have been six firms in the sample, had an average beta of about just over one for a 60% level of gearing and were convinced that both sounded very plausible, similar to what people were using elsewhere; and it seemed to be the right number so we thought we actually know what the beta is, we'll use that. And by the time of the - between the Draft Decision and the Final Decision, which is a period of only about three or four months, that the average of the sample had actually declined from about 1 to about 0.5.

It was a wake up call to me that I mean this is a - the standard error is such that the sort of variation of even the group is very economically meaningful and it's I suppose one of the difficulties of finance generally that, you know, at two very close points in time where nothing seems to have happened the error is such in some of these estimates that estimates can move very substantially. So I think in this process there needs to be some idea of continuity with the past.

In Australia in our electricity legislation that's actually formally in the electricity

rules, that's actually formally embedded in the requirements for the Regulator. For any parameter which the Regulator thinks is subject to uncertainty, which is a funny thing in the finance sector because that really applies to everything, before the Regulator can change the number from what it's been in the past there has to be - I can't remember the exact text, but there has to be substantial reasons or substantial confidence or something like that.

So it's actually a formal embedding of inertia in the process that you basically start with where you were and you vary and you look at how good the evidence is today and whether that is sufficient to make you change your view as to where it was before.

I think particularly in the area of betas that's an extraordinarily useful principle to apply. As I'd said if I'd have been lecturing you at the start of 2000 I would have said go forth, get your market evidence, apply the number and that will give up the truth. Within six months of that I would have said - it's about the time when the rest of my hair fell out and I probably would have lectured you exactly as I do now.

MS BEGG: Thank you. **[Laughter]**

MR COCHRANE: Thank you, Jeff, I won't come in on how much Jeff charges for that advice as well, but I will just add some extra points to this. I think the critical point is to make sure you're comparing comparable business and as part of the analysis that was carried out we started with 14 different businesses, both off-shore and also here in New Zealand which Auckland is the best comparator. We looked at the relative ranking between ourselves and Auckland and then did different weighting ratios between the overseas airports and New Zealand and as a consequence we ended up with a 0.65 asset beta which is what we believe is appropriate for our organisation.

DR MARSDEN: My approach is to estimating beta I think follow the points that Jerry made. First of all look at it from, or consider what I'd call first principles analysis or some fundamental factors that might impact on beta, and the Commerce Commission, at least some of the previous decisions I think have provided very good guidelines there. Also in that exercise I think it's worthwhile trying to also think what is an average asset beta for the market, and in that sort of first principles analysis think where should the firm lie relative to the average asset beta for the market.

In a case where the company in question is listed, clearly you can undertake some empirical analysis using direct estimation of those estimates. In the absence of that I would look at some comparable company analysis of beta estimates. Again just also, and

typically I would take some sort of average of those estimates using both New Zealand and off-shore data, but also looking at if I can get the information on the standard error of the beta estimate in terms of forming a judgment there. And I'll also look at what other sort of comparable publicly available data is on beta estimates in terms of any academic publications or other websites that you can get beta estimates from.

MS BEGG: Thank you.

PROF VAN ZIJL: With an application of the CAPM this is probably the most difficult of the parameters to estimate, and I think we start off with having to recognise that the pure construct, namely the ratio of the co-variants to the variants, both terms depend on the market portfolio, we can't identify the market portfolio, so you can't actually calculate either the numerator or the denominator of the co-efficient, and nevertheless we proceed as if we can, and perhaps often not recognising that if you choose one market index as opposed to another that you'll get a quite different set of beta estimates, that the relationship between those sets is not necessarily monotonic, so that's one level of difficulty.

Whether you are able to make direct estimates in the case of a listed entity or whether you have to resort to use of comparables, you're going to be subject to econometric issues such as should the rates of return be measured daily, weekly, fortnightly, monthly or whatever, over what period should you look at, should it be three years of data, five years of data or one year; what econometric technique should you use? Jeff has mentioned using mean absolute deviation or there's some support for Stein estimators. Irrespective of what empirical methods you use people recognise that estimates are unstable and so for that reason there's often a suggestion made that you should adjust your estimate either by Blume or Vasieck.

If you're going to use comparables you've got the issue of well there are some variables that seem to have an influence on beta, but the problem there is that apart from leverage there isn't much in the way of analytical relationships to guide you, and so that tends to be a bit of an arm waving kind of exercise in terms of saying that for your company of interest the following 20 companies are good comparables, particularly if the companies are from other countries, there are probably all sorts of institutional differences that you're not properly recognising, and often it's also a case of there's a constraint on the size of the job that you're carrying out -

MS BEGG: Can I just stop you there because partly I'd like to know the answer which is what

do you advise your clients, because I think we are quite aware that it's a very -

PROF VAN ZIJL: I'll come to that.

MS BEGG: It's imprecise - you don't need to persuade us I think.

PROF VAN ZIJL: You are constrained by the size of the job that you're actually doing in terms of the research that you do to make sure that you have got a good comparable set, so you can do what I tend to do, which is to either make a direct estimate and/or look at comparables. You end up with a number, but before adopting that number always apply a sanity check, and as Alistair said, start back with the known fact that the average of all equity betas has got to be 1.

If you can get some kind of feel as to what leverage is in the relevant market, and that's not easy either in the sense of do you use book values for equity or do you use market values, work back to say well, what is an average asset beta and how does the company in focus compare with the average company in the economy.

In the case of, say, electricity the Commission has in recent times said that the asset beta is 0.5, the gas beta 0.6. I'm not unhappy with those numbers on the basis really of the sanity check rather than the method that was employed to get there, in the sense that one can argue about the set of comparables that is being used, one can argue about the adjustments that have been made for regulatory differences, for differences in terms of the underlying elasticity of demand, but on the basis of the sanity check those numbers are probably reasonable.

MS BEGG: Thanks.

MR IRELAND: My practical approach to estimating asset beta goes probably in a four stage process, and I think over time you've learned to rely on certain data or certain series, so you get used to the foibles of it, but my basic document is produced each year by Ibbotson, now Morningside. And what they do is under SIC code classifications, just define the business and the chances are that you can produce full information betas.

I have done this for ten years, have the ten books that cost something like $800 a year. So that allows the series to be looked at as it changes over time, so the technology boom distorted the market in certain ways and it does come out in betas. The beauty about Ibbotson it's about industry. Now I'll come back to that in terms of answering the question what might be the asset beta for the lines businesses in a minute.

But the second leg is to look at the Commerce Commission decisions, again having almost read every document since year 2000 again I've become aware of the, what

I would call logic in elegance of the work that's been done, and it provides a very good framework for bottom-up assessment of betas, especially in the New Zealand market. It has quality because of the consultation process that occurs within this forum, it's a public good and I don't know anywhere else in the world that has it. I can go back and find out what Tony van Zijl said about the airports in terms of the price cap way back in year 2000, or Jerry what he said about Air New Zealand on something, so all of that makes people reasonably honest in that process.

So if I now look, and I'll come back to link that decision to the Ibbotson data in a minute, but I also value the PricewaterhouseCoopers contribution, they publish New Zealand equity betas plus related other metrics that go with it, they used to provide asset betas but for some reason took it off the website a few years ago. Love you to put that back on again John, it would make it a lot easier because you've got to guess the gearing. And if they did their gearing in a consistent way it would allow everyone else to reduce errors.

Now in terms of electricity what I did is just, if I could just explain the page briefly because I think it's of tremendous value to you, SIC code 41, the industry, 45 companies and the definition at this high level of SIC code is establishments engaged in generation transmission and/or distribution of electric energy for sale. It then splits the companies up by credit rating, how they're distributed, it looks at the volatility of standard deviation, it looks at size, it looks at capital structure, market, book and five year average, it looks at the operating stats so you can always cross-check your business, it looks at valuation ratios, dividend yields.

And then at the bottom we've got growth rates which are an analysis - I mean polling of analysts so you get the market's feel for valuation, what growth rates are in their mind. It calculates cost of capital, cost of equity with size premium, three factor Fama-French and discounted cashflow stage one, stage three and then divides those up by median, the composite, large composite and small composite, so you've got many ways of cutting and slicing.

Then proceeds to do weighted average cost of capital and last of all right at the bottom corner leverage beta, adjusted beta and unadjusted beta, and you can see, say, in this case that there's no difference between the raw beta and the adjusted beta. So in fact it lines up reasonably well with where Martin is coming from. Now that's split on by median by size and so forth. So you can then get another feel of is it a big one or is it a

small one and so forth.

So when I look at that and then go back to what the Commerce Commission have done and I find aah, in 2005 the decision was 0.4, I don't know where Tony got the 0.5 from. And that's made up of taking the US rate of return adjusting for the control regime of adjustment of 0.1. So I go back to Ibbotson again and I find, let's say we take the median, and for this -

MS BEGG: I might just stop you there and ask you perhaps to put the detail into your cross-submission. I'm just conscious that it would be good to get right around and then just have a quick discussion of the straw man. If you can - yeah, you might just - if you could just truncate it.

MR IRELAND: Yeah, no, no, I mean all I'm doing is bringing it to the table, so you can go and get it tomorrow if you like.

MS BEGG: Yeah.

MR IRELAND: Last thing is the sanity check is, and especially in this utility area, an instance the TSO thing, it's an obvious one. You ask the question if it's 0.2 being the asset beta for this set of circumstances what business risk is left with the company after, when you look at the situation, and that will give you a good sense of whether it's high risk in the low end of it, and I won't tell you what the answer is, but that's it.

MS BEGG: Okay, thank you.

MS COOPER: As you're aware when the airports consult they use the building block model and they apply a WACC, so BARNZ needs to obtain independent expert advice during consultation. And I'd emphasise that it's independent, we don't go to an expert and ask for the lowest possible WACC or asset beta. For the past ten years we've used Professor Bowman for obtaining advice and we find his approach of using first principles direct estimation and comparable companies quite useful. For a non-WACC expert it becomes almost understandable.

Asset beta has been particularly problematic input with the airports. There's been a consistently different outcome from the expert advice which BARNZ has received and that which the airports use. The airports use an asset beta around about 0.6 or 0.65, the outcome for BARNZ on our expert advice is around 0.5.

DR LAYTON: As you would have worked out for the airports I've managed to pass off the job **[laughter]** to avoid it; and indeed in the case of ports and shipping which I have done some work I've managed to pass it off to Garth, so I have been doubly blessed in that

regard. If I have to do something myself I find the PricewaterhouseCoopers report particularly helpful, noting Garth's point. And another thing I find really useful is Martin Lally for the Commerce Commission produced a paper which has about ten factors in it that will affect beta, and after you've done your sort of look at the numbers, then running through that with a sanity check type view in mind is I think quite useful.

MS BEGG: Thank you. Okay, I think we'll move to the straw man - sorry, yeah.

MR FORD: Sorry, just to sort of build on what Kristina was saying. Obviously we use a lot of the work that BARNZ uses in terms of the airport pricing stuff, but in terms of there are other bits and pieces where we're dealing directly with the airports on specific matters, and in that we'll be looking at things like are we entering into a sort of agreement with them, what's the nature of that agreement, how long are we looking at it for and those sorts of things which tends to put it out even further.

MS BEGG: Yeah. From what I've heard I don't think that the approach people are taking is vastly different from what the Commission's applied, but I'll get Russell to perhaps comment on how our approach relates to what other people have said, and then just what issues, any specific issues you might like people to comment on.

MR INGHAM: I suppose it's fair to say in fact we've had a reasonably good outline of sort of the approach in terms of certainly the quantitative. I mean, you know, the fact is that in terms - certainly in the New Zealand context we don't have any pure play businesses, and of the two companies that do have electricity lines of course that are listed, of course they do have other activities, particularly Vector. So therefore we are forced to look elsewhere.

I mean in terms of New Zealand electricity, they were only there I suppose for interest sake, but in terms of shall we say comparability, I mean the point is taken that they clearly aren't electricity lines businesses. So then we looked to other jurisdictions where we have similar or comparable type legal/regulatory regimes to the extent that that's possible, and you'll see that we look to Australia, to the UK and the US.

And I think it's fair to say that even, you know, the point's been made earlier about the paucity of data in Australia, and even when you think about the UK given what's happened in terms of acquisitions of all the EDBs that used to exist there, you know, you're pretty much left with not much. So then really in terms of any comparable companies you end up with the US, but of course again the problem there is you don't really have stand-alone businesses anyway, you have businesses that pretty much are

sub-vertically integrated.

In terms of the mechanics of it the, we adopted the monthly observation over five years. We did look at the betas calculated on a different basis in terms of weekly and daily. I think it's fair to say Jeff's point about what you get out of that process is not surprising, they're all over the place. And also you'll see in terms of things like the standard errors, they're pretty large I think it's fair to say. It's probably not a surprise to anyone.

So I suppose really in terms of the issues, none of this is a surprise to anyone, and I think people have already, I suppose, given a reasonably full assessment of the sorts of issues that they come across when they do this exercise themselves or they do it on behalf of other people.

MS BEGG: Okay, I'll just then ask people if there are any specific comments. We've heard from John he had some specific issues that he's already discussed about using two different data sources and perhaps the overlap that you might get there, and we've obviously heard a lot of detail too about approaches other people have had and the problems raised. But I just - were there specific data issues or the way that we've done it?

MR SMALL: May I just say that finding comparable companies for lines businesses is hard, as has been outlined, and finding comparable companies for point-to-point gas transmission businesses is harder, it's a real problem. Although we agree with the approach, it creates a headache in the methodology every time because there's quite good reasons why a point-to-point gas transmission business isn't publicly listed, it's not a very good stock in a number of ways.

So finding public comparators in that area is particularly hard, unless they're blended firms, either a number of pipelines pulled together into one organisation that happens sometimes, or else they're combined firms, gas and electricity transmission and distribution getting into a broader utility type thing. But that means quite a lot of qualitative adjustment required to go from the industry set back to a business such as Maui.

MS BEGG: Okay, we'd appreciate it if you put in a cross-submission with information that can help us when we come to look at that gas transmission, that will be appreciated. Yeah, Andrew.

MR SHELLEY: Yeah, just one extra point, thinking through the diagram that was circulated by Commissioner Duignan made me think, it's important to ensure that your delevering and

relevering processes are using the same equations. So one of the dangers if you go to picking up published asset betas and then relevering them, is to ensure that you're actually using a consistent model. They may have been delevered using a completely different model than what you're using to relever them. So if you go to published estimates of asset betas you've got to be aware of that.

MR DUIGNAN: Just one comment on that, that would you agree that you delever by the adjustment corresponding to the tax regime of where the company is. Where the company is in the United States there wouldn't be much doubt that you should be using the Classical to convert it to an asset beta. So it wouldn't really be a question of applying the Brennan-Lally adjustment to a US company, so I think it might be a little simpler than you have suggested when you come to Australia and New Zealand if you are delevering there and you're looking at different models, there may be an issue but not as regards a US company, it seems pretty straightforward.

MR SHELLEY: I think that's probably right, but we certainly have used different tax rates when we're delevering different countries to reflect what their effective tax rates are, so it probably comes to the same point.

MR DUIGNAN: That's right, sure.

MR BALCHIN: Actually, can I just butt in there quickly. It's the debt beta assumption that's the most important, the tax rates you should adjust for. But if you use a debt beta, if you assume a zero debt beta in the US and assume a substantial one here you will actually relever back to a number that's quite different to what you started from even abstracting from tax.

MS BEGG: John?

MR REDMAYNE: On the delevering formula outside of taxes there is another argument for using a same formula across all countries, which is that the leverage ratio assumption is assumed constant and a firm value is considered stochastic rather than the firm's leverage amount being constant with constant values of tax deductions relating to that debt. And if you move to the assumption of constant leverage as being the prime assumption rather than constant tax deductions then you'll find the tax term drops out, or there are variations that diminish the effect of that. So there is a different level of issue there about which formula you use.

MS BEGG: Okay, Tony?

PROF VAN ZIJL: Yeah, I just wanted to come back to the suggestion that some people make

of making an adjustment of the Blume or Vasieck kind. I don't employ that at all myself in estimating beta, but I did hear someone the other day make the comment that in the activity of WACC estimation we often in fact end up saying let's just observe what's happening in practise and let's just assume that practise is in fact optimal, if we haven't got a theoretical basis for an alternative approach.

And maybe in fact this type of adjustment deserves more attention than it's had in the processes to date in the sense that of the commercial providers of betas they do provide adjustment betas, people seem to buy these adjusted betas. So maybe there's some underlying rationale to that that I perhaps haven't appreciated probably to date, but maybe we should in fact think about it more seriously.

MS BEGG: Okay, anyone? Yeah.

DR MARSDEN: I'd just like to pick up a point that Commissioner Duignan noted in respect of the beta degearing formula. The beta degearing formula that you use can vary and it depends upon the assumptions you make about the riskiness of the debt tax shield. And in respect of the straw man example it would be perhaps helpful for the Commission to then clarify exactly what beta degearing formulas they have used in deriving particularly the 48 entities of the US electricity companies.

And the reason I ask that is we've just got footnote 19, this is on page 8 of the straw person example, that just appears to use a beta degearing formula with no tax adjustments there. So I think it would be just perhaps helpful to understand that table, particularly where you've got this bundle of 48 electric integrated companies.

And just my other comment then on the straw person example is in terms of deriving this asset beta for the electricity distribution industry between 0.3 and 0.4 is it's not clear to me whether that's just been based on table 3 or has the Commission gone through and done sort of the fundamental analysis in terms of the first sort of principles analysis it's done in the past, given that this beta estimate does appear to be less than what's come out in previous decisions.

MS BEGG: I'm not sure whether you want to comment, Russell, otherwise we can -

MR INGHAM: I suppose for the benefit of Alistair, footnote 24 just highlights that the 0.3, 0.4 is before assessing any further adjustment. It's on the bottom of page 9.

MS BEGG: So it hasn't taken into account the difference in regulatory regimes, is that the footnote?

MR INGHAM: Yeah, and it basically goes on to say the Commission would be interested in

considering proposals for adjustments. It's basically opening it up for you to comment on it.

MR CARVELL: I'm just going to raise the same point that was just raised but particularly in reference to footnote 24. I suppose what I find a bit perplexing about that is the onus or burden of proof being put back on industry to justify that adjustment that's previously been in place in the Commission's analysis to be reinstated. Where first of all I would have expected would be the Commission in effectively changing its position from what was laid out in 2005 and again in 2008 as being their basis for determining a beta for electricity lines companies -

MS BEGG: I'll just stop you there because I don't think that the Commission has changed its position, it's just done this analysis to this point really rather than having made a conscious decision to not make that adjustment.

MR CARVELL: I infer from footnote 24 it has made a decision and in fact it's now seeking arguments from submitters as to why it should shift back, that's how I interpret footnote 24.

MS BEGG: The regulatory regime's changed, so we will need to revisit the issue, but a decision needs to be made on that.

MR CARVELL: Perhaps then the shortcoming in the straw person example is that it doesn't canvass that.

MS BEGG: True, yeah, fair point. Brent?

DR LAYTON: In table 3 in the straw person Contact Energy and TrustPower are included. They clearly have numbers that are out of line with the others on the table. They're also in a quite different sector than generators and retailers in electricity lines businesses, not subject to the same regulatory regime. I think their inclusion is in fact inappropriate, and if you take them out and just looking at those numbers they're the ones that tend to be pushing it up.

MS BEGG: One of the difficulties with getting comparable companies, yeah. I think obviously you're going to be invited - you are invited to put comments in cross-submission, I think that's been very useful thanks. And we've just got one topic which Pat's going to talk to, which is the investor tax rate.

DR LALLY: Can I just check something here, the numbers in table 3 are generated using a maximum of five years of data?

MR INGHAM: Yes.

DR LALLY: I'd like to just refer to comments that have been made by a couple of presenters. I think Jeff Balchin referred to an experience he had with adding a few months extra data led to the beta estimates coming down appreciably, and I think John Redmayne you referred to experiences when using the first day of the month rather than the 15th or the last day of the month produced materially different beta numbers.

I think those two experiences are ones that my own experiences leave me unsurprised with. The experience I've had with these things is that if you use the same period of time and draw on pretty much the same set of companies but you get the numbers from, let us say, Bloomberg or from Ibbotson or S&P there are significant differences in the results and there are a variety of possible reasons for that, but perhaps Bloomberg use the same day of the month and S&P used the last day of the month.

So I think that illustrates the need to, in so far as you are looking to proprietary suppliers of these numbers, to canvass a range of suppliers. Alternatively if you are doing them yourself to generate the numbers using a variety of processes that would correspond to differences across proprietary suppliers.

In respect of Jeff Balchin's experience with an extra few months data, a point that the panel has stressed is the merits of looking at estimates possibly over five years but doing it over a succession of five year periods, and my experience with the electricity lines, the electricity utilities in the US is that if you do look at these essentially the same group of firms over a succession of five year periods, the numbers are sometimes substantially different, and it seems well appreciated that in the period from about 97 to 2002 the numbers drop sharply and then they came up again.

So if you did take just the last five years of data and you happen to be doing it in 2002 you'd have got appreciably different numbers to those that would arise if you'd done the exercise today or you'd done the exercise in 1995. So my suggestion to the Commission would be to use longer periods than five years, and also to look at the results from a range of proprietary suppliers if that's where you're getting them from, because there are noticeable differences across suppliers, possibly due to the kinds of things that John Redmayne referred to.

MR BALCHIN: I'd like to agree with what Martin said. The standard practise in Australia now is actually to omit that whole period associated with the tech bubble. We generally present rolling betas over about a five year period but also look at the betas at a point in time estimated over a longer period. That's sort of doubling up on your information to

some extent but it provides a fuller picture.

In terms of proprietary suppliers I'd tend away from them now because there's always something you never fully understand about what they do, and estimating betas is not that hard that you can't do it yourself. With that comes an expectation on the Commission's part I'd expect that any expert would make that fully available to be critiqued, I think that's something everyone would be happy with.

PROF VAN ZIJL: To some extent I think you can draw an analogy between other measuring operations and beta in the sense that if I wanted to measure the length of the table I'd use a ruler or a tape that gave me the same measurement irrespective of how hard I stretched it, but with measuring beta it's like measuring something with a rubber band, the answer you get depends on how hard you pull it. And the strength of the pull reflects things like your choice of interval, your choice of period, your choice of econometric technique, your choice of conversion formulas and so on. So for that reason I think the sanity check at the end is all important with beta.

MS BEGG: Thank you, yeah, that makes sense.

MR DUIGNAN: We're now turning just to the last parameter which we have described as the investor tax rate. Clearly our modelling and assessments also involve the corporate tax rate. The reason for focusing upon the issue in terms of the investor tax rate is the obvious point that we feel the corporate tax rate is - the statutory rate is clearly defined in New Zealand. I quickly should add, though, that as discussed in the cost of capital revised draft guidelines on page 49 but discussed much more extensively in the Input Methodologies Discussion Paper, our treatment of the corporate tax and therefore of the interest rate shield and a host of other matters is dealt with in the sense of the cashflow. So that if you look at the input methodologies we discuss the choice between the tax expense and the tax payable approach where clearly the tax payable approach implies that the corporate tax is being dealt with in the cashflows rather than directly in the cost of capital expression, although the tax rates are appearing in the cost of equity calculation.

I hope that explanation isn't too complicated, but if you look at the two documents you will, I think, fully appreciate what I've spoken of and I expect many of the experts are quite possibly more familiar with this point than I myself.

The issue then that I'd just really like to have a quick discussion on, because we believe that there is agreement, is the simplification that we adopt a view that the appropriate number to use for the investor tax rate is to set it in practise at the current time

equal to the corporate tax rate of 30%. In some sense it's an empirical question which clearly relates to the current configuration of the tax system which as we know has had a number of downward adjustments following the last election, but nevertheless has both higher and lower personal marginal tax rates, 39 and one lower again.

So without further ado, particularly focusing I think on the experts but also any company representatives we would like to just canvass views.

DR LAYTON: Happy with the 30%, conceptually one's thinking about the price setting investors and so I think there is some grounds for arguing for 30% in that case.

PROF VAN ZIJL: Until these changes we used to be happy enough to assume that the rates of 39 and 33 maximum led to a reasonable assumption that the investor tax rate was 33. I don't see a big departure from that in assuming that the 38 has travelled down to 30 with the drop in the company rate. Again it reflects some ignorance of what the real rate is.

I believe PwC have made some attempts to measure the investor tax rate. I think in the version of the CAPM that you've applied you've actually given explicit recognition to that. But most people are happy to assume that the two rates are the same. Of course it makes a difference in your conversion formulas, if you assume that they're not equal.

DR MARSDEN: I'd recommend using the 30% as a way to make sure that you come to a simplified form of the model equal to the corporate tax rate.

MR BALCHIN: On this one I'll defer to my local colleague John, I can give you chapter and verse about the trials and tribulations of our gama in Australia, but I think it's less relevant to your needs.

MR REDMAYNE: When the corporate tax rate was 33% we were using an investor tax rate of 28 and that was - as Tony said we'd done some analysis looking at the investor mix in the market, the tax rates they faced on income capital gains and the utilisation they could make of imputation credits, and we followed through the Brennan-Lally formula for those things and came up with an estimate of 28%. But with the drop in the corporate tax rate and some changes to the taxation of New Zealand institutions I think the Commission's current position of using 30% is reasonable.

MR DUIGNAN: Thank you, interested to ensure we've canvassed all views.

MR SHELLEY: I've got nothing extra to add.

PROF BOWMAN: Likewise.

MR DUIGNAN: Could I ask Russell or Martin as to whether they -

MR INGHAM: Yeah, 30% sounds plausible to me.

DR LALLY: One of the recent changes that we have seen in New Zealand's tax regime is this high tax regime, which for investors who choose to invest through one of these schemes caps their rate at 30%. Now the extent to which investors are accessing these high schemes it seems to be substantial. I don't know just how close it is to 100%.

In so far as all investors are going through PIEs then 30% would be the upper bound on your estimate. But the 30% rate for investors in such schemes would arise from people whose marginal tax rates would otherwise be the 38 or the 33, and it seems reasonable to suppose that people on those sort of marginal tax rates are probably responsible for the great bulk of investment into financial assets in New Zealand.

So on that basis with the PIE regime in force, 30% seems the natural choice regardless of whether it aligns with the corporate tax rate. The fact that it does align with the corporate tax rate is a happy coincidence.

MR DUIGNAN: Thank you. I could just ask, John Redmayne may be able to clarify that whether or not under the PIE regime in fact you can get your, I mean if you're a lower rate tax payer your rate is reduced down to that level.

MR REDMAYNE: I'm not an expert on PIE tax but my understanding what Martin said is correct, you cap the tax on income at 30%. But there's also been a change to the way institutions are taxed on trading domestic shares, capital gains are now explicitly tax free, so that has also had an effect which attempts to drive you towards the investor tax rate being 30%.

DR LALLY: I should then just clarify something here that John, I believe the number that you referred to of 28 is a number that takes account of both the ordinary tax rate on interest and any capital gains tax to which you're exposed, whereas in the simplified Brennan-Lally model, whether you agree with it or not, the tax rate that you are looking at is just on your ordinary tax rate on interest, it assumes the capital gains tax rate is zero, whether you agree with that or not. And of course under the PIE regime with institutions who have gone down that route no longer being subject to capital gains tax, it would make the assumption of a zero capital gains tax rate even more reasonable in this model than would otherwise have been the case.

On the specific question you've raised, Pat, my understanding is that if your tax rate before going into a PIE scheme is something less than 30% you will continue to enjoy the lower rate. So the effect of the scheme is to take people on 33 and 38 and bring them down to 30.

MR DUIGNAN: Thank you. I think I hand back to the Chair at this point.

CHAIR: That's a convenient time, we're still on track for the timetable today, it's gone very well. So we'll break now for afternoon tea and come back at 4 o'clock for our last session, thank you.

Adjournment from 3.27 pm to 3.55 pm

CHAIR: We're actually a spot early but we all have an incentive to get this underway being the last session for one hour. I should just note for the record that Commissioner Taylor has another engagement that's unavoidable so he will miss this last session but will peruse the transcript of the hearing for this session so that he will take that into account. Okay, we'll now turn to the last session today on estimating the cost of capital and Commissioner Duignan is going to lead this discussion.

ESTIMATING THE COST OF CAPITAL

MR DUIGNAN: Thank you Chairman. The first aspect that I'd like to do in order to make sure we have an informed discussion is just to note a couple of aspects regarding the history and then I think it would be useful so the discussion is informed if we just have a quick refresher on the methodology that the Commission has used to derive the range, and for that purpose I will ask Martin Lally to describe that. It's probably the case that he is most familiar with that of the people attending.

And then we will discuss the issue of the range and the issue of whereabouts on the range one chooses to adopt an estimate. Essentially these are two different topics but I kind of am happy to cover both, although I would ask that you perhaps deal with the question of the range and then sort of separately rather than completely blurring them. We'll have, in a moment, the description based upon the revised draft guidelines of the procedure that is outlined there.

I just wanted to note that the other references that the Commission has made to its choice in the past are that in the Input Methodologies Discussion Paper the Commission stated it considered a main practise to reduce the impact of any uncompensated asymmetric or unsystematic risks by choosing a WACC that is above the midpoint of the range.

And in the gas authorisation, in calculating the overall WACC the 75th percentile of the WACC distribution was adopted. The Commission noted concerns about the asymmetric nature of errors. It was reasoned this provided an appropriate balance, that is the 75%, between achieving normal rates of return that could be considered commercially realistic for comparable businesses and the interests of the acquirers of the controlled service.

In the Gas Control Inquiry the 50 percentile was used and then in the Airports Inquiry there were of course ranges for the different airports and something above the 50% level was adopted. I did want to stress that the gas authorisation is an example of past practise rather than something that the Commission regards as having set a level that it's sort of established a precedent with, so we are open on this issue.

I now would ask if Martin could just describe the process. The reason for doing it this way is simply that unlike issues of beta and the market risk premia that everybody deals with every day of the week among the experts this particular matter, it's fair to say that there's a specific procedure that has been used in the past and so it seems worthwhile to briefly outline that. Martin could you do that for us please?

DR LALLY: Thanks. The procedure is described in writing in the revised draft guidelines on page 51. And five steps are referred to there; I'll just briefly describe them.

The first step is to generate point estimates for each of the WACC parameters. A point estimate for the market risk premium, the point estimate for the asset beta and so forth. And in recognition of the fact that the true values are not known and could be more or less than the point estimates, that's recognised by constructing a probability distribution around the point estimate and as a measure of the spread in that probability distribution the standard deviation is used.

The standard deviation is arrived at by consideration of the variability in the underlying data that gives rise to each of the point estimates, and the particular processes vary somewhat across the individual parameters. But it's worthwhile mentioning that in respect of the asset beta one is recognising not simply that the point estimate as an estimate for the industry in question could be wrong, so you might be estimating the asset beta for industry X at 0.3 and the true industry beta, that is the average of firms in the industry, could be more or less than 0.3, but in addition any individual firm could have an asset beta that varied from the industry average. So both sources of variation are recognised in the standard deviation for the asset beta.

The second step is to take the point estimates for each of the parameters, for example 7% for the market risk premium, for example 0.5 for the asset beta and to put them into the WACC formula to come up with the point estimate on WACC.

Now because the point estimates for the individual parameters may be wrong, then the point estimate for WACC may be wrong and the true value may be more or less than that. So we're interested in a probability distribution around the point estimate for WACC. And again, as a measure of spread in that probability distribution we take the standard deviation. And that standard deviation for the WACC distribution, that measure of spread, reflects the standard deviations for the individual underlying parameters.

But the nature of the relationship also depends upon the extent of correlation in errors. Your WACC point estimate may be too high or too low. Your point estimate for the asset beta may be too high or too low. Are these errors correlated? If you take the view that they are positively correlated then there will be much more spread in the WACC distribution than if you took the view that they were uncorrelated. My personal view about the correlation is that I think it's close to zero and that's a working assumption that I've used in my own work, but I understand that there are different views on that question.

Nevertheless, if you do believe the correlations to be zero, it's quite simple to translate from the standard deviations of the individual parameter estimates through to the standard deviation of the whole WACC distribution. And having generated this point estimate for the WACC distribution and the standard deviation, in order to select a point in the distribution such as the 75th percentile, you need to make some assumption about the shape of the probability distribution. And one possible assumption to make is that the probability distribution is normal in the statistical sense, and if you do that you can then determine the 75th percentile, or whatever percentile you're interested in.

Now of course there are different sorts of probability distributions you could assume. Clearly the WACC number can't be negative. The true WACC number can't be negative so you might want to use a probability distribution that was consistent with that view, which would mean a choice other than the normal distribution such as log normal.

But my work for the Commission suggests that in the kind of region that you would be interested in, I think you would be interested in, from about the 50th to about the 90th percentile, that it doesn't make a great deal of difference to the number, the WACC number you choose whether you use the normal distribution or some distribution

that's slightly different such as the log normal.

MR DUIGNAN: Thank you. So I now essentially invite the experts but also company representatives to the extent they have a view to advise us essentially on their views on the procedure. In fact if I just briefly mention the aspects that strike me as being potentially worth commenting on, there's the overall procedure of course. I should stress that the Commission is looking for something that is transparent and that is a criteria that leads us into the sort of approach that's been outlined, although the Commission in input methodologies is yet to determine whether it will continue with this.

There's the question of correlation, which is being assumed to be approximately zero. There's the question of the distribution, it should be noted that the use of the normal distribution as opposed to a log normal is, shall we say, if any bias results it is an upward bias as a result of that, as I think you will appreciate. And so I would be interested to hear views about the procedure at this stage and then perhaps we'll move on to the issue of whereabouts on the distribution one might choose.

Finally, if you are able to offer insights into your practise that it's fair to say makes the comments that are offered more meaningful in terms of indicating that they relate to something that is in practise in your advice. So I think once again we will start on this side.

DR LAYTON: Thank you. I'm happy with the Commission's general approach to getting the range. I'm happy with it being described as a plausible band, and I'm happy with the Commission's view that they shouldn't employ Monte Carlo methods.

MR HOOGLAND: I don't have any problems with the approach, I think one of the things that's been evident over the last couple of days is there's a high degree of uncertainty about, not only the value of the various parameters, but also the methodology used to calculate those parameters. And to some extent I think to then go and assume a distribution and calculate sort of standard deviations only exacerbates that uncertainty.

So I'm not sure that at the end of the day when you get a plausible range that it's statistically valid to say we'll pick a number at the 80 percentile and that means there's an 80% chance that we're above what the true WACC is. I don't disagree with selecting a number towards the top end of the range, but don't believe that there's the degree of precision there that is suggested by picking a 75 percentile or 85 percentile number.

MR DUIGNAN: Thank you. Could I interpret that as suggesting that you're happy with it viewed as a procedure but it would be that the description of the procedure should qualify

it to say based on the assumptions rather than to - and that the Commission should avoid kind of assertions that it had identified the 50 percentile in the real world, or fully. It's a matter of description of the procedure perhaps rather than whether to undertake it.

MR HOOGLAND: Yes, I think that's right. Essentially what I'm saying is that if you pick a point in the upper band you're picking a point in the upper band, you're not necessarily picking a statistically valid 75 percentile.

MR DUIGNAN: Thank you, if I might just briefly add of course, there was the question of Monte Carlo simulation techniques as an aspect of the methodology, so please do comment on that if you so wish. So if we proceed on.

PROF VAN ZIJL: Two issues, one is to form the range and the other is to pick a point on the range. In terms of forming the range we start off with intervals for each of the parameters. In some cases we've got some statistical basis for the intervals for each of the parameters, but in other cases it's just basically sort of informal judgment. So if you recognise the somewhat unsophisticated nature, if you like, of those starting intervals, one way of combining them would simply be to sort of take all the minimums and combine those, take all the maximums and you'll then get a combined interval which would be a lot larger than the interval that has been obtained by the method that Martin Lally has employed.

As an alternative to what Martin has done in terms of assuming zero correlations, you could of course specify the nature of the distributions of each of the parameters, and use Stein's Lemma in terms of finding out what the expected values of the products are. But that's quite complex and an alternative would be to use Monte Carlo analysis, and thereby you could in fact explicitly state what you see as being the cross relationships among the parameters.

You could also recognise the different nature of the probability distributions associated with each of the parameters. Whether it's all worthwhile doing I don't know, maybe it's an advance on the very simple approach of simply combining all the minimums, combining all the maximums. Whether it's a big advance on what Martin has done I don't know either, but I don't think it's something worthwhile trying just to see what the difference might be in terms of the overall result.

Then in terms of the point on a range, I have some trouble with the interpretation that's placed on the results of obtaining a range, in that if we think of some underlying statistical procedure then what we've got is we've got one interval estimate for a

population parameter that we don't know what it actually is. And so we've gone through this exercise once and we've got one value for that interval. Presumably we're saying that if we'd gone through it again we might have got a different interval.

And so we have in principle a set of intervals which will average out to the true underlying parameter, but we're not actually doing the exercise many many times, we're only doing it once. So all we've got is one interval estimate. We have no idea whatsoever as to whether that interval estimate is correct or incorrect in terms of including the true WACC, all we know is that if the distributions are normal and it's probably reasonable to assume that the distribution of the estimator is normal, then if you're using, say, two standard deviations then 95% of the time your procedure would have led you to a correct statement, 5% of the time to an incorrect establishment.

You can't go from there talking about the probability of the parameter being greater than or less than a certain point. When we talk about this 75th percentile calculated in the way that the Commission has done in the past, all that's happened is that you've got a point estimate for the 75th percentile on the distribution of the estimator. The true parameter that you're trying to estimate is a single point, it doesn't vary, it's equal to 0.8 or it's equal to 0.9 or 0.15, it has a single value.

What varies are the values of the estimator, and so if you in fact want to pick something like the 75th percentile or the 90th percentile you in fact need to construct a confidence interval for that percentile, and that confidence interval will be something wider again than the interval estimate that you made on the basis of your estimation of each of the parameters. I've set this out about two years ago in a paper that I prepared for Vector so the Commission has this paper.

In terms of the procedure of picking a particular point on the distribution of the estimator, I think the Commission also needs to give some thought as to why would you select the 75th percentile or the 90th percentile or the 60th percentile or whatever. Clearly that must relate to the cost of being wrong in the sense of being too low versus the cost of being wrong in the sense of being too high. So in other words there must be some sort of loss function that would lead you to pick the 75th percentile as opposed to some other point on that distribution.

Now clearly there are different kinds of loss functions that one could postulate, but a simple linear loss function would, for example, say that the cost of being too low is three times the cost of being too high, which is equivalent to a 75th percentile. If it was

90% the ratio would be 6. At least by thinking about it in that way you'll have a more logical basis for choosing a particular percentile as opposed to some other percentile.

MR DUIGNAN: Thank you very much, and personally I'll be interested to re-examine that paper that you speak of. I would just ask in any submission that where submissions are proposing Monte Carlo methods there's two possibilities it seems to me, there are no doubt more, but one is simply using them to just test any non-linearities in the way the WACC formula works so that you're just taking a random sample completely.

The other would be where you'd imposed correlation constraints between the variables, and clearly you could then do Monte Carlo, but that is a dramatically more larger and more difficult but equally more interesting exercise. I think we would need to be clear which it is, because they're kind of dramatically different, the simple Monte Carlo is testing whether there's linearity issues, whereas say the other one where you've introduced the correlations is going much further, so just -

PROF VAN ZIJL: The problem, of course, arises you're multiplying some of the parameters. If you were just adding all the parameters then you could just add up all the expected values, but you're taking products so you then need to get into well are these things in fact correlated or are they independent? And Martin has to date assumed that they're independent in the sense of correlation being zero, but one could, in the case of some of the parameters, put forward a reasonable argument for saying well maybe the correlation is not zero.

But beyond that I think Monte Carlo would have the advantage that you could also start making some explicit assumptions about what the nature of the distributions are as opposed to assuming that the distributions are such that when we sample that the sampling distribution of the estimator will be normal. But that's often not an unreasonable assumption.

MR DUIGNAN: Thank you.

DR MARSDEN: Just a couple of comments to start, I think in terms of selecting a cost of capital range it needs to be clear what adjustment, if any, is made for asymmetric risk that's not reflected in the cashflows, and what is the estimate that reflects this so-called asymmetry of social consequences.

And I guess just focusing on then the issue in hand we seem to be just here getting some confidence intervals in respect of some errors in the parameters. Assuming of course that this model holds. I think it might actually be useful to do some Monte Carlo

simulation study really just to provide a check at least for one industry or one set of circumstances to say well what is the impact if some of these distributions are not normal, and also to potentially test the assumption that Dr Lally has made of zero correlations.

For instance we talked a little bit of discussion about the market risk premium noting that debt premiums have gone up and therefore why hadn't the market risk premium also gone up, and I accept Martin's comments there, but you might still expect that they would be positively correlated. So one study, I think, to just test or look at different distributions, different correlations and see are the results substantially different, given the sort of more analytical procedure that's proposed in the guidelines.

And just my last comment, yes, I would also perhaps just share a comment, or to say that I would be cautious about saying that this analysis suggests a high degree of preciseness in terms of this arrangement.

MR DUIGNAN: Thank you, just there's one aspect there that might be misinterpreted. In order to test the correlations you would need additional data. The Monte Carlo doesn't of course, as I'm sure we're agreed, test the correlations just by running the Monte Carlo without having provided, or imposed on the Monte Carlo process a correlation assumption, we're in agreement on that I think.

DR MARSDEN: Yeah, I think you need to build in the fact that if you do draws they are correlated. But it's just really to say, you know, I'm not saying that I necessarily know the correlation but if the correlation between the debt premium and the market risk premium was 0.3 or 0.4 what impact does that have on the underlying range distribution they come out with.

PROF VAN ZIJL: Can I just clarify the comments I made earlier. That is what I was speaking about there was simply parameter error. Model error I think is another category that you need to adjust for separately. So the estimation of a range and a point on that range, that's to do with parameter error; whereas model error, which we talked about extensively yesterday, is a different category for adjustment.

MR DUIGNAN: Thank you.

MR BALCHIN: I hope I'm not going to, well, what I say might mark a divide between practitioners and maybe some of the academics who practise in this area, but the first comment I'd like to make is I think it is an important and welcome acknowledgment of the Commission that there is an asymmetric consequence of getting things wrong. So as a starting point I think that's a good place to start from. It took us a while to get there in

Australia, so you guys have certainly got there a lot quicker than we have.

In terms of taking the next step in doing something with it, this is very hard. Measuring, actually trying to measure the degree of asymmetry in this loss function is very difficult. I've never seen a study that's actually tried to do it and I can't actually think of an easy way to do it, maybe someone will one day. And even implementing, trying to get a handle on the probability distribution of a WACC, as Martin has done, on the assumption that the CAPM holds is quite difficult. Measuring the means, or the first moments of these parameters is quite hard, measuring the spreads or the second moments I think is even harder, particularly where you're drawing data from multiple sources, so you can't use standard techniques of putting together standard deviations.

In my view what Martin has done is - I actually think it's quite a reasonable approach, and I think the approach that Martin's applied, Dr Lally's applied in the past here is a whole lot better than what we've done in Australia, it's a whole lot more transparent and it's certainly a more, I suppose, logical way of putting together what you do know about the spreads of different parameters.

His assumption about correlations, that things are uncorrelated, I think that's probably a reasonable assumption given the degree of precision in this process. I think there are some things that may well be positively correlated, people have talked about the market risk premium and the debt premium which is probably right.

We also know that the debt risk premium and the risk-free rate are probably negatively correlated, so I'm not sure on balance if you looked at everything in total that you would actually change your answer much anyway. And from what I recall from gas, the results were actually driven fairly heavily by the asset beta spread anyway, and I can't think why that would be strongly correlated with anything. So I think once you try to build you a better rocket you may not find it flies much better in any event.

Regarding Monte Carlo simulations, they're very useful in the situations where they're useful, which is where you can't solve probability distributions in close form, or where your maths isn't sufficient to do so. That's certainly not a criticism that can be levelled at Martin. So, I don't think there's actually a need for, given my view that it's reasonable to assume for the purposes of this that the spreads are uncorrelated, I don't think there's actually need to embark on that exercise.

One thing that we need to understand is that this is parameter error within the CAPM. We've also talked previously about model error as being another area of

uncertainty that we need to understand, and I think we'll probably get into that later on.

MR REDMAYNE: I think the work that Martin's done is quite good to advance this area of thinking. However it is based on several simplifying assumptions which I guess are necessary if you want to end up being able to apply a sort of closed formula solution to the problem. If you look back at some of the simplifying assumptions, though, one of them is, my understanding is that each of the parameters that you're estimating has a normal distribution, and a second one, key one is the zero correlations. A number of these parameters will not have normal distributions, at the least they'll be truncated at the downside. For example you wouldn't expect a market risk premium to be less than zero, wouldn't expect the interest rate to be less than zero, leverage is bounded between zero and 100% and so forth.

So once you allow for that and some of these things, even with those truncations or boundaries, they may not necessarily be normal distributions between those boundaries. So once you allow for that and the possibility of non-zero correlation, and I think there's been two possibilities put forward which I agree would make some sense and that's a positive correlation between a market risk premium and the debt premium and the possibility of a negative correlation between the risk-free rate and a market risk premium.

If you want to incorporate those things I think the only practical tool to do that is Monte Carlo simulation, and I don't think you should shy away from that as being sort of, you know, overly complicated, because if you try to solve a more complex specification, there's a problem with formula approach, one of the submitters I think has said he'd run to several pages and basically no-one would understand it.

If you are assuming partial correlations it does complicate Monte Carlo simulation. It need not complicate it overly if it's a fairly simple correlation structure, assumed, for example, that there is one primary driver of the partial correlations which might be the market risk premium. If everything has either zero correlations or partial correlations to that it is reasonably tractable to build a Monte Carlo simulation for that problem.

The other point, as has been made by some people, that what's being discussed here is parameter risk, there is also model risk, and I guess there is a possibility of incorporating that in the analysis if you assign some probabilities to the use of other models and populate those with inputs, or alternatively you treat that as something over and above the generation list distribution.

One further comment, what we do in practise which might interest you. Not surprisingly none of our clients is really wanting to pay us to do this kind of stuff. So in terms of looking at ranges we would tend to - we quite often express the cost of capital as a range rather than a point estimate, but it might be based on a high and low beta, for example, being the main driver of that.

MR DUIGNAN: Thank you, could I just, just to make it quite concrete that whereas the correlation matter has uncertain effects, that the truncation of the distribution, or rather the use of a normal distribution when we know that the actual distribution must be truncated at zero, would tend, on the face of it, to mean that the procedure we've described is over rather than under estimating, am I correct on that or incorrect? Martin please.

DR LALLY: First of all could I just comment on the subject of individual parameters. There is no assumption about the distribution for individual parameters. You generate a point estimate and a standard deviation for each individual parameter. You don't need an assumption about the shape of the distribution to generate the point estimate and the standard deviation for WACC. What you do need, once you've got a point estimate and a standard deviation for WACC, what you do need is a probability distribution on WACC. And if you use a normal probability distribution you get a different shape to a log normal probability distribution, which would truncate at zero.

Now if you lay a normal distribution over a log normal distribution with the same mean and standard deviation, what you find is that at some points the cumulative probability for the normal distribution is running ahead of the log normal, but eventually it gets overtaken by the log normal. And that cross-over point, well, it might be below the 80th percentile, it might be above it, you can't definitely state without specifying what your percentile that you're interested in is, and what your parameters, your mean and standard deviation for the distributions are, you cannot state without those things which of these two probability distributions will provide you with the larger number.

But what you can say is that comparing the results of a variety of probability distributions over what I think is the relevant range from about the 50th to the 90th percentile, the differences in outcomes are very very small.

MR DUIGNAN: Thank you, okay, that's very helpful.

MR REDMAYNE: Yeah, I disagree with Martin, I think that the shape of the underlying distribution of the parameters, particularly if they're truncated, will have some effect on

the shape and form of the distribution of the resulting WACC. I suspect Martin is perhaps referring to the possibility of combining a large number of variables that when you do that the resulting figure will assume a normal distribution, but I don't know that we could assume that in this case.

MR DUIGNAN: What I think is the appropriate course of action here is that you might like to just look at the point in your submission and no doubt Martin will have a look at it in other forums. Graeme.

MR GUTHRIE: I think the way the discussion has gone half way around this table brings me back to what I was thinking early yesterday morning, when I talked about how I felt the Commission's role is to estimate the market determined cost of capital and that it seems to go down the wrong road of too often trying to estimate the cost of capital that's predicted by a particular model.

And that's exactly where we are now. We're not talking about model error, we're not talking about the uncertainty in the estimate of this as an estimate of market determined cost of capital, we're looking at parameter error and seeing how precise this number is as an estimate of what a particular version of the CAPM says that it should be. And again that's an interesting intellectual exercise, but it's not the question that the Commission I think should be asking.

I mean you come later on to ask whereabouts in this range should you choose a point, because of the way you're setting up this range you're not actually choosing it within the range of possible values of the market determined cost of capital, you're choosing it within a range of what you think a particular model says that should be.

And I think that means that you're going to dramatically underestimate the true uncertainty around that parameter as an estimate of the market determined cost of capital. And if you really think there are asymmetric costs with getting it too high or too low it's really important that you understand just how imprecise your estimates really are.

I think the main criticism I've had of the Commission's work in this area for a few years is that I think the Commission has been overly optimistic about its ability to estimate the market determined cost of capital precisely. So I just make that point at the beginning.

But as long as we're talking about estimating the predicted WACC from a particular model, that is parameter error, I think it's important to remember that this whole process isn't being carried out by robots, it's being carried out by individual analysts and I

think that's a key driver of correlation. I know that the experts in this room aren't exactly a representative sample of aware finance practitioners, but if you asked everybody in this room what they thought the market risk premium was and you asked them what they thought a lines business's asset beta was and you drew a little scatterplot I'm guessing that the people who think that the market risk premium is relatively high are also going to be those who think that the asset beta is relatively high.

And you could go through all of those parameters and I think as long as it's individual analysts doing this analysis, that is the source of correlation. And I'd suggest it's - well, I think that's an important consideration. Especially when you go through and you look at all of the judgment calls that are made when you go down this list.

How many different ways are there to estimate the market risk premium? You might have half a dozen different numbers, you've got to take those different numbers and come up with one estimate that you put into the CAPM. And everybody confronted with the same data is potentially going to come up with different estimates.

The same problem comes up with when you talk about the asset beta and it's not a robot making this decision. I'm going to go through and probably think the market risk premium is towards the high end of that selection and I'm probably going to think the same thing about the asset beta and there's your source of correlation. So I think it's a really, again overly optimistic assumption to say that the correlations between these individual parameter estimates is zero, I don't buy that for a minute.

The second point I'd make is that this isn't science. I think you can estimate the market risk premium scientifically, you can estimate the asset beta scientifically; to estimate the precision around the ultimate WACC estimate isn't science, and we keep on - we've talked about the 75th percentile, the 90th percentile, that's the language you use when you've got an objectively estimated scientific measure of the distribution. We haven't got that, we've got a series of subjective calls all the way through that are unavoidable and we get this range, and there's this impression that it's science, and that it's reliable.

And I think it's even without the model error, which is the real problem here, I think it can get back to what I've complained about before, which is the Commission's over-optimism regarding the precision of its estimates.

MR DUIGNAN: Could I just intervene there just to ask that, I mean we are working in the context of Part 4 of the Commerce Act and so in a sense the requirement on the

Commission is to specify how it goes about the procedure. There's the issue of how it then describes that, which you've, you know, quite reasonably suggested that the language and the terminology being used gives perhaps an incorrect impression regarding what can be done and what should be interpreted.

But I think it is most useful to us if we distinguish between a suggestion that the procedure in terms of the steps should be abandoned in which case some other procedure would be required, or whether you are essentially quite concerned about the misinterpretation of what that procedure does. The distinction is very important given our job and it is our legal requirement is to come up with a description of how we're going to get to a number, and we don't have the luxury of deciding that we can't get there or of giving a range.

MR GUTHRIE: I think one of those factors leads into the other. I think that the presentation of it as science effects the way that you ultimately come up with a number. For example, if you are going to choose a range and then go start at the middle and go half way towards the upper limit the answer that you eventually get to is going to depend not just on where you start but on where that upper limit is.

And if you're really doing it because you're concerned about the asymmetric costs of getting a too high versus too low, then it's important that you know what too high represents. And I think because of the language and because of the discussion we're even having here today, you look at that top number and think well it can't be higher than that. And I think it probably can be higher than that.

So really what I'm saying is I think the Commission needs to be less optimistic about that range, it might want to choose a larger range, and given that this really isn't science, I can't help thinking that the all minimum and the all maximum possibility that Tony talked about might not be a bad way to go. It is very, well, it's transparent, it's a fairly blunt instrument, but I think it's actually perhaps a bit more honest.

You know that when you just take all the maximums that it really is a worst-case - well, you hope it's a worst-case scenario. You can't fall into the trap of being overly optimistic about your precision. So I think if you -

MR DUIGNAN: Could I just lead you back to, you know, we have a Purpose Statement, it is the long-term interest of customers, or consumers, that is what we have to base it on. So if you are submitting on the point of taking the minimums and the maximums it would need to be linked to that statement as opposed to some other criteria. The asymmetric risk

criteria has to be subordinated to the overall thing and linked to it.

MR GUTHRIE: All I'm talking about is how you calculate the upper limit of that, or the width of that band. And I think that the way that it's been done in the past is too optimistic. I think it should be wider, I think that's because it's not realistic to just assume that the correlations are zero. I think if you want transparency it's important that you don't give a misleading impression of the science. So I would say taking all the maxima is a reasonable way to approach it. It's transparent, I don't think it over-represents the science behind what you're doing, and it's just an alternative method for doing what you're doing now.

Perhaps the only other thing I'd say is I don't really understand why Monte Carlo - I can understand why people might not want to do Monte Carlo simulation because maybe it's not worth the trouble, but really it's not difficult, we'd give it to our students to do as an assignment. So I don't think the Commission should shy away from - if it thinks it's a good idea it shouldn't not do it because it thinks it's going to be too difficult, it's not going to be.

MR DUIGNAN: Thank you.

MR BEST: I agree that the issue over determination of the range is an art more so than a science. I or the Trust have no particular objection to Dr Lally's method, it's certainly a lot more precise than the very naive kind of analysis that I once did which was largely to take the worst-case and the best case, or I should say the lowest and the highest numbers and combine them together. Because I mean unfortunately with that you just get a very large range and I don't think that would help the Commission at all in terms of trying to put its finger on any particular point in that range.

So I appreciate that the effort that Dr Lally has come to makes some more science and precision in terms of that analysis. Certainly I think some more analysis of the perhaps simulation Monte Carlo analysis would be useful in I guess corroborating the WACC range that Dr Lally has developed, and it might be a one-off exercise, it might throw up other interesting insights, but I think if nothing else it would be interesting to see the outcome.

And I suppose the final point I would make here in relation to this is that the industry, I think most in the industry actually see this as a WACC plus a margin. I certainly don't speak for everybody, but I would feel that just about all the industry players look to the final number, the 75th percentile or 80th percentile number rather than

what the point estimate is. And so in that sense I think it brings us back to a combination of this discussion and the discussion earlier yesterday where we looked at model error, diversifiable risks and so forth.

I think there are two elements that need to be separately considered. That is what is the number we use which takes into account the parameter errors, and so this is the WACC range that we're discussing now, and then separate to that is there a margin to be added on to that, and if we booked a date in 14 years time when we sit around this table again to relitigate this point, I'm sure we'll have better data, we'll be able to pat ourselves on the back and say we've now got this WACC range down to a very fine point because the parameter estimates are now a lot more accurate, and in fact maybe we can eliminate all errors.

But the industry will be growing because the number's getting smaller and that's what I mean, from an industry perspective industry is looking for a margin over whatever this WACC is, and I think by mistake they're seeing this as being the margin; and the more precise we are and the smaller this margin becomes is not actually helping the industry because the industry to have investment, to have the investment and innovation to carry on in these businesses are actually looking to have the WACC plus margin.

MR DUIGNAN: Thank you.

MR SHELLEY: Just to pick up on the last points there, I think that's right, whatever we pick as our best estimate of what we think the WACC probably is, if you're going to then allow firms to earn additional returns to provide incentives for all sorts of good behaviour, then that has to be a separate margin above wherever we pick.

Then to come back -

MR DUIGNAN: Could I just intervene there that under CPI-X regulation that was assumed to be provided by the overall structure rather than to be provided in WACC.

MR SHELLEY: Agreed. Also there's the issue of efficiency carry-over mechanisms which will be in other methodologies too, so agree there.

Now in terms of the narrow question of assuming that this is the right WACC model and looking at parameter estimates and what does that do to the WACC distribution itself, John Redmayne - no, sorry, it was Graeme mentioned that constructing a Monte Carlo model's not difficult. I can agree with that, I constructed one earlier this week in less than a day, looking at most of the parameters, and putting in plausible estimates for what the parameters would be, mainly from the straw man, a change to the

debt risk premium and using the sort of standard errors that Dr Lally has used in the past, assumed some different distributions, a beta distribution for leverage which bounds it between 0 and 1, log normal distributions for other parameters.

As long as there was zero correlations then the results were virtually identical to what comes out of Dr Lally's calculations. So it does turn on that issue of are there correlations, and I think some of the speakers have suggested that there are, I haven't specifically looked at that issue.

And yes, having done that if there are no correlations then Dr Lally's approach is fine. If there are some correlations then a Monte Carlo analysis can be quite quickly produced, and I did 10,000 calculations and it would take a spreadsheet on my laptop about 2 to 3 seconds to calculate it. So that again wasn't a difficult thing.

The remaining question is allowing for model error and I'd certainly defer to Tony van Zijl on the sort of range issues he was talking about for that.

MR DUIGNAN: Thank you. I should stress because of the time that as indicated I'm quite happy for people to cover both the issue of the procedure that we've been talking about and also actually whereabouts, namely that in a sense there is one precedent for 75% and that has been mentioned. So the rest of the comments are certainly happy to cover that and we could quickly hopefully if time permits get back to others.

PROF BOWMAN: I'll try just to deal with the couple of issues I think haven't been made clear. First, if you go back in time I think we all used to do ranges. That's kind of old hat but it was no big deal because it didn't end up mattering much. And then the Commission and Martin made the decision that, and quite the right one I believe, that there was this asymmetry between social cost and benefits.

Now all of a sudden somehow you have to deal with range, and that's when the ranges became important. The Commission made the choice of the 75 percentile within the range. A couple of years ago I suggested that we should get a little more structured on how we dealt with the range and so we've evolved into the one standard deviation idea. Whatever its flaws might be at least it does provide us some structure of what we're trying to accomplish. And then there's the issue of okay where do you choose on this range.

Now I think we need to avoid complicating or co-mingling some important issues. I think that procedurally what needs to be done is we need to have what we regard as our best estimate of WACC as a midpoint type of an estimate, a mean type of estimate, all things considered. And then we talk about a range or some mechanism, and I think a

range is an appropriate one, but some mechanism for deciding how we're going to add a margin where the purpose of that margin is to deal with this asymmetry of the social costs and benefits.

It's not some catch all, that's specifically what it's for. And the key point I'd make then is our starting point needs to be our best estimate of what we think the appropriate cost of capital is. So we make a bad mistake, I think, if we start talking about asymmetric risks and unsystematic risks and so forth with respect to this range idea. It's a totally different issue. The asymmetric risk, what we have and I think we all would agree, Capital Asset Pricing Model that we're using, whatever variant of it you use, is an under-specified model.

MR DUIGNAN: Could I just - I think we are meaning asymmetric social cost is the - and so let's, if we could, just assume that because we have talked about asymmetric risk and integration into the cashflow. So rather than re-go over that, let us assume for the sake of this discussion we are talking about asymmetric cost.

PROF BOWMAN: That's correct, but also that our start point is that we first arrive at an estimate of WACC which we believe is the appropriate best estimate. We start with an under-specified model. So to deal with asymmetric risks, not asymmetric social cost and benefit but asymmetric risk and any other of the - with the unspecified, the omitted variables problem, they need to be dealt with first. And I think what we have is we take a CAPM approach to the weighted average cost of capital, then we deal with what we regard as relevant omitted variables, we then arrive at an estimate of WACC we're comfortable with, then we face up to this issue of the asymmetry of social costs and benefits.

MR DUIGNAN: That's what we're trying to cover right now because we're running out of time.

PROF BOWMAN: Yes, but I think in the past the Commission and some people have sort of used this add on, the 75% as a bit of a carpet you could lift up and sweep stuff under and say that will be captured by the 75%. The purpose of the 75% or whatever it is should be very clear.

One other point and I'll stop, although I think I'd have more to say, is that the issue here in the way it's specified has to do primarily with shortcomings of investments, okay, it's an investment orientated issue. What is the social cost of not having investment? So if, for example, you're in an industry where nobody wants investment then this isn't relevant.

But if you're in another industry where investment is key and has got a high social cost to under-investment, then this percentile that you choose should be quite high. Tony expressed it as kind of a ratio, a loss function sort of a thing, and I sort of agree with Graeme this is not science, but you have to have some structure on how you're going about this, and it's not going to be the same for all industries.

MR DUIGNAN: Thank you. And I look forward to the submission therefore about how you would make a distinction. So if we could move on because we really do need to just focus upon this specific issue at this point given the time, thank you.

MR CARVELL: The one point I was going to make was on the question of what we actually do, and again in terms of our long-term planning for revenues for our regulated businesses, we assume consistent with the Commission's past practise that the 75th percentile would be used. That's not to say necessarily we think that's the right answer, but again it comes back to accepting the regulatory paradigm in which we think we live.

I think the corollary to that from my point of view is that I guess the challenge the Commission have is to provide a methodology or a framework which enables firms to estimate the impact of this parameter on their businesses.

MR DUIGNAN: Thank you.

MR SMALL: I'll try to make myself popular and be very quick. KPMG does use Monte Carlo analysis in place of that 0.3 on some occasions. We don't find it too expensive, although we can't always guarantee our client it's going to be useful when they're paying for it. I guess the point - we find it interesting and sometimes it helps but it's more important for us, I guess, as practitioners that our clients understand that there's a level of analysis in WACC that you can't go past before you're disguising the fact that there's an underlying range. It's more important that people understand that than we do some of this analysis.

On the other point I guess we'd say that we've talked over the last two days about some model errors that need to be adjusted for and the asymmetry of errors where they occur. I think this is Professor Bowman's point, they should be dealt with separately, they are separate points rather than sweeping up a range of things and putting them into an adjustment to the WACC range, we can say everything else I think in our submissions.

MR DUIGNAN: Thank you very much. So could I just ask whether Russell or Martin have a specific comment upon what we've been covering?

DR LALLY: Russell?

MR INGHAM: I'll be popular, even more popular. **[Laughter]** Take your time.

DR LALLY: I have listed ten things here that I would like to comment on but clearly that's not possible. **[Laughter]** So I'll limit myself to two of them. One of them is model error. I think that's important. It would push out the standard deviation in this kind of analysis, by how much I don't know, but I think it's desirable to consider that question.

The second question I'd like to comment on is the 75th percentile. Now would it be appropriate for me to comment?

MR DUIGNAN: Very briefly.

DR LALLY: I've never before expressed a view on this question to the Commission. Tony's analysis provides a framework, the loss function provides a framework for thinking about where you might choose in that distribution, and interestingly when I saw Tony's analysis I'd been thinking along similar lines myself. That kind of analysis, that loss function analysis, while it doesn't tell you what the answer is it does suggest to me that the 75th percentile is probably the lower bound on what you might choose. And you could easily choose something well above that.

MR DUIGNAN: Thank you very much. At this point I'll wrap up this session. There is a point that in your submissions - sorry, I'll give Paul a -

MR GOODEVE: I was going to make a quick comment which will probably make me incredibly unpopular, but I've sat through two pretty interesting days and what's become clearer and clearer to me over that time is actually how hard this is, and on another matter how little I know, but mainly how difficult this is.

What we have to be aware of, and I think the academics are a degree removed from it, is actually the impact of this. And if we get it wrong the likelihood is that there will be a break or a slowing or a constraining or a squeezing of capital expenditure; at a time when certainly in the electricity distribution business we've used up really what capacity existed in the system. We're having to replace the capacity that we built in the 60s and 70s and we're having to build the next lot of capacity for the growth that we hope to see over the next few years. So we're poised at an interesting time in terms of capital expenditure.

I think it's well accepted that probably parts of the system are already constrained and they need that capital expenditure sooner. It doesn't help you answer the question, but I think it does give everyone in here a warning about that we need to be careful, and if anything err on the side of caution.

Now the question that you'll say to me is how does that benefit the long-term

interests of consumers? I think it's very clear that the long-term interests of consumers are not benefited by short-term -

MR DUIGNAN: I think the comment, you know, your wrap up was fine, I fear that I'll find myself needing to see whether MEUG have a view. Could I perhaps avoid that - sorry.

DR LAYTON: Having stuck to the brief of dealing only with the first point, to find that almost everybody subsequently has taken up the time dealing with both I don't feel - I do have points to make about the point in the range and I will make them in the cross-submissions. But they are not exactly the same as the points made by those wanting consumers to pay higher and higher returns to investors.

MR DUIGNAN: Thanks, we've now had an opportunity to hear both aspects. Could I just make one last comment upon submissions, which is just as I heard this latest discussion it occurs to me that where advisors have practises that they're involved in, for example independent reports under the Takeovers Code, to the extent you're able to relate the description of how you arrive at WACC and how you arrive at advice for the Commission's work, if you are able to demonstrate just briefly that you are consistent with the way you do independent Takeovers Code reports. That for me, and I suspect for the other Commissioners, just does add credibility because those reports involve in the final analysis coming to a view on these very difficult issues and in, shall we say, under the fire where both types of errors have a real cost. So it gives one a bit of appropriately high powered incentives on advisors in those cases. Thank you, I'll hand back to the Chairman.

CHAIR: Thank you, I'll just go through a few minor points very briefly to conclude this workshop.

First of all during the workshop the Commission has posed a number of questions that participants have been invited to answer. The Commission expects to publish a list of those questions on its website together with the transcript by Wednesday the 18th of November.

Secondly, to aid the discussion around leverage the Commission circulated a graph yesterday morning to all attendees which illustrates the effects of leverage on firm's cost of capital under the Brennan-Lally and Classical CAPM. Parties requested additional information around this analysis. The Commission will release further details along with the transcript on its website, again on Wednesday the 18th of November, and that will we hope aid parties in making their post workshop submissions.

As I noted yesterday in my opening remarks this workshop provides the opportunity for interaction of views and it has been very helpful, but remember that written submissions do remain the principal vehicle, and I am mindful that particularly in the last session parties will want to elaborate further on their views and clearly the appropriate place is to develop those fully in written submissions.

We have decided to extend the time for cross-submissions in light of that. I indicated yesterday 27th of November is the date and the cross-submissions are now due on Wednesday the 2nd of December to give a bit more of a window of opportunity for everyone to make full submissions.

Given the Commission is working to finalise the cost of capital guidelines in parallel with this Capital Input Methodologies Conference under Part 4, all interested parties are also invited to submit on matters relevant to the guidelines as well.

I can bring this to an end now by thanking everybody for their participation in what has been a very informative exchange of views on what is a very complex matter. I'll thank our assistants there from Dr Lally and also from Mr Ingham for the submission staff; for the transcriber and sound recorder and all the other people who provide us administrative assistance. But lastly, many thanks to all of you for the time and effort and your commitment to this workshop, so many thanks. And unless there are further matters that immediately is pressing somebody that simply has to be raised I'll call this to a close, thank you.

Workshop concludes at 5.08 pm