

1 central issue that interests me or that I'll talk about is
2 this social cost-benefit trade-off, the asymmetry that
3 exists there, or to frame it in sort of a different way,
4 the impact of the Commission's decision on investment in
5 this industry.

6 I think it's fairly well-known and agreed that
7 New Zealand is coming into a position where there's a need
8 for a substantial investment in infrastructure, and
9 including in the gas industry. I understand that there is
10 only something like 10% or 15% penetration into
11 residencies in the provision of gas, so it would seem to
12 me that there is a potential for significant investment in
13 gas and for contribution socially to flow from that
14 investment. On the other side of it, that this is a case
15 where there's a significant potential social cost to
16 under-investment.

17 If investors feel that the return that they will be
18 able to earn on an investment is not sufficiently
19 attractive, then they'll choose not to make discretionary
20 investments, and that's sort of this edge that you operate
21 on in your decision in trying to achieve some optimal
22 sense of investment.

23 I think it is important to notice here that in the end
24 the decision on investment and whether investment is made
25 or not is made by the investors, it's not made by my view
26 of WACC or Professor Lally's view of WACC or any of the
27 experts, or even the Commission's view of WACC, but
28 ultimately whether investments are forthcoming or not is
29 determined by those investors and their perceptions, and
30 that's something that I'll come back to.

31 Geoff Horton emphasised that, in this whole exercise

1 of assessing excess returns, that there's substantial
2 uncertainty. His focus was more on the cost or asset
3 valuation side; mine's more with respect to WACC, but I
4 similarly in my submission stress that there's very
5 substantial uncertainty in the estimates that we make and
6 the estimation error in valuing parameters and some other
7 issues I'll comment on. Having read its submission, I
8 think in the next session with LECG you're going to hear
9 something quite similar, that these are areas where
10 there's substantial uncertainty, and these are three
11 independent assessments. In the whole process leading up
12 to today I never spoke to either of them. As far as I
13 know, none of us have conversed at all except through the
14 submissions that you see.

15 An obvious area of uncertainty with respect to the
16 weighted average cost of capital is in the estimation of
17 the parameters themselves; that is, the parameters in
18 particular in the capital asset pricing model more largely
19 and the weighted average cost of capital. It is that
20 estimation error that should be a factor in setting the
21 range that is given with respect to a parameter.

22 Over quite a few years I've done a lot of estimating
23 of cost of capital and I've read even more estimates of
24 other peoples' and cost of capital, and one thing that's
25 always struck me and bothered me somewhat is that there's
26 no particular structure to how you should go about doing
27 that. I mean, if I estimate something like, say, the
28 market risk premium and I know that there's quite a bit of
29 estimation error, then what guides me in deciding what the
30 range should be? It's quite a void; there really just
31 isn't any explicit guidance, and yet what is being done is

1 inherently a statistical process.

2 So that, if we say for example -- we set a range say
3 for a market risk premium from 6% to 8%, so we're saying
4 typically our best estimate is 7%, but it's somewhere in
5 the 6% to 8% range. Now, we would not be asserting,
6 certainly not in this case, that all possible outcomes
7 will fall within that range. So, there is some confidence
8 level that we have with respect to that range.

9 Now, it might be 50/50. We might say, well, I think
10 half of the time the true value or some outcome will fall
11 within this range; meaning half the time it will fall
12 outside of that range. Or alternatively, we could mean
13 that 90% of the time it will fall within the range. The
14 point I make is that, we don't have anything that tells us
15 how we should go about setting this range, and I think
16 that's a real shortcoming and something that I think in
17 this case is particularly important.

18 In many cases the range is really not very important;
19 what you're interested in is that best estimate, and the
20 ranges are in there for just some sort of idea that, well,
21 I should put a range in there, but at the end of the day
22 the range isn't the focus, the focus is all on the best
23 estimate.

24 In other cases the range can be quite important and
25 I'd suggest that this is a case where the range is quite
26 important. Going back to my starting point about the
27 implications for investment, I think that in this social
28 asymmetry that's already been discussed, that an important
29 issue and why this is important is because there is
30 investment, or there's some incentives for investment. If
31 we were in a context wherein development was not important

1 or we were indifferent about investment, then the social
2 asymmetry tends to certainly be mitigated if not go away.
3 The more important investment is socially, then the more
4 skewed the asymmetry is and hence more important is the
5 range that is set.

6 So, although the setting of ranges is inherently
7 statistical, it's surprising that there's been so little
8 regard to that process and so rare to see a developed
9 structure around this process, and that's one of the
10 things I want to address.

11 The issue that plays in with the setting of range is
12 this social cost-benefit idea, and I commend the
13 Commission for taking a position explicitly in saying that
14 you're going to choose a level at the 75th percentile and
15 that -- actually, I'll come back to that point -- but that
16 a primary point, reason for that choice is in recognition
17 of this asymmetry and the social issues that are involved,
18 and I think that's great. I think it provides a context
19 that has some transparency and is consistent with the idea
20 that, whether we address it or not, inherently this is a
21 statistical process.

22 If there wasn't any asymmetry for whatever reason,
23 that is, in the social cost benefits, then the range
24 really isn't very important. Because, if there's no
25 asymmetry, then our feeling about overestimating or
26 underestimating is balanced, and if it's balanced then the
27 point estimate is our best estimate because, as long as
28 the ranges are symmetrical, whatever that range might be,
29 whether it's very broad or relatively narrow, that is also
30 balanced. In those cases then the consequences of being
31 high or low are balanced and the range doesn't really

1 enter into it.

2 But in this case the consequences aren't balanced, and
3 when the consequences aren't balanced then the confidence
4 that I would think you would want would be skewed in
5 response to that imbalance. So, the more asymmetric, the
6 more imbalanced the costs and benefits are, being too high
7 or too low, the more you would want to move or tilt your
8 confidence in the direction of, in a sense,
9 counterbalancing that. Trying to balance out the social
10 issues where, if they're inherently asymmetric, then you
11 can balance it out by your choice of a confidence level,
12 and that's already been discussed; the way that you would
13 go in this case, you would go to a point above the
14 midpoint in ranges.

15 I don't know quite how the Commission went through its
16 process, but it would seem or an inference would be in
17 setting the 75th percentile in their choice, that the
18 Commission was saying something along the lines of, they
19 wanted that degree of confidence that the level that they
20 set was not too low. That admits to 25% confidence that
21 it might in fact be too low, but that's not going to go to
22 zero and some level of confidence on both sides is
23 appropriate depending upon this asymmetry.

24 The situation that the Commission is in is really a
25 decision-making process under uncertainty, and the
26 standard approach to that is dealing with it along the
27 lines that the Commission has addressed here. There's two
28 primary issues involved.

29 The first issue is -- not necessarily the first, but
30 an issue is the Commission deciding what it believes is an
31 appropriate level of confidence when it does set, in this

1 case its WACC or its asset values or whatever it might be,
2 and that that would be influenced primarily by this
3 asymmetry that we've talked about. So, that decision
4 needs to be made.

5 Now to then achieve, to go from a feeling that you
6 have to be 75% confident that you're not underestimating,
7 to going from there to a weighted average cost of capital
8 requires that there be some statistical characteristic to
9 the ranges. You need to go from the ranges themselves
10 having some statistical characteristics, or being
11 expressed that way, to allow you to then convert that into
12 some confidence level.

13 In my submission I suggested that ranges might be set
14 with the objective of achieving at plus or minus
15 1 standard deviation. There's nothing magical about that,
16 it could be plus or minus 2 or plus or minus 1 standard
17 deviation, but plus or minus 1 standard deviation is a
18 pretty appealing level to set it out.

19 Now, what that mean intuitively is that, if a range
20 was set at plus or minus 1 standard deviation, that you're
21 saying that there's two times out of three, about 67% of
22 the time the actual will lie within that range, but about
23 one-third of the time the actual will lie outside of that
24 range; about one-sixth of the time too high, one-sixth of
25 the time too low.

26 So, if you set the range at two-thirds and if your
27 range on WACC was set at 1 standard deviation above the
28 midpoint, you would be exposing yourselves, I could say,
29 or you would be 83% confident that the actual value was
30 not greater than that value that you set at 1 standard
31 deviation above. So, about five times out of six you're

1 going to be fine; one time out of six it will turn out
2 that you have underestimated.

3 There's quite a few issues that flow on from this. If
4 you move in this direction -- and I strongly encourage you
5 to continue on in what you've begun -- if you move in this
6 direction there are a whole series of problems and the
7 obvious problem is, well, how do you determine what's plus
8 or minus 1 standard deviation on a parameter? Another
9 problem is the inter-dependencies that would exist in the
10 various parameters of the WACC model. Another problem
11 would be what you will do when you don't think these
12 distributions are symmetrical.

13 So, there are still a number of problems, but the
14 first task to me is establishing a structure that allows
15 you to treat what is inherently statistical in a
16 statistical sense, rather than treating it completely in
17 an ad hoc sense, because it is inherently statistical.

18 So, to kind of summarise at this stage of what I'm
19 saying and of my suggestion is, that if the objective is
20 to set WACC at a level that will encourage an appropriate
21 amount of investment, and if underestimates of WACC are
22 more onerous in a social sense than overestimation, then
23 how the Commission sees this balance should guide its
24 decision on a confidence level. So, its perspective on
25 this asymmetry should guide its decision on a confidence
26 level, and then to allow that confidence level to be
27 applied it needs some statistical characteristics to
28 range, and I don't think -- I don't know that any of us
29 have actually attempted this; for example, Professor
30 Lally's estimations, I don't think that he has explicitly
31 said "well, these ranges are plus or minus 1 standard

1 deviation", and there's no reason why we should have
2 expected him to. In fact, in my earlier submission I
3 wouldn't have done that in a precise way myself. But yet,
4 if we want to actually acknowledge that what is going on
5 here is statistical, like it or not it is inherently
6 statistical, and we want to then address it in a way that
7 reflects that, then I think we need ranges to be developed
8 in a way that has some statistical content to it.

9 **CHAIR:** Can I just interrupt you for a minute.

10 If I understand you correctly, this is something
11 that's not been done; it's not been done by the academic
12 community, not been done by other regulators, yet this
13 issue's been around a long time and I think most
14 regulators acknowledge asymmetric risk, and I wonder why
15 it hasn't, why has this approach not been adopted. And,
16 not having your academic background in this area, the
17 thought of the Commission breaking new ground here is --
18 you know, seems challenging to me, given it seems
19 reasonable what you're suggesting to us, but I just
20 wonder, why have we not seen this approach?

21 **PROF BOWMAN:** Well, if this process and decision-making
22 process were thought of within the context of literature
23 on decision-making processes, then it would be dealt with
24 this way. So, I mean, there's a wealth of literature on
25 decision-making under uncertainty. But, in a regulatory
26 setting such as this -- and not just in regulatory
27 settings, even in just advising companies about their
28 WACC -- in my experience it's standard to talk about
29 ranges, yet it's not standard to have a structured
30 framework around where those ranges come from and what do
31 they mean.

1 Now, why is that true? I think -- I don't know if
2 this has been addressed explicitly but it hasn't in my
3 experience. I think most people have some sense that this
4 is a statistical process, that what you're doing here has
5 some statistical content to it, whether you're
6 statistician inclined or not, I think you'd still tend to
7 think of it that way.

8 Now, why hasn't it? I think one of the -- I'm
9 speculating, but I've thought of that more recently and
10 it's something that's always bothered me a little bit as
11 I've done this sort of thing, and in my mind I've often
12 but not always thought, well, I ought to be thinking about
13 plus or minus 1 standard deviation. In some cases there's
14 data that makes that not that difficult, like beta
15 estimations for example where we have statistical
16 representations of estimation error. In other cases it's
17 not so easy.

18 But, another reason I think is just that in many of
19 the cases that are addressed the asymmetry's not all that
20 sharp, it doesn't seem to me. It seems to me, where it's
21 the sharpest is where you really are concerned about
22 investment; investment -- the idea of discouraging
23 investment is quite onerous. In many cases that's not
24 that big an issue; in many regulatory cases it's not that
25 big an issue, and it would seem to me that when it's not
26 that big an issue, then the asymmetry's not so big, you're
27 fairly close to the midpoint being a balancing, and the
28 range is not important.

29 **CHAIR:** When I'm listening to what you're saying, it seems to
30 me the Commission did two things. I look, for instance,
31 at the information Mr Horton provided to us about the

1 recent OFGEM decision; the WACC range that they settled on
2 doesn't seem to be very wide to me at all. I mean, 5 to
3 5.9 is not exactly a wide range for something for which we
4 all accept there's great uncertainty about. The
5 Commission's range is much wider, so we have a much wider
6 range, we've allowed far more variation there, but in
7 addition to that we've taken the 75th percentile, which I
8 might add doesn't even fall within the range that they
9 had.

10 And, I know that a number of parties have suggested
11 the Commission provide more explanation for why it picked
12 75%. It's very difficult to come up with much science
13 around this. You can accept generally certain
14 propositions, like there's asymmetric risk, and at the end
15 of the day you fall back on judgment on where you might
16 go, but there doesn't seem to me to be a great deal of
17 guidance about, once you have accepted that there's an
18 asymmetric risk, where you go within a range or how you go
19 about setting the range.

20 **PROF BOWMAN:** Well, I'm going to come back to this with you,
21 but where I will get would be to say that I think that the
22 confidence limit that you say, say 75%, whatever that
23 confidence level might be, that that confidence level in
24 general can be confined to just to the issue of the
25 asymmetry and social costs. It need not be reflective of
26 asymmetric risks, stranded assets, things like that; it
27 need not be reflective of estimation error or anything
28 else, so it becomes quite focused.

29 If you have a structure on how you're going about this
30 process that's consistent with statistical decision-making
31 or decision-making under uncertainty, that I think it

1 actually focuses what you're trying to accomplish. At the
2 end of the day, for you to decide that 75% confidence is
3 your judgment on what's appropriate, that's your judgment,
4 and I don't know that there's something that is going to -
5 - a computer programme where you put in six inputs and it
6 spits out the answer, you're the ones that will have to
7 weigh up the asymmetry involved here and, given that
8 asymmetry, how confident you need to be that you don't
9 make a certain type of error, in this case underestimating
10 WACC. As I say, if the asymmetry is minor, then range
11 isn't really very important, because it's fairly
12 symmetrical, it's fairly balanced, so your choice is
13 pretty balanced and you take the midpoint.

14 But it seems to me that you're in a situation now, in
15 the Gas Inquiry, where the asymmetry's pretty strong and
16 so it really shines a light on this issue in perhaps a way
17 that -- well, I was involved in some with the Airfields; I
18 don't think it's near the magnitude there that it does
19 here.

20 **CHAIR:** But there again, I wouldn't expect this to be near the
21 magnitude that you might find in some of the telco areas
22 for instance. In this bit of industry that we're looking
23 at, which is not production, isn't hugely dynamic in the
24 sense of what you look at, say, in telecommunications.

25 Would you agree with that?

26 **PROF BOWMAN:** I would in a way, except -- I guess my quick
27 reaction is that the areas where that asymmetry, if you
28 will, is the strongest or not is the areas where you're
29 regulating. There are more areas which are just
30 developing rather than, say, lines, decisions on lines for
31 example; it doesn't have that characteristic. So, I mean,

1 you would know that better than I, but...

2 **CHAIR:** Yes, okay. I'm sorry for interrupting. Please
3 continue.

4 **PROF BOWMAN:** No, not at all.

5 I think at this point I've sort of said what I'm
6 suggesting, that this is kind of -- inherently it needs
7 structure and I think actually structure would simplify
8 your tasks, but it perhaps has the disadvantage of, it
9 puts you in the position that then your decisions and the
10 decisions that you make, like 75th percentile, are now
11 quite contextual and in a sense transparent on how you're
12 weighing up the balance and the asymmetries.

13 **CHAIR:** I think it's a really good point about being
14 transparent about what adjustments you make at which bit
15 of this assessment. When I read out the long list of
16 other items that I mentioned to Mr Horton, it's very clear
17 to me that we have to be very careful to know where we're
18 compensating for what uncertainty and which part of the
19 adjustment, and that comment has come through, and I think
20 it's very valid and useful.

21 **PROF BOWMAN:** And I have some comments on that too.

22 **CHAIR:** Okay. Can I just check with my colleagues if they
23 want to ask any questions before you continue. [**No**
24 **questions**]. Okay, please.

25 **PROF BOWMAN:** Geoff Horton talked about uncertainty, and I'm
26 talking about uncertainty, and LECG is going to talk about
27 uncertainty, and throughout this process virtually all the
28 parameters in the WACC model are measured with some error,
29 and the two that are measured in my view with the most
30 estimation error are the market risk premium and the asset
31 beta.

1 Now, Professor Lally, as far as I know, had no
2 direction on how he should set his ranges, nor no
3 precedent that would tell him how to set his ranges, and
4 so he went about doing it in a fairly conventional way
5 that probably any of our experts would have thought of,
6 although we might have come up with different ranges; I
7 don't believe that he was attempting to achieve a 1
8 standard deviation range or anything such as that. He
9 chose his ranges so that, in the two cases of ranges,
10 market risk premium and asset beta, the range that he
11 chose into both cases was the increment that he considered
12 to be the minimum increment that you could reasonably set.

13 So, for example, he says in his report that he doesn't
14 think you can estimate market risk premium at greater than
15 a percentile, and his range is plus or minus 1 percentile,
16 and in the asset beta his range similarly is plus or minus
17 0.1 on that estimate, which is what could be the minimum
18 increment that we might normally regard.

19 Now, in my view -- but now, in fairness to Professor
20 Lally, I'm kind of shifting the rules of the game and
21 thinking now in terms of, well, if what we're trying to
22 achieve is give this some statistical properties, and if
23 that statistical property that we're trying to estimate is
24 plus or minus 1 standard deviation, then how would I set
25 the ranges? I would set the ranges significantly larger
26 than he has set them. I'd set the range on the market on
27 the asset beta at plus or minus 0.3, and I'd set the range
28 on the market risk premium at plus or minus 2, and I would
29 probably be inclined to think even higher than that.

30 If I could actually digress shortly, because there's a
31 mistake I found in my report on page 18. Because this is

1 something that's not standard fare, I'd like to correct
2 the error, and it's towards the bottom of the page.
3 Actually there's the number "17%" at the far right towards
4 the bottom of the page, on page 18. What I've done there
5 is inverted it, and that should be "83%". I don't know
6 quite why I did that, but it would be 83% confident that
7 you're within or 17% that you're out, so that number
8 should be 83%.

9 So, my recommendation on ranges in my report are based
10 on now trying to introduce a statistical representation of
11 these ranges, and so, I think in that sense a direct
12 comparison of my ranges with Professor Lally's is probably
13 not quite fair.

14 Now, on confidence levels: I guess the key here to me
15 is this idea of balancing. If you've got an asymmetry in
16 the social costs, the more imbalanced they are, then the
17 more you want to tilt your confidence level. If they're
18 balanced, then right in the middle on your confidence is
19 fine. If there's a strong tilt, then you want to move up
20 in your confidence levels.

21 The Commission's chosen 75%. My rough guess would be
22 that that's too low and I would think something more like
23 90% would be appropriate. But, you know far more than I
24 do and I guess my main point here is just to encourage the
25 Commission to think about what it is doing in this sense
26 and to think about confidence levels as a way of balancing
27 out the asymmetry that it perceives in these social
28 issues.

29 There is one point I'd like to make and it goes back
30 to something you mentioned earlier in my response on the
31 setting of the confidence level. The Commission in its

1 paragraph 7.103, and Professor Lally on his page 43 of his
2 report, in choosing a WACC above the midpoint, in both
3 cases the same language was used, and it was said that,
4 well, we chose the 75 percentile because of the social
5 asymmetry and -- and I'm quoting -- "uncertainty as to the
6 correct parameter estimates".

7 Now, I guess my point here is, if you will provide
8 structure to this process, then the uncertainty on the
9 correct parameter estimates belongs in the ranges,
10 completely in the ranges, and it should have no bearing on
11 the confidence level. The confidence level then is
12 determined by your perception of the social imbalance.
13 So, it focuses that issue; you get, in that sense,
14 something clean. The parameter estimates, uncertainties
15 and all that belong in the ranges; the confidence level is
16 an attempt to balance out the asymmetries and the social
17 issues.

18 So far I've only discussed the errors and the
19 parameters estimates, but there's at least two other
20 sources of error that I mentioned in the report and I'd
21 like to mention here briefly.

22 The first is one as to, just the inherent
23 uncertainties in the capital asset pricing model and the
24 weighted average cost of capital, because both these
25 models have theoretical issues and application issues
26 involved around them, and I'm not going to mention them
27 any more, I just refer you to Professor Boyle's report
28 that I cite in my paper, I am quite in agreement with his
29 points there.

30 Now, if you felt that these were serious issues, how
31 then should you recognise them within this process if

1 we're going to have some structure? My suggestion would
2 be that, it should be dealt with in the WACC range after
3 all the parameter estimation is done, because this is not
4 a parameter-specific problem, this is a model problem, so
5 it operates really at the WACC level, and so you might --
6 what you might do -- and I'm not making a specific
7 suggestion -- but what you might do would be, arrive based
8 upon parameter estimates of a range and then say, well,
9 but we know we've got this whole other type of uncertainty
10 and so we're going to expand the ranges out, in addition
11 widen the range because of this problem that relates to
12 these theoretical or application problems.

13 The second issue relates to what's usually referred to
14 as "asymmetric risks" and these are things like stranded
15 asset risks and terrorism and natural disasters, things
16 like that. It's an issue that I think there have been
17 some quite compelling arguments put to the Commission and
18 the need to recognise these; the Commission's chosen not
19 to.

20 In its paragraph 7.14 the Commission said it:

21 "...believes that adjusting the capital asset pricing
22 model to compensate for unsystematic risk would be
23 arbitrary and ad hoc."

24 Now, I don't think I -- well, "I don't think"; I know
25 I don't agree with that. For one thing, there's no reason
26 whatsoever that an adjustment, were it to be undertaken,
27 need be arbitrary; it could be quite structured. For
28 example, the ACCC has provided in its decisions over the
29 last two years or so some quite explicit structure to what
30 is required to have these asymmetric issues recognised and
31 how you should go about measuring them. So, there's no

1 need at all for this to be arbitrary.

2 Now, ad hoc: I suppose in some senses it is ad hoc,
3 and perhaps with our current understandings of how markets
4 work that's unavoidable, but it's not completely ad hoc
5 because, as I say, the ACCC -- and I'm not saying that
6 that's the right solution, but it's clearly a solution --
7 is quite structured in the way in what it says, and it
8 says to the regulated companies, "If you want this
9 recognised, here's what you've got to do, here's where
10 you've got to convince us and here's where you've got to
11 develop the numbers". So, it can be quite structured.
12 It's still ad hoc, I suppose, to the sense that you're
13 adding it onto a CAPM view of estimating equities, the
14 cost of equity. But, in my view, to ignore them is just
15 simply wrong. There may be problems of estimating it, but
16 it does need to be estimated.

17 If you go back to my starting point, I said that the
18 Commission's decision is going to have some impact on
19 investments, and also, that investment decisions
20 ultimately are made by business people, not by the
21 experts, not by the Commission, but the Commission makes
22 some decisions, then the investment community decides
23 whether or not to invest, and in my view there's simply no
24 doubt whatsoever that in the "real world" that factors
25 such as this are imputed in making these sorts of
26 decisions, that they are recognised. That investment
27 community is just simply not that committed to the purity
28 of the CAPM, and so I think, given that ultimately that's
29 the focus of what the influence is going to be on
30 investments, that it's quite wrong to ignore those issues.

31 Now, if I can just direct your attention fairly

1 quickly to three other points in my report. Although I
2 wouldn't be in agreement with all of the various parameter
3 midpoint estimates that were made, the one that in
4 particular I would disagree with, and that I did in my
5 submission, is the estimate of the market risk premium or
6 the tax adjusted market risk premium. I just regard 7% as
7 simply too low, and I suggest using 8%, although in truth
8 I think that's probably too low.

9 In particular, you will have read my report, I would
10 just direct you to two particular points. One is that
11 Professor Lally has made an estimate in Australia and, if
12 you convert his estimate in Australia to the tax adjusted
13 context here, it converts to 8%. So, implicitly he is
14 saying that the market risk premium in New Zealand is 1%
15 lower than the market risk premium in Australia, and I
16 just don't regard that as a tenable position to take.

17 Also, implicit in the assumption from a market risk
18 premium data that he presents on the US, that the market
19 risk premium for New Zealand is equal to the market risk
20 premium in the United States, and again I discussed that
21 in my report, but I just simply don't believe that's a
22 tenable position to take.

23 The second issue is more complex, but I think it's
24 quite important in trying to get focus on the process.
25 Both the Commission and Professor Lally talk about the
26 nature of the market and how that relates to the models
27 that are used, and there's an assumption that is made,
28 that the New Zealand market is a domestic, fully segmented
29 market, and there is some discussion of international
30 markets and probably we're somewhere in between. But then
31 there's an assertion that is made repeatedly in Professor

1 Lally's report, and then by the Commission, that the
2 assumption of a domestic market provides some favour, some
3 benefit to the companies. In other words, that in some
4 sense that's overestimating and this is to the benefit of
5 the companies, and I disagree with that.

6 Now, my view on this fairly quickly is, number one,
7 the New Zealand market simply is an international market.
8 Now, on a complete spectrum perhaps we're a little short
9 of pegging ourselves up against fully integrated, but I
10 think we're far away from the midpoint in that spectrum.
11 We're in an open country market, free flow, we are an
12 international market.

13 As an international market I think it's quite
14 appropriate to say then, well, we should be using some
15 international form of the capital asset pricing model,
16 that the forms of the model that we use, whether it's the
17 tax adjusted model that's used here or the traditional
18 model that's used elsewhere, in either case those assume a
19 domestic market, a segmented market. The trouble is that
20 that model, an international capital asset pricing model,
21 we don't have one that is practical in application. So,
22 we have models conceptually, theoretically, but we don't
23 have them that are practical in broad application. But
24 yet, our objective should be to approximate the cost of
25 capital that would exist in the markets that do exist,
26 which is basically an international market.

27 So, rather than confront this situation by saying,
28 well, we're going to ignore what really is going on and
29 we're going to pretend that it's a domestic market, it
30 would be preferable to say, well, let's pretend it's what
31 we think it is, let's assume it's an international market.

1 Now, where do we go from here? The answer is, you go to
2 international -- the ICAPM. Yeah, but we can't apply
3 that, so what do we do? Well, there's a reasonable wealth
4 of evidence, empirical evidence that concludes that the
5 capital asset pricing model is a pretty good model for
6 approximating the result that you get with an
7 international capital asset pricing model of the type that
8 recognises exchange rate risks across the different
9 markets.

10 So my take on this; I'm happy enough with the market,
11 the idea with the models, but not because I want to
12 pretend that it's a domestic market, but rather, it is an
13 international market, so what's the best model available
14 to us, and it turns out that for all the evidence we have
15 now that the standard approach to CAPM is a pretty good
16 model; even within the context, a pretty good proxy for
17 the international capital asset pricing models.

18 So, on that basis I don't think it is correct, I
19 disagree with the assertion that doing our calculations
20 using the "domestic" markets and models provides some
21 benefits or some favour to the company, I don't believe
22 that's correct.

23 The thinking about that seems to drive from two
24 things, and it's mentioned I think by both the Commission
25 and Professor Lally, that this benefit will come because,
26 if an international model was used, you would have a lower
27 market risk premium and lower betas and, therefore, your
28 cost of capital would be lower. So that, the
29 international cost of capital would be lower than the cost
30 of capital that you were calculating. I don't believe
31 that you have a basis for making that assertion.

1 With respect to the market risk premium: I think it's
2 likely that the market risk premium in the international
3 market would be lower than the market risk premium for
4 New Zealand were it domestic. I agree with that. But,
5 that doesn't mean that the market risk premium that you
6 have chosen is less than the market risk premium
7 appropriate for an international market; that's a
8 different point to be maintained. So, I agree that in
9 some sense the true market risk premium in an
10 international market is lower than the true market risk
11 premium in a domestic market, but that doesn't necessarily
12 mean the market risk premium you have chosen is lower than
13 an appropriate market risk premium in an international
14 market.

15 With respect to beta, I see no reason whatsoever to
16 assume that beta would be lower. By the nature of those
17 models, on average beta has to be equal to zero -- would
18 be equal to 1, excuse me. So, in general across all
19 companies it can't be true, but with respect to
20 New Zealand I would think that, if anything, my
21 expectation would be that the betas would be larger. I
22 certainly don't see any reason to expect that they would
23 be lower. So, I think at this point the position that is
24 taken is an assertion and one with which I disagree.

25 Just one final point, and just very briefly on it. In
26 the early part of my submission I talk about how observing
27 what is excess returns in the structure that you are using
28 to define excess returns may not be what could be called
29 excessive returns or may not be attributable to the
30 exercise of monopoly profits, and I think that's just a
31 whole 'nother level on top of all the rest of this that

1 deserves consideration, but almost impossible to frame and
2 say "here's the number", but is something that I think the
3 Commission should bear in mind.

4 **CHAIR:** Okay, thank you for that presentation professor. I
5 just wanted to briefly follow up with you your experience
6 when you advised the National Competition Council in
7 Australia on the Northern Territories lines businesses;
8 I believe that was lines businesses.

9 I was just curious in that case -- I mean, you advised
10 on similar issues around WACC; what range was used in that
11 particular case?

12 **PROF BOWMAN:** I don't recall -- range on WACC itself?

13 **CHAIR:** Yes.

14 **PROF BOWMAN:** Gee, I'm sorry, but I don't recall. I'd be
15 reasonably confident that -- my work on WACC was a part of
16 larger work for them, but on WACC I believe that my
17 approach would have been pretty much as Professor Lally's
18 done in this case and I've done in other cases, and
19 without having it, from memory I would have thought that
20 maybe it had something like plus or minus 2% on WACC.

21 **CHAIR:** Okay, we might pursue that. I'd be interested to see
22 how you approached it when you were advising a regulator.
23 It's interesting to look at.

24 **PROF BOWMAN:** A comment on that though: I have thought, in
25 doing this in the past, although I'd say not consistently,
26 I have often thought I ought to be setting a range that is
27 sort of 1 standard deviation, but I can't recall ever
28 trying to aggregate that at the WACC level and then impose
29 that rigor there, and that's not a trivial exercise in all
30 honesty.

31 **CHAIR:** No, no.

1 **PROF BOWMAN:** So, I don't think I've done that.

2 **CHAIR:** Do you recall what point in the WACC range was taken?

3 **PROF BOWMAN:** No, I don't. I rarely actually look at these
4 after the fact.

5 **CHAIR:** I can understand that. Some of us don't have that
6 luxury though. Things have this tendency to come back
7 again and again.

8 Okay, thank you for that professor. I'll just ask
9 Commissioner Stevens if he has questions he wants to
10 pursue.

11 **MR STEVENS:** Most of the submissions that the Commission has
12 received favour the use of long-run historical data which
13 will produce, I guess, a much larger estimate of the MRP.
14 Then I guess, from that, then the costs of equity
15 resulting from the domestic CAPM will be much larger than
16 the international CAPM.

17 What's your view on that?

18 **PROF BOWMAN:** Well, I think that long-run historical returns
19 in New Zealand should be treated somewhere between, with
20 great caution and total disregard. We're simply a
21 different country, in terms of security markets today and
22 in the last 10-15 years than we were before. In any
23 economic sense we're a completely different country, and
24 wouldn't be much different than just taking a bit of
25 Australia and a bit of Hong Kong and rolling them all up
26 together, and frankly, I have no particular idea which way
27 the bias might be, but I just -- I'm very uncomfortable
28 with giving regard to that.

29 The trouble is that, to estimate market risk premium,
30 because of the cycles, you need a long dataset. Trying to
31 estimate it over 15 or 20 years is just simply -- it's not

1 reliable, and so, you're in a box. What do you do? My
2 primary suggestion is to benchmark yourself against
3 another country. So, you go to a country that doesn't
4 have these problems, and I go to the US partly because of
5 my accent and my upbringing, but partly because there's
6 vastly more data and research on market risk premium in
7 the United States than anywhere else. But, if you prefer,
8 go somewhere else, but go to a country where the data that
9 you're going to use is reasonably one country.

10 Now, it's not going to be literally because they
11 change -- regulation changes, tax rates change, but more
12 or less go to a country, and I suggest the US; estimate
13 what you believe the market risk premium is there and then
14 estimate what adjustments you might believe are
15 appropriate to move from the market risk premium in one
16 country to the market risk premium in another country, and
17 I go through that briefly in my report.

18 I think there are other ways, but that's the one that
19 I'm the most confident and feel the most confident about.

20 **MR STEVENS:** Just following up on that point: In your report
21 you mention that it was appropriate to consider all
22 approaches to estimating the market risk premiums and not
23 to give them equal weighting, I recall.

24 Have you any indication of what weights you would
25 apply?

26 **PROF BOWMAN:** Well, there is a vast number of approaches.
27 Professor Lally goes through a set of approaches in his,
28 and quite thoroughly. Other approaches were suggested to
29 them by another submission, he then responded to those,
30 and you could think of others. Surveys were mentioned,
31 but there's all kinds of surveys around. So, there's a

1 wide range of them.

2 Of the types that are considered, I tend to be
3 cautious about surveys and mainly what I want to know
4 about a survey is, who's being surveyed and what are the
5 incentives of those surveyors? So, for example, I would
6 pay virtually no attention to a survey of stockbrokers,
7 because they've clearly got biases in what they do. A
8 survey of academics, which is one that Martin -- Professor
9 Lally has cited -- I'm uncomfortable with calling him
10 "Professor Lally", but Professor Lally. He cited a survey
11 by Ivo Welch of academics. I'm more comfortable with that
12 in some senses. It's not obvious they'd have a particular
13 bias; they understand these particular models, but as a
14 group they're probably not as in touch with what's going
15 on in markets.

16 So, I'm cautious about surveys, I'm quite cautious
17 about the forward-looking estimates. I think that's an
18 area where there's a lot going on, and probably in 3 to 5
19 years we'll progress a lot, but at this stage I think
20 they're still pretty crude and they're dependent on
21 forecasts. So, I'm not too comfortable with them.
22 [Pause]. I don't know what else I can say. Primarily, I
23 just think the benchmarking would be my main approach.

24 Can I just add one other thing though? I do think
25 that the historical estimates, say in the US in
26 particular, are probably higher than what we would expect
27 going forward for a variety of reasons; liquidity's up,
28 transaction costs are down, diversification opportunities
29 have increased, governance has changed and so forth. So,
30 I think, even in the US those are higher than what we
31 would expect going forward.

1 **MR STEVENS:** I guess what you're saying though, if we're
2 going to apply lesser weight to survey evidence than
3 possibly even the Merton approach, the effect of doing
4 that would be to lower the MRP estimate.

5 So, would you agree that, by granting equal weight,
6 that would be more favourable to the gas businesses?

7 **PROF BOWMAN:** No, I don't know why you say that. And even
8 equal weights, Professor Lally makes the comment that he's
9 just given equal weights, but he's given equal weights to
10 the set of estimates that he's considered, but that's not
11 a complete set.

12 So, I mean, he's sort of given equal weights to one
13 group and then given zero weights to others, which is the
14 choice he's made, and that's fair enough. I don't see
15 though why -- I mean, I don't have in my mind this whole
16 table of them all and think, well, if I tipped it this way
17 what would it do. But, I mean, if you think that's what
18 would happen, then it's okay; I mean, that's my view on
19 surveys in particular and the forward-looking estimates.

20 **MR STEVENS:** Thank you.

21 **DR LALLY:** Well, Professor Bowman, some questions.

22 Let me start with your suggestion about 1 standard
23 deviation. I'm sympathetic to the suggestion but mindful
24 of the implementation difficulties.

25 You've already referred to one implementation
26 difficulty, which is, how do you convert some sense about
27 statistical error in the individual parameters, such as
28 the MRP and the asset beta, into a sense about the
29 statistical error on the WACC, which is generated from
30 them, and that's one implementation issue.

31 But, if one focuses on the MRP and just thinks about

1 the statistical imprecision that's involved there; if you
2 were to estimate the MRP just by looking at the long-run
3 historical data, and you come up with a point estimate,
4 the statistical process also throws out the standard
5 error. And, if you're looking at for example US data over
6 100 years, we know what the standard error is, it's about
7 2%. That coincides very nicely with your suggestion that
8 the standard error in that area would be about 2%; that's
9 fine.

10 But the moment you move away from relying entirely on
11 the historical data, and clearly even you are doing that,
12 you're putting some weight on other estimation techniques
13 which leads you to a lower estimate for the US MRP than
14 you would get from the long-run historical data, and
15 suppose some weight is being put on the forward-looking
16 approach that doesn't come with a standard error.
17 Clearly, there are a range of possible answers that you
18 can get depending upon what forecasts you make, but it
19 doesn't come with a standard error. And, even if it can
20 come with a standard error, in so far as you put some
21 weight on the forward-looking numbers and some weight on
22 the historical averaging numbers, how do you aggregate
23 that all into a standard deviation for the MRP?

24 So, if you've got some suggestions about dealing with
25 those difficulties, that would be of interest.

26 **PROF BOWMAN:** I mentioned it, I think -- I think I mentioned
27 three obvious problems with moving in this direction, and
28 one is coming up with this 1 standard deviation attempt
29 and inter-dependencies and whether they're symmetrically
30 involved. I think I mentioned two in there, that what
31 this would require if you really want to buy into it is,

1 in moving from the specific parameters to WACC is some
2 type of simulation.

3 I guess what I'm promoting here is, you know, bravo on
4 the 75%, but if you want 75% of something and it's going
5 to be a confidence interval, then you need something
6 underneath that, or else why bother with 75%, just pick a
7 number.

8 But now, back to your point about, well, where do we
9 do this: I'll tell you how I thought about it is, I
10 basically -- I mean, you and I both have had some non-
11 trivial education in statistics, and I know 1 standard
12 deviation is about two-thirds and that's exactly the way I
13 thought about it. I said, okay, with all of my knowledge
14 and experience with market risk premium, what sort of a
15 range do I think I need to set to where I feel that I'm
16 two-thirds inside that range, one-third outside that
17 range? I didn't rely upon the historical experience in
18 the US; that wasn't the reason I said 2%, and I feel it's
19 got to be at least 2%'s my view; it's probably more than
20 that. I mean, if I'm a betting man, which I'm not, and it
21 was going to be revealed, I'd probably want a wider range
22 even than 2%, but that's the way I'll go about it.

23 Now, that creates problems, because now you're stuck
24 with judgment, but jeez, you're not going to get judgment
25 out of this process. I mean, at least you're getting a
26 bit of structure onto this judgment. And now, if I was
27 asked to estimate something, I could even envision that I
28 would feel -- I would write something that was quite
29 cautious as to my ability to have expertise on the range.
30 I mean, if you told me, "I want your range to be 1
31 standard deviation", I could conceive that I might feel in

1 some case like, I wasn't comfortable with that, and I
2 might withhold my expertise with respect to such a thing.
3 But I think basically that's the way you're going to have
4 to live with it, you are going to be dependent upon
5 experts and their judgment, but at least then they have a
6 directive. So, if somebody comes up and says, like in
7 truth, I know why you have your asset beta range, because
8 you said that it was a function of how cost plus different
9 companies might be, so you've excluded estimation error in
10 setting that range. Now, with respect to the market risk
11 premium, clearly that's some reflection of estimation; I
12 have no idea why you came up with it. I might have done
13 exactly the same thing. I mean, I'm not in the least bit
14 critical of you in this respect, that's not the issue.
15 The issue is that none of us know why you happen to choose
16 that range and I happened to choose a different range from
17 somebody else, and I just think we need structure here.

18 **DR LALLY:** Okay, that's fine. Turning to the question of
19 whether the domestic CAPM is satisfactorily proxied by the
20 international CAPM or the other way round, you do cite a
21 paper by Koedijk and others and they show that there is in
22 fact very little difference. There's a similar paper by,
23 I think it's Mishra and O'Brien a couple of years ago in
24 Financial Review, and broadly you get the same result;
25 that comparing the domestic CAPM with the international
26 CAPM the numbers that come out are very very close.

27 But what's critical in both of those papers is two
28 assumptions. First of all, that the international CAPM is
29 true, and secondly, that the market risk premium that is
30 used in the domestic CAPM is the market risk premium that
31 would prevail if the international CAPM was valid, and

1 that would be equal to the world market risk premium times
2 the beta of that market against the world.

3 Now, that's implicit in the work of Koedijk and fellow
4 authors and also in the Mishra and the O'Brien paper, but
5 that assumption is not used by you or anybody else in
6 coming up with estimates of the MRP in your domestic CAPM.
7 So, if you're not using the same assumption that Koedijk
8 and others make, how can you rely on that paper for your
9 conclusion?

10 **PROF BOWMAN:** [Pause]. Well, my view on this is that we are
11 in an international market, and so what we should be using
12 is some international approach to estimating cost of
13 capital. Now, how do we do that? Well, the best that we
14 have is international CAPM, but it's not practical for
15 broad use and application.

16 So, what's our best proxy for it, and that's the
17 research that I've cited. Now, as far as whether that
18 then -- how that then means that we should go about
19 altering capital asset pricing model, or -- not altering
20 out the model or altering our estimate of MRP, it's not
21 clear to me how we should do it.

22 **DR LALLY:** Okay.

23 **PROF BOWMAN:** And, I don't know of some place to get guidance
24 from that on. I mean, I know it's discussed in the
25 literature, but nothing where I'd say, oh well, here's
26 this body of literature and it tells us this is what we
27 should be doing.

28 **DR LALLY:** Okay. If I can move on to your comment that I have
29 recommended 6% to the ACCC, and that would reflect some
30 advisory work I did for them in 2002.

31 You will be gratified to know that in the last few

1 months I've done some advisory work for the Queensland
2 Competition Authority and recommended precisely the same
3 number of 6%.

4 However, that number of 6%, Professor Bowman, is not a
5 number that goes into the standard version of the CAPM;
6 it's a number that goes into the officer version of the
7 CAPM, and the officer version of the CAPM is not the same
8 as the standard version; so you seem to be, if I can put
9 it in layman's language, comparing apples with oranges
10 here.

11 **PROF BOWMAN:** What would you regard as an appropriate
12 transformation?

13 **DR LALLY:** The appropriate transformation would be this: The
14 difference between the officer model and the standard CAPM
15 is the addition of the imputation credits; it's the
16 utilisation rate times the cash dividend yield, times the
17 ratio of imputation credits to dividends. If you take a
18 utilisation rate of 1, a cash dividend yield of 4% in
19 New Zealand and a ratio of imputation credits to cash
20 dividends in New Zealand of about 40%, you multiply it
21 through, it's 1.6%.

22 So, if you're talking 6% for the officer CAPM, you're
23 talking 4.4 for the standard version of the CAPM, and then
24 you slap on 2 percentage points to get to the tax adjusted
25 CAPM; you've got 6.4.

26 So, I'm talking 6.4 for the tax adjusted CAPM in
27 Australia and 7% in New Zealand, so I'm doing exactly what
28 you suggest; the number in New Zealand ought to be higher,
29 and I'm doing exactly that.

30 **PROF BOWMAN:** You make a key assumption there though that the
31 utilisation rate is 1. The assumption made with one minor

1 exception throughout Australia is that it's 0.5. That, in
2 a sense, is like saying you're going to flip a coin, it's
3 going to be heads or tails and you don't know which it's
4 going to be so you assume it's going to stand on its side.

5 But I think the pressure in Australia runs both ways,
6 but my guess would be that it's going to be down, not up.
7 When the ACCC actually makes a decision that it's going to
8 go down rather than up, and the critical factor there, to
9 kind of get beyond -- not let this get out of hand
10 technically -- what this has to do with primarily is, when
11 you pay dividend imputation credits, whether the people
12 that receive those credits -- no; whether the people that
13 determine prices, those investors in the market that are
14 the ones that actually determine security prices, whether
15 or not they can use those imputation credits, whether
16 they're a value to them. If they're of complete value to
17 them, they would be in a fully domestic market, then the
18 utilisation rate would be 1. If they are of no value to
19 them, as they can be in some situations with international
20 investors, then the value would be zero, so that's the
21 point of contention.

22 **DR LALLY:** Okay.

23 **PROF BOWMAN:** But we disagree on that, I'm sure.

24 **DR LALLY:** But in your submission you don't at any point note
25 these points.

26 **PROF BOWMAN:** Fair enough.

27 **DR LALLY:** Okay. In looking at what an appropriate market
28 risk premium might be for New Zealand, you take the US as
29 a benchmark, then you add on something, around about 3
30 percentage points, and you discuss that a fair bit.

31 One of the points you make is, you suggest that, if

1 one were to take the New Zealand market and think about it
2 as part of the US, the beta would be in the range 1.25 to
3 1.5.

4 Have you just pulled the data onto an Excel sheet and
5 run it?

6 **PROF BOWMAN:** No. Just used my judgment.

7 **DR LALLY:** I have, and the answer's 0.57 using data from 1980
8 to 2000. You regress the New Zealand market return on the
9 US, you get --

10 **PROF BOWMAN:** What's your R-squared?

11 **DR LALLY:** I haven't stored that.

12 **PROF BOWMAN:** Well, I think that's quite important.

13 **DR LALLY:** But you're asserting the result of that regression
14 would be 1.25 to 1.5; you're telling me about the point
15 estimate.

16 **PROF BOWMAN:** No, I'm not asserting what the result of that
17 regression would be. I'm saying I believe that, if it was
18 on that market, that's what you would get.

19 I find -- just as a matter of, from my expertise, I
20 would find it astounding if somebody revealed to me that
21 that truly was the beta that, relative to the US market
22 with -- and I think we have to put that in the context of
23 the SMP 500 because that's what's used in the index in
24 almost the majority of these studies.

25 **DR LALLY:** That's what I did.

26 **PROF BOWMAN:** I'm not disputing the results you got. I'm
27 saying two things: That, just in terms of my judgment, I
28 would find that astounding if that were really the "true"
29 beta of the market, because that would mean that the
30 investment in New Zealand was vastly safer than almost any
31 US investments; it would be in the order of US Utilities,

1 which are rate of return regulated.

2 But the other concern I would have, specifically
3 empirically, would be the R-squared in your regression.

4 **DR LALLY:** Okay.

5 **PROF BOWMAN:** Because, if your R-squared goes down, your beta
6 goes down.

7 **DR LALLY:** One last question. When it comes to asset beta you
8 site some recent work by Annema and Goodheart, and they
9 talk about beta values for electricity firms increasing
10 from 0.13 to 0.62.

11 These are equity betas, aren't they?

12 **PROF BOWMAN:** Yes.

13 **DR LALLY:** So, why have you cited them if we're interested in
14 asset betas in this section?

15 **PROF BOWMAN:** Because the relative difference between the two
16 is still relative. I'm not trying to take 0.29 and apply
17 it directly. I mean, the key point here is that, looking
18 at that period, there is quite a substantial
19 understatement that could be attributed to the -- what is
20 that, the "TMT" I think it's called.

21 **DR LALLY:** I don't know where these numbers come from, but
22 what I can tell you is that the data that I've presented
23 in my report, I've looked at betas that are estimated over
24 the last 5 years, the 5 years before that and the 5 years
25 before that, and the numbers that I'm presenting don't
26 look anything like these numbers here.

27 Do you have any explanation for that discrepancy?

28 **PROF BOWMAN:** No, I don't. Have you read their studies, those
29 two studies they cite?

30 **DR LALLY:** Yeah.

31 **PROF BOWMAN:** Do you have any explanation?

1 **DR LALLY:** They just present the numbers, but they don't tell
2 you how they're calculated, beyond the fact that they are
3 equity betas, they're not asset betas.

4 **PROF BOWMAN:** From my memory, the McKenzie study was fairly
5 transparent in what they did and how they went about it.
6 I don't recall specifically from the other one.

7 Could I ask you a question?

8 **DR LALLY:** Yeah.

9 **CHAIR:** I will allow it in this case, if it's in the same vein
10 as what we've had.

11 **PROF BOWMAN:** Yeah, and it's a brief one. But I don't
12 disagree with your empirical result of, what did you say,
13 0.56. But if you were a betting man, would you bet that
14 that's a reasonable estimate of the beta of New Zealand
15 versus the US?

16 **DR LALLY:** Yes. In fact, I published a paper some years ago
17 in which I gave some kind of intuitive explanation for why
18 you would get that kind of beta.

19 The New Zealand market is not perfectly correlated
20 with the US, and it's a small part of the world; you put
21 those two facts together and you would expect the small
22 markets to produce lower betas when beta's defined against
23 a world market index. That's precisely what you'd expect.
24 The empirical results that I get are just what I'd expect,
25 and I've seen the same in Australia. You run these betas
26 for the Australian market against the world index such as
27 the MSCI and you get beta numbers much less than 1.

28 **PROF BOWMAN:** That's not quite, though, the context in which I
29 made my statement. The context in which I made my
30 statement was what the beta might be of New Zealand were
31 it listed on the US exchanges, so it would be relative to

1 the US index, not a world index.

2 **DR LALLY:** It's the same whether you -- the same point comes
3 out; you get a number much less than 1.

4 **PROF BOWMAN:** Well, as I said, I find that astounding.

5 **DR LALLY:** Okay, I'll stop there. Thanks, Professor Bowman.

6 **CHAIR:** You will be interested to know, in the
7 Air New Zealand/Qantas proceedings on the appeal against
8 the Commission's decision, the High Court refers to the
9 dialogue between economic experts as "hot-tubbing". I
10 think I understand it now after watching an exchange like
11 this. I thought I might share that with you, we've been
12 amused by it but, you know, in watching people in the
13 audience today, I think that it's probably an apt term,
14 although I was surprised that the High Court used it.

15 I'll just see if we have any final questions, then
16 I'll take one more question, then I must break.

17 **MS BEGG:** In your presentation you suggested that the
18 Commission hadn't taken into account in its analysis
19 asymmetric risk such as natural disasters, optimisation
20 etc.

21 The Commission acknowledged in its report that, if the
22 companies treated these on an ex ante basis then it
23 probably would be appropriate to assess it on that basis,
24 but noted that we didn't have the information to do that.
25 Instead what the Commission has done, it has treated these
26 in the cashflows so that, if a company has been subject to
27 optimisation, that's treated as negative income. If it
28 has been exposed to a natural disaster that has increased
29 its costs, the Commission has assumed that will be
30 captured by its use of the cost that the company has given
31 to it.

1 I just wanted to check with you; obviously, if
2 expectations are not matched by events there will be a
3 discrepancy, but if the expectations are actually borne
4 out in practice the assumption we're making is that there
5 won't be a huge discrepancy.

6 So, I just wanted to check with you, bearing that in
7 mind, you still would say that we have not taken into
8 account these asymmetrical risks?

9 **PROF BOWMAN:** Well, if you've recognised some in the costs,
10 then I'd qualify it, I am not conversant with that. But,
11 I think -- I guess first, I think it's something that
12 needs to be dealt with ex ante; I completely agree with
13 Professor Lally in that respect, not ex-post.

14 I also agree with you, that it would be very difficult
15 to assess what this were on an ex ante basis, but that
16 doesn't change the fact that that's what needs to be
17 assessed.

18 I'd go further and say that, this is a cost in an
19 economic sense, this is a cost that the gas companies have
20 faced, even if they never thought about it; that from your
21 point of view of trying to determine what are excess
22 returns, whether they thought about it or not doesn't seem
23 to me to be economically relevant. No more so than any
24 other cost where they never thought about it and all of a
25 sudden it popped up; still, you know that they are
26 basically being forced into a position of self-insuring a
27 variety of things, of facing a whole bunch of risks, and
28 ex ante they are there and whether they thought about them
29 doesn't seem, to me, is the relevant point.

30 **MS BEGG:** The question for us is trying to get the least
31 imperfect way of catering for these costs, and it seems to

1 me that nobody in any submission has given us any
2 suggested way of estimating these costs ex ante, so
3 obviously if we were to do that, that would be done with
4 considerable error.

5 Also, it means that we would have to take the costs
6 that have actually been incurred out of their costs for
7 the analysis, and our experience with the data that's been
8 given to us would suggest the companies would have a great
9 deal of trouble when identifying actual events and taking
10 that data out.

11 So, from our point of view what we're left with is,
12 you know, in principle we can see that one methodology
13 might be better than another, but in practice it's not at
14 all clear that doing it -- trying to estimate the ex ante
15 adjustment and taking out the costs would give you a more
16 reliable number than the approach that we've done, which
17 is essentially an ex-post approach.

18 **PROF BOWMAN:** Well, I don't know what the costs look like, so
19 I couldn't address it in that sense, but I would think
20 that your approach would be an underestimate in that, if
21 there were no major events that occurred -- which my guess
22 would be there weren't -- then, to that extent, the extent
23 of actuarial -- I use the term actuarially fair and self-
24 insurance cost has been excluded.

25 **MS BEGG:** And likewise, the reverse could be true, of course,
26 if there's more events --

27 **PROF BOWMAN:** Sure, if an earthquake devastated Wellington and
28 you had all these huge costs, then it would spike up, and
29 appropriately; I mean, the whole process should be one
30 that looks a lot like insurance would look, but where
31 insurance is not available.

1 **CHAIR:** I'm going to have to close the session for now. I'll
2 just see if we need to reconvene with Professor Bowman
3 after the lunch break. [**Pause**]. I have to close it
4 because we've got a major decision to make and I've got 50
5 minutes to do it in. So, I'm sorry, we will have to close
6 up. I can reconvene the session, Michael, if we need to.

7 **MR WYDEVELD:** No.

8 **CHAIR:** No, okay.

9 I, again, would like to thank Powerco for making the
10 submission from Professor Bowman available to us, and
11 professor, I'd just like to thank you, you've done a rare
12 thing in these proceedings, as an expert spoken to us who
13 are not experts in this area in a language we could
14 readily follow and understand, and it's actually very
15 useful to us when that happens. You've graciously
16 responded to questions from Professor Lally, and again,
17 it's useful for us to be exposed to that dialogue, so
18 we're grateful to you for your submission and, of course,
19 we'll read with interest any cross-submissions that you
20 put in.

21 So, thank you very much. We will reconvene at
22 2 o'clock again with Powerco, and I believe it will be
23 LECG at that time.

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26 **Adjournment taken from 1.10 pm to 2.05 pm**

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