Mark Kennett

I should point out that squares are extremely inefficient as a design for a backbone and leg type network.

Robert Mercer, Hatfield Associates

I think the only thing I can add to that is I do think we've not done the specific study you said of changing the shape. The one thing that does help a little bit is that given that a wire center serves a large number of CBGs, the problem is a little bit self-correcting because you know where the actual centers of all the CBGs are, and therefore the CBGs at least — each CBG sort of recorrecting where it's located, no matter what you've assumed about other CBGs, so you're getting the variable distances from the wire center with a concentration in each one, and as I say, in some sense, you still obviously have a picture where these things are all nestled together. It is true they are nestled together as squares instead of some other shapes, but they are all sort of placing themselves out from the wire center. But that's only sort of a physicist's law of large numbers again. It's not any detailed analysis we've done to say what would really happen if you took all kinds of shapes, largely because that information is not available.

Jim Dunbar, Sprint

I think there are two points to make with it, and that is first of all, we have not done a specific analysis on it, but if you look at it, and you assume a square, no matter whether you compress the sides and stretch it or what shape you take it to, and of course all 226,000 block groups have 226,000 shapes. None of them match each other. They are all random shapes and all with it. The first point being as you compress one direction, as long as your facilities cover the entire area, all you're going to do is move it out of one piece of the facility into another piece of it. I think the second thing to recognize is that if you're sitting there trying to do a model, with all the random shapes of the CBGs, you're not going to get a proxy model that's going to recognize exactly what those shapes are. It's just not possible.

Robert Loube, FCC

You haven't tried the hot dog shape that was mentioned earlier? (Laughter)

Ben Johnson, Ben Johnson Associates

I would add that there's a danger in modeling if you try to improve shapes while staying with the Census Bureau's definitions of geographic areas, you aren't optimizing around anything. I don't know that you're actually improving the model, given that you're stuck with, understandably, the Census data to start with.

If we ever get down to the grid or get down to census blocks that are extremely small, then you can start reaggregating them and say "what's the optimal shape?" I have a feeling, though, this is one of those interesting modeling issues that somebody like the Joint Board or the FCC will ultimately look at it and much like they did with wire centers, say "even though we understand conceptually that reoptimizing the location of all the wire centers might improve efficiency a bit, it's just not worth it to us as regulators to change the world for modeling purposes. Let's stick with the existing wire centers. I suspect going to circles or ovals or other possible shapes wouldn't add enough refinement of the numbers to be worth the added modeling effort ultimately. But if someone wants to test it, it would be certainly interesting to find out what they find.

Robert Loube, FCC

Anyone else?

John Schrotenboer, Southwestern Bell Telephone Company

A comment. In several of our filings, we've had a map that's been produced which shows an overlay of the exchange boundary for one wire center in Texas, the CBG boundaries, and the equivalent square areas. And if you take a look at this map, you can see that there are in fact overlaps when you look at the equivalent square areas, and there are voids created and they don't match, in fact, the wire center boundaries. We haven't

done any analysis to determine the effects of all of this stuff, but in fact there are overlaps and voids when you look at the equivalent square areas being used with the same centroids for the CBGs.

Robert Mercer, Hatfield Associates

Yes, there will be. And there is another cause, too, of that, and that of course is that at the level of aggregation or disaggregation that models have reached today, which is the CBG level, of course, you know, you are assigning a whole CBG to a wire center so that also guarantees that, you know, the CBGs may not correspond exactly to the wire center boundaries. Now I was testifying at one point and somebody says, "well, doesn't that mean by definition that you've got a lower cost?" And I said, "no, not really at all, because at that point when the CBG was being assigned to the nearest wire center," I said, "all that says is that the centroid of the CBG is being assigned to the closest wire center, but at the extremities of that CBG, it may well be closer to another wire center, and in fact that may explain why the wire center boundary runs through that CBG." So, if anything, by still assigning those further out customers to that wire center, you may well be overestimating cost, not underestimating cost. And that, again, it would be nice to do better and month-by-month or at least half year-by-half year the usable geocoding, because you can see pictures. The question is always — you know, and I agree that pictures sometimes, you wish that you could say "is there a way to readily take those pictures

and map them into some kind of mathematical functions that would allow you to be more precise, but even that kind of thing is beginning to happen more and more. And I think it will be the goal of all models to sort of continue to say "are there refined ways to assign pieces of population."

Jim Dunbar, Sprint

I think as you look at the models, one of the things to recognize is that, yes, you may have some square and variance with the CBGs, but as you begin to run blocks or grids or any smaller resolution and reflect them only for those that are occupied, you have two effects: One, you more finitely draw the area that's covered by those customers, and you reshape it. The other effect of going to the smaller areas and eliminating those that are not populated is you in effect have redrawn or reshaped the area that you're serving the customers in. So you can do that reshaping to a large extent without ever changing anything but going to a finer resolution of census block or grid.

Robert Loube, FCC

Do we have another question? Well, I have one question of my own before we break here, and that is I would like to have the panelists talk a little bit more about sharing of structures. I know we all have our own small sample idea of how much sharing takes place. Each one of us looks that the poles that are down our streets, and say, "oh, yes, there it is, everybody is

sharing." Yet at the same time, as we walk down our streets in downtown, we see each competitive LEC digging another trench and thus there's no sharing whatsoever, and as we jump over the different potholes trying to get to work every morning. I was just curious, do you have any way of allowing us to verify the sharing proportions that are included in the models, or any way in which you would suggest we might go about doing this in the future?

Robert Mercer, Hatfield Associates

I guess as the model that assumes the most sharing, I think two things are important. One is that whatever has happened in the past, as near as we understand and again talking to our outside plant experts, there's a greater and greater incidence of this sharing to the point that in some municipalities it's now required because you can't trench after a certain period after somebody else has trenched, for instance. So I think you'll see more and more of it as time goes on. In addition, don't forget if this hoped-for competition materializes, it's not only that we have telephone, cable and electric, we may also have two or three providers of local exchange services. We already have caps today; we may have more than that. So the number of entities that could share would go up. How could you verify today? It's an interesting question. It's almost the best thing you could do, use the Joint Board with its various members, at least on a certain state or all state basis to survey what do the local regulations look like that either mandate that you do or mandate

that you don't, if there are such regulations that you don't have sharing, and form your own conclusions. But again, a forward-looking way, our conclusion was that you'll see far more of this kind of thing than you've seen in the past, and a survey of regulations may help you understand that.

Robert Loube, FCC

Anybody else?

Ben Johnson, Ben Johnson Associates

I guess the one point I would make, I think today we have a high level of sharing of poles because the electric companies and the phone companies do share on occasion. And you have cable TV. Now whether the sharing is fair, in other words, it may be whoever put the pole up first is paying the bulk of the cost and the next guy is paying less than pro rata share, and that could be a problem in modeling because you're going to have to decide, well, is this hypothetical new network going to be the guy that only pays the pole attachment fee, or is he the one who is putting up the pole and then hoping to get back some rent. But I think the concept of sharing is sound, and we're using a 50% factor as our default for the pole and we leave it at 100% for the other two. But I think certainly if you're modeling a small carrier that has a small share of the market, they can't afford to pay 100% of all of those structure costs and still be viable. So chances are, they won't enter the market unless through pole

attachment rentals or carefully planned timing of their installations. One way or another, they've got to find a way to get down some of the cost, for example, of conduit in a downtown area. The only way they could afford to enter is if they can be sharing or renting space for at least some of the runs. So you need a variable. As to your core question "where can we get good data on what the real percentages are?" I don't have an answer other than going out and surveying the companies that are in the field, both the new competitors and the incumbents.

Jim Dunbar, Sprint

I think that's very true in terms of the sharing. There's not much of a source except to go out and do the survey. I do think that one thing that you're going to have to recognize in developing any sharing assumption or any sharing answer that is going to in there, and that is as you look at the sharing that is done, it is done differently in the urban areas, in the suburban, in the rural areas. They do share differently. What you share and how much you share and what components are shared vary as you vary by your density or by your population concentrations. You are going to share differently when you are in downtown Washington, D.C. here certainly that if you go out 15 or 20 miles out into rural Virginia. What you share again and how you share it is going to be different. We tried to recognize that in putting the BCPM together so that you can share by element. The other thing, I think, that has to be recognized is you do not necessarily share all components of a type of structure equally.

For example, if you're going into an underground system, you may share — if you're building new facilities, you may share the trench, but you're not necessarily going to share the ducts or the manholes that are in there. Or you may share the manhole and not the ducts. You may share a pole on a poleline, but not the facilities that are on the pole. So I think it's important to recognize that there is a break in what gets shared and the costs that are associated with those units that get shared or not shared.

Robert Loube, FCC

Anyone else? Peter.

Peter Martin, BellSouth

I just think you need to be consistent in your assumption set. And, again, going back to some of the examples I gave earlier, if you're going to assume sharing on poles, and it certainly does take place and it probably should be reflected, then you need to reflect the proper size poles, poles that will accommodate the sharing. With regard to trenching, I don't think a lot of sharing takes place today, however again, you need to be consistent in your assumption set. If other telcos — if you're assuming they're going to share that structure with you, then you're not going to have 100% of the demand out there, and so you need to redo your model to reflect lower demand and different

economies of scale, smaller cables. And so, bottom line, you need to be consistent in how all this fits together.

Tom Wilson, Washington Utilities and Transportation Commission

I just wanted to share some information — no pun intended. In Washington, we did ask that the Hatfield Model be rerun in a GTR arbitration and for GTE. Again, the base case was an estimate of $13.92, using the Hatfield default assumption of 33% of the poles are the responsibility of the telco financially. We asked that the model be rerun assuming that — moved that zero sharing to 100% of the pole has to be paid for. And that took us from $13.92 up to $18.03. So it can have a substantial effect, especially with that much of a chance in assumption. Also, in running the models to test for sensitivity on that, I would simply note that when we did that, it was very interesting to see that the cost on concentrators changed when you did a change on the sharing assumption, and that was pretty counter-intuitive, I think. So all of the models when you're doing these sensitivity tests, watch what happens and see if it makes sense.

Robert Loube, FCC

Anyone else? Jim.

Jim Dunbar, Sprint

Just a comment and a caution on that very point you're making and that is from the standpoint that you can change the

sharing assumption all you want, but for example if you turn around and say "I'm going to share two-thirds of three ducts and I've got three ducts occupied and I'm going to share two-thirds of it," there better be six empty ducts to share. So the base cost ought to reflect nine ducts, not three. So if you turn around and have nine ducts priced and shared two-thirds, versus three ducts priced and not shared, now you're talking about apples and apples and not apples and oranges. So you've got to be careful when you do that analysis that you've got the right cost to match the sharing percentages that you're going to run, and not just take the same cost and vary the sharing percentage.

Robert Mercer, Hatfield Associates

I don't entirely agree with that. I would assume that in these sharing arrangements, you'll see each utility will install its own conduit. The trench will be there, the conduits will be put in place. There may be some slight increase in trenching cost because of the placement or stabilization of those conduits, but the Hatfield Model when run correctly doesn't share conduit itself and doesn't assume it's the utility that has to put in, although the model does put in extra conduit just for the telephone company for its own use. But in the same way that they're cooperating on trenching, I don't see why they wouldn't cooperate on placing the conduit that they need for their particular utility cable.

David Gabel, Queens College

As an alternative to coming up with a value of what percentage of the poles and conduits are shared, traditionally what has been in telephone company cost studies is a factor has been added in which shows the relationship between aerial cable and poles, or between underground cable and conduit. And that's a second course as opposed to going out and doing a survey and determining what is the extent of sharing is that you can work with some publicly-available data that shows what's the appropriate loading factors.

Ben Johnson, Ben Johnson Associates

Do we have time for one last comment? I just wanted to react to something that the fellow from BellSouth mentioned, because I think it's a very important point and one that's not been emphasized enough and we're at the end of the session. The costs on a per-loop or per-customer basis are sensitive to market share. And it's very important to understand that, that we're modeling the cost assuming 100% market share, and if people come in and say, "well, maybe wireless will be able to be cheaper," that's an interesting thought, but one of the things we need to know is what happened to that wireline company in that rural area if they do start losing market share to cellular or some other alternative? Their cost per line will go up. So unless we're willing to abandon that company and count on a cellular provider as our only means of communication to that area, the fact is the

problem may get worse of high-cost areas in some instances. Similarly, in terms of the dynamic here between the incumbent carriers and the competing carriers, it should be recognized that these estimates are in essence at the low point of the curve, assuming 100% market share.

Robert Loube, FCC

Thank you. I've just learned that I need to keep my ducks in a row. I wish to thank everyone on the panel. And we will now take a break. We will reconvene at 2:45 with our next panel which will be on expenses. Thank you very much.

(Break)

Panel 2: Modeling Operating and Support Expenses

William Sharkey, FCC

Hello. Could we take our seats please? Okay, let me just begin, this is the second of four panels for the Proxy Cost Workshops. The agenda for this panel is expenses, operating expenses. Let me just briefly repeat the ground rules that David enumerated this morning. There will be a set of four questions, which the panelists have all presumable seen in advance. I will read each question. I will offer the model sponsors the fist chance to respond. Each response will be two minutes in length. Then all the other panelists can respond for two minutes. Then

every panelist will have a chance to offer a rebuttal of one minute. And if there's time permitting, at my discretion, we can have additional rebuttal discussion. I guess after the four questions, we will open it up to questions from the audience. I'd like each panelist to introduce himself initially and then we can begin.

Self-Introductions

Roger White, GTE. Bob Schoonmaker from GVNW, a consulting company representing small telephone companies and also representing the Rural Coalition. Ben Johnson. I'm Mark Bryant with MCI Communications Corporation. Peter Copeland, U S West. Susan Baldwin, Economics and Technology, Inc. Dave Dowds, Florida PSC. Bill Taylor, National Economic Research Associates, Inc.

William Sharkey, FCC

Okay, thank you. All right, the first question: The difference in reported monthly cost using default input assumptions in previous versions of the models is significantly greater than the corresponding difference in investment levels in these models. The Hatfield Model uses values derived from the New England Telephone Incremental Cost Study to estimate forward-looking expense factors for digital switching and for central office transmission, and for other expenses deducts 30% from historical ARMIS date to estimate forward-looking total network

operations expenses. The BCPM computes expenses by taking a weighted average of LEC estimates of forward-looking expenses per line for each Class A expense account. The Telecom Economic Cost Model's expenses are a function of model investments. What is the basis for these, and other, assumptions being used to derive forward-looking estimates of operating expenses? What data or studies exist to support the algorithms used by model sponsors to support this treatment of expenses? I'll begin with Peter, I guess.

Peter Copeland, U S West, Inc.

Thank you. Well the BCPM uses forward-looking expense data that's on a per-line basis that covers maintenance accounts, your plant specific maintenance, your customer operations and marketing, and corporate operations. These are input by your Class B accounting level. Eight companies in the Bob group that provided advisory help to the BCPM provided forward-looking studies of basic local service to provide those expenses per line to be input into the model. Those expenses that were provided were examined. Outliers were removed on the high end so that the estimates would be conservative. And we also have checked that data against the historical amounts that have been recorded in the ARMIS accounts as a reasonability check. We look at those on a per-line basis, and to sort of allow these to be determined if you're really providing service for basic residential service you can look at the account specifically and see that plant-specific, which are direct expenses, are approximately 46% of the embedded

account. The customer operations and marketing are approximately 44% of the embedded account per-line. And the corporate operations are approximately 41%. This shows that we are looking at only the cost of the basic local service. We're not including vertical features or other features in assigning these customer costs. So we're trying to determine the direct costs of local service, and then applying the corporate overhead on a reasonable manner in which to recover that.

We found these to be reasonable numbers. They are all user adjustable and it's readily ascernible when you look at the numbers, the exact amounts by account. There's no combination accounts, so it's very directly determined how much will be flow-forward in the model unlike the Hatfield Model which does the overheads and includes some direct expenses in overheads on a percentage basis. Thank you.

William Sharkey, FCC

Thank you. Mark.

Mark Bryant, MCI

Well I guess first I would observe that the statement that — or differences in monthly cost in investments are at considerable variance, the variance between the expenses and the investment is a lot more. I think that really applies to the previous versions, and from what I've seen thus far, BCPM and with the new revisions to the Hatfield model, I think we may be

moving closer together on those. Then let me talk about the way that the Hatfield model does expenses. First, let me say that we would prefer not to use historical costs at all. But we have to do with the best information that's available. There's very little in the way of LEC estimates of their own forward-looking costs that's public available. What information there is is typically in proprietary incremental cost studies. We, as not being LECs right now, don't have the kind of information it would take to do a bottoms up analysis of what forward-looking costs would be, that is, estimates of time, labor rates and so forth. That being the case, we again use the best information that's available and it's a mixture of things. Where there is publicly available incremental cost information, we've used that information, and examples of that are the New England Telephone Incremental Cost Study figures for central office switching and transmission circuit equipment. Where there is a supportable basis for making an adjustment to historical embedded cost, we have done that. And we have seen testimony from several LECs that forward-looking network operations expense, which is — by the way, that's the only expense account to which we make this adjustment — includes engineering, provisioning, testing and network supervision. LECs have testified their forward-looking network operations expense will be but a fraction of what they have incurred historically.

We had testimony in California from a LEC witness there that said that it would be about 50%. We have settled on 70% as a conservative adjustment. And where we believe expenses to be

related to investment, we have used an expense-to-investment ratio based on the historical data. And to the extent that the model is predicting a more efficient, leaner network in terms of investment, it also will be predicting a leaner expense base for that network.

William Sharkey, FCC

Thank you. Ben?

Ben Johnson, Ben Johnson Associates

What we've done in our model is the classic approach that the — "classic" in the sense that the incumbent LECs have been doing it for many, many years before state regulators — which is to apply a percentage factor to the investment in order to estimate the expenses. There are weaknesses with that approach, I'll be the first to admit those. But it did give us one advantage, which is in arriving at these percentages we had our general knowledge of the kinds of percentage factors the LECs had been estimating historically, with many of these studies many of which were proprietary, but we were familiar with it. We used some judgment to try to keep them internally consistent and in a logical pattern. There's one strong advantage of this approach, which is as you switch back and forth between something like copper and fiber, it sort of automatically allows the expense to shift from cable maintenance to maintenance of electronics for example.

The BCPM folks in their latest version that's imminent, in which they've given us some preview documents, go to the other extreme. And I have some questions about that. Suggesting that the expenses are a uniform amount per line, per month or per year assumes away the problem of whether in fact there are high-cost areas. And yet we know there are areas with very low density and long loops, for example, that it just takes a long time to get out there in order to fix the problem. And it assumes it away completely by using a uniform amount per month. It is in general an area I think more work is needed. The truth probably lies in some combination of expense as a function of investment as well as expense as a uniform amount per month, and perhaps also expense as a function of other variables for which we might be able to gather data like climate.

William Sharkey, FCC

Thank you. Roger White.

Roger White, GTE Telephone Operations

When we looked at this question, we took a broader view of it. First, the concept as it's being presented now in terms of a forward-looking expense item we found to be fairly vague. It didn't specify a time period, and in the case of company expense data, these were all time series and pieces of information that we're looking at. And to not have some specification about what's the appropriate time period leads to erroneous forecasts.

You can't predict for exactly what you're going to do. Although the expenses, in terms of being the basic series that we're looking at for doing this projection for were company specific data. The reason being the actual expenses incurred by a company at any point in time represent the most information that you can have about what that expense is. It incorporates labor rates, it incorporate contract agreements, it incorporates all the complexities which you have currently that the company has to face on an individual basis. It's for this reason that on an expense basis, we like to have this done on an individual company basis. If you use some of the techniques that currently are being employed in the models, such as an expense-to-investment ratio or a per-line ratio, you introduce some distortions.

As an example, consider two companies, one consisting of a single switch with 80,000 lines, the other consisting of 40 switches with 2,000 lines. And it's very clear they're going to have the same number of lines that we're talking about. But the whole series of expenses from general support expenses to switch expenses to outside plant expenses are going to be higher for the company with the 40 switches than they are going to be for the company with the single switch. And for this reason, we believe that using strictly a per-line basis is going to lead to a distortion. Likewise the investments, although more accurate in some senses, are also going to suffer from the same problem. We can take that same 80,000 line switch and now decompose it into the same geographic area so that their 40 switches now occupy the same space where the 80,000 line switch was serving. The

expenses don't go up proportionally as they would with the other case, while the investment itself now goes up to reflect the different structure that we have in it. So for that reason, we have problems with both expressing numbers on a per-line basis, and a per unit of investment basis. If —

William Sharkey, FCC

Our of time. Thank you. Bob?

Robert C. Schoonmaker, GVNW Inc./Management

In working with the models and trying to find out where the expense levels come out, we've had a lot of concerns. We recognize as the question recognizes that a major portion of the total cost is in the expense side. I'd like to point out that in regards to the Hatfield Model, we have not been able to run that model and find out what the results are because they do not have data for other than the Tier 1 companies, and that's a serious deficiency. Comment was made earlier in the panel earlier that they would be fixing that at some point in time. I think it's important that the Joint Board recognize that although small companies have a three-year freeze period in which they do not have to use the models, that there will be a number of small companies that were not in existence in 1995, do not have any frozen numbers and will need to use the models immediately. And the model that's adopted in May needs to include the ability to analyze and to deal with small companies as well as large ones

because of that. In terms of the issue of looking at the data, it's important to recognize that small company expenses are different from the large company expenses, both in the plant-specific categories and in customer operations. If we compare nationally available data of large companies and small companies, in general the small company plant-specific costs, both on a per-line basis and in relation to telephone plant and service, are slightly less. Customer and corporate operation expenses are substantially greater than they are in the larger companies. And there should be at least some recognition in the models of those differences as company size varies. I believe the BCPM is going to incorporate that and we'll wait to see what they have in it. I do not believe that the other models incorporate that at this point in time.

William Sharkey, FCC

Thank you. Susan.

Susan Baldwin, Economics and Technology, Inc.

Operating expenses clearly should be forward looking, and we're told in fact in the BCPM sponsor's January 7 filing that operating expenses are now forward looking. Why? Because they've sent a data request to various ILECs, and asked them to look forward and to estimate expenses for various categories, plant related and non-plant related such as central office switching and plant maintenance and so on. If the FCC and the

Joint Board are planning to rely in any part on these estimates of expenses, I would urge that the data — the underlying raw data and the questionnaires —- be made generally and publicly available. The mere act of an interested party looking forward doesn't mean that those projected expenses, just because they're forward looking, are efficient. In addition to asking for the raw data and the questionnaires, I'd also recommend that the historical cross-check that Peter mentioned, that that table that appears — I believe it's in Attachment 10, to their January 7 filing — be annotated to include a column that shows where each of those individual line items, what actual historical expenses were made. And to the extent that the information is not readily available in the questionnaires, any assumptions that were made by the respondents about the planning horizon or any other critical factors that influence the projection of forward-looking expenses should be detailed in a follow-up submission to the Joint Board.

William Sharkey, FCC

Thank you. David.

David Dowds, Florida Public Service Commission

My experience to date is been that all of the data for the models on expenses are highly ill-supported. Unfortunately, I have not had a chance to thoroughly analyze the January 7, but there seems to be a pattern that the — over the last year or so,

that they keep bouncing around. Initially, the BCM filings had three factors of which the expense levels were too highly aggregated, and they didn't correspond to any normal breakdown of plant accounts that one would normally expect to see. Then the latest version of Hatfield — or the next to latest version — 2.2.2, based upon evidence they found around the country, decided to reduce network operations expense by 30%. Which in and of itself, at first blush, makes sense until you realize that one of the key components that Mr. Bryant didn't mention, that's in network operations expense, is power. So implicitly, the assumption would be that the LECs are essentially overnight able to reduce their power consumption by 30%, which is a little incredulous, at least in my mind. With respect to the BCPM, all I can say is, I have a lot of work to do when I get home, because they seem to be going to the opposite extreme where they're stating all of the expenses on a per-line basis which strikes me as counter-intuitive and I can't really say in greater depth without doing my homework.

William Sharkey, FCC

Thank you. Bill?

William E. Taylor, National Economic Research Associates, Inc.

Being last, I thought I'd step back and sort of look at the economic logic of proxy cost models, and sort of where they fit in as far as expenses are concerned. Remember, what we've done

in as far as expenses are concerned. Remember, what we've done by looking at proxy cost models is to throw out all of the cost modeling that has been done heretofore, and replace those cost models with engineering cost models that measure investment, that optimize investment, calculate investment for a hypothetical company in order that we are able to apply a standard of optimality. It's not what the ILEC happened to put in last year whose costs we're measuring, it's optimal. That's what we've gained on the investment side, assuming that we've done it right and we agree that we have, which nobody does. We have nothing like that on the expense side. That is, there is no engineering model, there is no economic model, econometric model, psychological model to tell us how to go from either the level of expenses that we've seen in the past for any of these companies, or the relationships between those companies' expenses and their investment, say account by account, or investment per line, or any other driver that you like. We don't have that model yet. That's the sort of piece that we're trying to add right here. And, frankly, that's probably the weakest part of the proxy cost philosophy, I guess, is trying to produce numbers which are fit for setting prices, for moving money from one company to another on the basis of not engineering knowledge or anything like that, but really flying by the seat of our pants.

The problem I have as an economist is, in this mapping for example between investment and expenses, I don't know whether expenses and investment are complements or substitutes in production. As we heard an example from Pete Martin today, where