TRANSCRIPT OF PROCEEDINGS

MARTIN MARIETTA CORPORATION

DOE/EPA WORKSHOP ON

USING CONTINGENT VALUATION TO

MEASURE NON-MARKET VALUES

Chantilly, Virginia

Friday, May 20, 1994

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MARTIN MARIETTA CORPORATION

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DOE/EPA WORKSHOP

ON

USING CONTINGENT VALUATION TO

MEASURE NON-MARKET VALUES

The Dulles Hyatt Hotel

2300 Dulles Corner Boulevard

Concorde Rooms A and B

Chantilly, Virginia

Friday, May 20, 1994

9:00 a.m.

PRESENTATIONS:

DR. WALLACE OATES
University of Maryland

DR. MAUREEN COOPER
University of Maryland

DR. PERRY SHAPIRO and DR. ROBERT DEACON
University of California, Santa Barbara

DR. PAUL PORTNEY, Presiding

DOE/EPA WORKSHOP ON USING CONTINGENT VALUATION

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Friday, May 20, 1994

(9:00 a.m.)

DR. PORTNEY: Could we take our seats, please? Good morning, and welcome to day two.

I'm delighted to see that both the people are still randomly distributed seating-wise in terms of their preferences for contingent valuation, and also that just about as many seats are filled this.morning as were filled yesterday morning.

I think that's a sign that something went well yesterday and that was certainly my impression.

If you will recall the discussion yesterday, a lot of it centered on whether or not the contingent valuation format or contingent valuation questions should be posed in a referendum format.

It's frequently the case that those questions are phrased that way, that people are voting on a hypothetical public policy program, and the notion is that their hypothetical votes in these kinds of referenda will shed light on their willingness to pay for environmental benefits.

Of course, people go to vote in real referenda and those real referenda often deal with at least quasi-public goods. So the first session this morning is going to focus on what we can learn about willingness to pay for voting in actual referenda.

This morning's key paper will be presented by Wallace Oates. I don't think anybody here can think of anybody better to write a paper that combines elements of environmental economics and local public finance than Wally Oates.

Wally is a professor of economics at the University of Maryland. Prior to that, he was, for many years, at Princeton University. Probably more than anybody else I know, he combines expertise in long and outstanding research records in both public finance and environmental economics.

It's my pleasure to turn the floor over to Wally Oates.

DR. OATES: Thank you, Paul, for the kind introduction.

The concern was raised yesterday about this conference, that it appeared, to some people at least, that there was a single-minded concern with the contingent valuation approach. And the concern was raised that we really shouldn't be sort of putting all our marbles in this one basket.

I think in a way that this concern was rather misplaced as regard to this particular conference. Because the organizers of the conference are certainly aware of this issue, and in fact designed the conference explicitly to explore alternative methodologies for valuing environmental amenities.

In fact, it was my charge, in the paper that I'm presenting to you this morning, to explore one such alternative, an alternative that has been used widely in the public finance literature to estimate demand functions for local public goods.

And my charge in this paper was to provide, first, a description of this approach, since I think many of the people in environmental economics have probably not been exposed to this. In fact, I think that is one of the concerns that some people have raised is that the contingent valuation literature has been somewhat insulated from some of the other work that has gone on in the valuation of public goods.

And one of the objectives of this conference is to try and open up this agenda to the consideration of some alternative techniques.

So what I'm going to talk about this morning is an alternative technique, and it's one that I am calling, for purposes of this paper, the collective choice approach to the estimation of demand functions for public goods.

What I'm going to do is spend some time describing the approach, and the findings and the interpretation and some of the difficulties that have arisen in this literature in local public finance.

And then to take the next step, and this is where I would invite and urge you to give some thought to the issue of how this particular methodology might be applied to the valuation of certain environmental amenities.

As I will indicate, and my discussion will elaborate, there are certain constraints on the use of this technique and it raises some hard questions about how we might use the collective choice approach for valuing environmental goods.

By way of introduction, I'd like to make two points about what I'm calling the collective choice approach here.

The first one is that it has some appeal, in fact, it has real appeal, I think, on two counts. First of all, it's based on observed behavior, so we spent a lot of time yesterday, and of course the literature has worried a lot about the problems of hypothetical responses of contingent valuation studies and their reliability in terms of relating to actual behavior.

I don't know. For a lot of us, certainly for me, and I think for many economists, the use of survey information, the use of hypothetical kinds of questions, raises red flags. I think it's deeply embedded in many of our bones that in some sense this isn't the kind of information that economists should be working with, or certainly are accustomed to working with.

And there's a real fundamental aversion that we have to get over to enter into the spirit of CV analysis.

This has a long history.

I was thinking just yesterday about this. At the time, back in the misty past when I was in graduate school and engaged in a first year micro-theory course at Stanford, I can still remember the instructor, Mel Rieder, who was the instructor in that course, sort of pounding away on the desk and saying, you know, economists don't ask people what they do; economists observe what people do.

I think that feeling is certainly deeply embedded in the bones of a lot of economists. So, at any rate, I would then stress about the collective choice approach that it does deal with observed outcomes.

Now when this problem comes up, the response that the contingent valuation people frequently offer is, sure, that's true enough, but the problem is that the revealed or RP approaches, as some people are calling them in this conference, the RP approaches simply don't encompass non-use values.

So if we're going to deal with non-use values, which lots of people think are important, then we're stuck we have to go beyond RP approaches in order to encompass this class of values.

While, interestingly enough, the collective choice approach, it seems to me, should in principle encompass non-use values, because the observed data that are the grist for the mill of this method are actual observed outcomes from collective choice community decisions.

And Peter Diamond and Jerry Houseman, for example, in their critiques of contingent valuation, have suggested, at any rate, that the usual sorts of legislative and collective choice processes should produce outcomes which, albeit imperfectly, should incorporate in some sense some of these non-use values.

So at least at a first cut, there's some real appeal here in the sense that the collective choice approach then a) deals with observed outcomes, and b) these outcomes should, or at least could in principle, encompass non-use values.

Okay. With that by way of introduction, what I'd like to do is run you quickly through the collective choice model. I'm going to walk through the basic model in order to familiarize you with the underlying analytical framework here, and summarize for you, briefly, the econometric findings that have emerged from this approach, and then take up with you, very briefly, a few issues in estimation and interpretation, to give you some feeling for the sorts of problems -- and there are real problems that this literature has encountered.

So let me turn quickly to the basic model.

(Slide.)

I have one overhead, which is a set of six equations which appear in the paper. For the non-economists, I hope you will sort of grit your teeth and I'll walk through this quickly. But I'd like people to have a sense of the framework for the analysis here.

The collective choice approach begins with a set of observed outcomes from various jurisdictions. These are typically outcomes involving the provision of some local public good.

So each jurisdiction then, in a sense, becomes an observation. And the trick, in terms of using the data to estimate demand curves, is to associate the outcome in a particular jurisdiction with a point on the demand function of some decisive voter.

Typically, what has been used in this literature is the median voter model so the idea, in some sense, is that what happens, the observed outcome then in some community represents a point on the demand curve of the median voter.

So the trick then becomes to identify this decisive or median voter and the socioeconomic characteristics associated with this individual, and to use these data then to estimate the demand functions.

The typical assumption is made in equation one of a multiplicative demand function which is used in most of these studies where G-star is understood to be the level of output of this local public good.

This could be some level of safety or level of schooling somehow measured, which I'll come to in a moment. And this is taken to be a function of a price variable which is in this model the tax price, that's capital T, to the individual voter with alpha being the price elasticity of demand and the decisive voter's level of income, Y, with beta then representing the income elasticity of demand.

Now one of the hard parts is defining T in an operational manner, that is, what is the tax price confronting the median voter, and what are the sort of other characteristics.

The way this literature has typically proceeded is to take, as the income of the median voter, median family income in the community which is a piece of data supplied in the regular censuses, and then to try and come up with some sensible definition of the tax price, T.

This is done typically by breaking the tax price T into its two components, little t, which is the median voter's tax share in the community, which is then multiplied times the unit price of the public good, to derive a price per unit to the decisive voter.

Tax share is frequently taken in these studies, since local governments rely heavily on the property tax, is frequently taken to be the share of the median voter in the local tax base. And this is approximated by taking the value, the median value of owner-occupied homes as a fraction of the total property tax base of the community.

So that's the tax share T, which has to be multiplied by some price for the local public good, which I'll come to in a minute.

In determining the unit price of output, one has problems here because it's hard, as we all know, to define units of output for local public goods.

In fact, it's typically more difficult than for a lot of environmental amenities. This is something I want to come to later. This problem is certainly easier in some ways for certain measures of environmental quality, but to define measures of output of local schools or levels of local safety is not an easy matter.

Moreover, the level of output depends not only on levels of directly provided budgetary input, such as police patrols or numbers of teachers, but it also depends on the size of the community and the number of users.

So that the actual amount of the final output consumed by a local resident G-star depends on inputs, but it also depends on the number of folks in the community.

Now this literature has developed a very clever way of addressing this issue.

I should note, incidentally, this whole literature goes back to two papers, both of which are excellent pieces in terms not only of initiating this literature, but providing, in a careful way, a systematic description and analysis of the underlying conceptual framework.

So this approach has, as I'm trying to suggest here, a fairly rigorous conceptual underpinning. These were the papers by Borcherding and Deacon in the early seventies, and by Bergstrom and Goodman. Those are the papers that launched this literature and pushed it a long way down the road. And most of the subsequent work draws very heavily both on the conceptual output and other associated methodology.

So, at any rate, what these two papers did is defined the relationship between final outputs and inputs as expressed in equation two.

So G-star is some function. Actually, that's the final output of a level of direct input, G, multiplied by the size of the population, N, where N is raised to the power minus gamma, where gamma is a parameter reflecting essentially the extent of the publicness of the goods.

And gamma presumably can range in value anywhere from zero to one. If it's value is one, why then this becomes essentially a sort of quasi-private good. If it's value is zero, then G-star equals G, so we've got pure public good.

But we have a spectrum then over which this value can range suggesting difference in the publicness properties of the good.

Okay, so this is the way that problem is dealt with. The difficulty again is we don't really have measures of output. What we have, we've got loads of budgetary data on local government, measures of expenditure on various kinds of functions, so the trick then becomes, in equation three, to multiply through by the price of these final outputs P-star, okay.

And that's going to give us then, in equation four, if we take logs, we now have expenditure, which we have got ready measures available of on the left hand side, so we can estimate a demand function using data on expenditures as the dependent variable, and these variables on the right hand side reflecting population size, tax share, and so forth.

So this gets us down into equation four, and if we go through suitable sort of algebraic gymnastics, and make the right substitutions, we get to five, which is an equation in a form in which we can estimate, involving the tax shares, income, population, and so forth.

The typical step then is to append to this a vector of so-called Taize variables, one of which is a measure of the fraction of renters who reside in the communities.

As you can see, once you've estimated equation five, you can recover, interestingly, an estimate of this congestion parameter gamma, from equation six.

So the exercise then has essentially evolved, pulling together a large number of data, cross section data on different communities, which are then used, each community serves as an observation for purposes of estimating equation five.

I might add here that one of the sort of nice things about this is that given the variation across communities, there's a lot of variation in the price term to work with, and this often times is a problem in other sorts of studies where differences in price are restricted to a fairly narrow range.

Okay, that's the basic framework for these, so what we're doing essentially then is taking an observed outcome in a community and associating it with the point on the demand curve of a decisive voter, and each jurisdiction serves as a unit of observation.

We have a cross section of many jurisdictions and then we proceed to estimate a demand curve, much as one might for a private good.

Let me tell you briefly something about the findings in this literature. The results on the whole, I think it's fair to characterize as being pretty sensible results.

This method, this approach has yielded reasonable looking demand functions, certainly quite plausible sorts of equations. For most of local public goods, the estimated price elasticities are on the low side, typical results on the order of say 0.2 to 0.4.

So the literature suggests that the demand for most local public goods in relatively price inelastic. Likewise, estimates of the income elasticity, although showing a wider range among studies probably than the price elasticity, still I think on the whole suggest relatively income-elastic demands, typical values on the order of say 0.6, but certainly some studies with values over one.

One of the sort of intriguing findings has been the implied value of this congestion parameter, gamma. And this has been a fairly consistent finding over these studies.

The estimated values of gamma seem to cluster around 1) suggesting that local public goods are much more like private goods than like public goods in terms of this parameter. In fact, it has led some people in the literature to characterize local public goods as quasi-private goods.

A fourth finding of note in this literature is, I mentioned this vector of taste variables that gets tacked on to these equations. One of the things that comes out consistently through all of these studies is that this variable I mentioned earlier about the fraction of renters in the communities turns out, almost without exception, to be highly significant, positive and large, suggesting that communities with large fractions of renters, other things equal, spend more on local public goods than do communities with a lower proportion of renters.

This is an intriguing finding, a troubling finding in certain ways and one that has been the source of a good deal of speculation. But the suggestion has been made that the issue here is that as far as property taxation is concerned, renters don't think that they pay property taxes, and that there's a case of fiscal illusion here. Renters think they get this stuff free.

So when local referenda come around, renters are very anxious to vote for high levels of local spending in order to get these goods at a relatively low or perhaps a zero price, and this has been, as I say, a subject of some interest in the literature.

Some people have argued, well, in fact, this may not even be a misperception. It may well be the case that property taxes are only partially passed on to renters and passed on with a substantial lag, if at all, so that in fact this isn't an illusion at all. Renters really do have a lower price, pay a local price for local public services.

So that's one of the issues that has come up.

Let me very briefly mention a couple of others.

I spend considerable time in the paper talking about some of these issues in specification and interpretation, and I don't really have time this morning to spend as much time as I do in the paper.

I'm just going to mention briefly a couple of them. Then I want to get on to what I think is of central interest to us here, but I think we need a little bit of this to get some feeling for what people are worrying about in this literature.

I mentioned the result on the congestion parameters, suggesting that local public goods are like private goods. This has been subject to some discussion in the literature. There's some possibility that this result is sensitive to the specification that has been used for the congestion function, that is, equation two.

Although, in later work, this specification actually has stood up pretty well. But there are other ways that one can interpret this effect.

The value from gamma, as you can see in equation six, is being recovered from the estimation of some other parameters, one of which is an estimated coefficient on the size of population terms in the expenditure equation.

So in a way, what's driving this is the fact that as population size goes up, expenditures go up.

There are other possible explanations for that.

Tom Borcherding has suggested that this really may just be reflecting some bureaucratic-type influences. As jurisdictions grow, bureaucratic influences are stronger and the budget gets bigger.

There's also the possibility that this may reflect the fact that in bigger jurisdictions, there's a wider range of services produced, and that that's not been accounted for.

So, at any rate, there are some issues of interpretation concerning this congestion relationship.

One that's in some ways perhaps more to the point and is, I think, interesting in the connection of this conference, has to do with a point that was raised by Jerry Goldstein and Mark Pauley reasonably early on. That is that this literature makes use of, as we've seen here, the median voter model.

The assumption is that there's a decisive voter here that's determining the outcome and we're positing in this whole procedure that the outcome is a point on this decisive voter's demand curve.

Well, there's a very large literature in local public finance that takes a very different tack to all of this, and stems from a very famous paper by Charles Tibo back in 1956.

This literature thinks of local finance as involving a system of local communities among which people choose, much as they choose in the marketplace. So individual households are mobile, they select, as a community of residents, a community that provides a vector of outputs of local public goods, and taxes that essentially suits their fiscal preferences.

So instead of having a sort of immobile population that's determining outputs according to some local decision rule, the Tibo model sees people as moving around more, and people with similar tastes or similar demands for local public goods as clustering together in localities that provide the public goods that suits their particular preferences.

What's interesting about this is that if the world is Tibo-like, this procedure is not legitimate, and as Goldstein and Pauley showed, the estimates of demand of price and income elasticities are systematically biased if the world is Tibo.

So a substantial part of this literature has tried to look at Tibo sorting and ways in which one might accommodate that in terms of the estimation procedure.

The implication, in one sense, is rather straightforward. People are locating in communities which provide outputs of public goods that they demand. That, in some sense everybody's outcomes on are every household's demand curve, subject to some random disturbance terms.

So presumably, what you need then is simply a random sample of individual households and you can associate the outcomes in the jurisdictions in which they live with points on the individual demand curves.

So a very different kind of estimation process is suggested here, and Perry Shapiro, among others, along with Ted Bergstrom and Dan Rubenfeld, have done a lot of work to deal with these approaches of people sorting.

In particular, they've developed an approach which is of interest, I think, here because it deals with what I've called in this literature "micro-estimates." That is, using households as units of observation instead of communities.

This has involved some actual sort of survey, moving into the hypothetical realm, and a number of databases have been constructed involving telephone surveys in which households have been asked questions, such as would you like to see your state and local government spending more, the same, or less on local public schools.

And if people answer yes to that, there often times is some kind of a follow-up question. Would you be willing to pay more in taxes in order to fund this additional spending on schools?

And with that kind of information, some rich databases have been put together and demand functions estimated using the so-called micro approach to estimating demands for local public goods.

Okay, that's a sort of brief rundown on this general approach. Some of the kinds of problems that have surfaced and, as I say, you can see the paper for a more extended treatment of some of these issues in specification and interpretation.

What I'd like to do now, with this as background, is move to the issue which I think is of central interest here, and that's the question of the potential of the collective choice approach to serve as an alternative or perhaps some kind of a supplement or complement to the contingent valuation approach for estimating the value of environmental amenities.

There are some tough problems that come up in this. I would hope, and in fact sort of urge you, as we think through this together, to have a mind towards thinking about the kinds of environmental amenities where this kind of an approach might work, where it might be applicable.

And for the reasons I'm about to suggest, I think the approach is of limited value. There's certain kinds of characteristics that a good must possess in order to be amenable to this approach.

Now, in fact, there's one class of goods that one might call environmental goods, which fits rather neatly into this category, and for which the collective choice model and approach has been used.

This is municipal parks and recreation. In fact, the original Bergstrom Goodman paper estimated a demand for municipal parks and recreation using this framework I used with local expenditures as the dependent variable and the sorts of right hand side variables that we've talked about.

More recently in fact, Dallas Bertrand and Winston Harrington of Resources For the Future, have followed up on this further and have estimated some demand functions, again for municipal parks and recreation, looking at the interesting hypothesis that local jurisdictions might try in fact to free ride off one another in the provision of this particular service.

So that's one class of goods for which the application of this technique is fairly straightforward and follows the lines originally laid out by Bergstrom, Goodman, Borcherding and Deacon.

What I've tried to do in this paper is to think about other possibilities a bit, that is, other cases of environmental goods for which the collective choice approach might work.

There's one sense in which the environmental amenities might be in fact easier to handle. In some ways, it's easier to get a handle on a measure of physical output. In many cases, air quality is typically defined in terms of the concentrations of certain key pollutants; likewise, water quality, and so forth.

So in fact, one might not have to go through these gyrations to derive a model in which expenditures is the dependent variable. One might simply be able to take observed values of the cleanliness of air and the cleanliness of water, stick them in there as left hand side variables, treat them as outcomes of a collective choice process, and proceed to implement the procedure much as I have described it earlier.

Now, as I say, this sounds sort of potentially exciting and promising particularly again because, as I say, we are dealing with observed outcomes on the one hand and presumably outcomes which might well encompass non-use values.

But there are some real problems here, and let me raise what I see as the three major problems.

The first one is, what's the relevant jurisdiction here. Now, for most of the literature on local public goods, we have well-defined fiscal jurisdictions in which schools are provided or police services, or whatever, and these are nicely linked into the budgetary choice process.

This is not so clear for a lot of environmental amenities. Air quality typically is a joint product of what's going on over a larger area. We may even want to be thinking about EPA air quality control regions as the relevant jurisdictions and so forth. So we may need to enlarge our sense of jurisdictions here for a lot of environmental goods.

This, incidentally, is not an insurmountable problem. In fact, there's been some work using the collective choice model. Mack Zewicki, in particular, did a recent dissertation at Maryland in which he used this to look at goods provided at the state level and estimated demand functions for public services provided by states, and got quite plausible and sensible kinds of results using the collective choice model.

So simply enlarging the jurisdiction may not, in some instances, be an insurmountable problem.

A tougher problem I think has to do with the determination of tax price. And I think in my paper I don't give this problem sufficient attention.

Both Maureen Cropper and Perry, in their comments, quite rightly take up this' issue and take me to task a bit for really not treating this as thoroughly as I should have.

But the issue here, let's think about air quality for a minute. What in some sense is the tax price of improved air quality and in particular what is the tax price as it would be perceived by the decisive voter in the community.

That's tough because a lot of these things involve regulations which are placed on firms, and so the manifestation of costs takes the form of increased costs of production, some of which may well be exported outside the jurisdiction and so forth.

So for certain goods of this kind, it's not so clear that we can link the price or the cost of improved environmental quality in a very direct and meaningful way through this tax price argument to the decisive voter.

Somehow this process or this method that has been used to estimate demand curves sort of depends on things being tied in through the local public budget. So it may be that in thinking about environmental goods that would be amenable to this approach, we may need to think in terms of things that enter in more direct ways to the public budget.

Al McGarten was actually suggesting some other sorts of things for which the median voter may well be aware of costs as they manifest themselves, say, through changes in property values and things. These are various restrictions on individual kinds of activities, such as use of lawnmowers, and various kinds of marginal decisions that may be made in communities.

So I may be being overly restrictive in suggesting a constraint that things have to go through the local budget.

At any rate, there's a real problem here about tax price, and I think we need to think hard about that.

The third problem has to do with the nature of the regulatory setting and the determination of the outcome in the local community setting. The issue here is that for most local public goods, the things that we've estimated demand functions for in the public finance literature, the outcome is locally determined.

It may be through a referendum, it may be through elected representatives or whatever, but presumably the outcome is some manifestation of the preferences of the residents of the jurisdiction.

Well, as we all know, for a lot of environmental goods, regulations concerning standards for environmental quality are imposed externally. We have national ambient air quality standards and so forth.

To the extent that we can't regard the outcome on the left hand side of the equation here as being chosen in some sense truly by the community, obviously we've got problems here.

Now again, this is something that I think one needs to think about in terms of applying the research. Now things may not be quite that bad. A lot of areas, for example, are attainment areas for air quality and for other sorts of dimensions of environmental quality.

Once they're attainment areas so that this constraint is not binding, it may be the case that there's some range for choice here that the community may exploit and that we might exploit as researchers in estimating demand functions.

But, at any rate, the regulatory setting for all this is clearly something that we need to worry about.

But, at any rate, I would like to sort of challenge you to think hard, if you would, about some kinds of environmental amenities for which, at least in principle, we might be able to use the collective choice framework as a mechanism, as a method for evaluation.

Finally, what I do in the last part of the paper, and I'm going to be a little more brief here because I think this is of less interest, but still of some, I flip the question on its head. We looked at the issue of using the collective choice approach to value environmental amenities.

How about using the CV approach to value local public goods?

What choice possibilities are there here?

Well, as I mentioned, there actually, in a way, has been something akin to that already in the work of Perry Shapiro and some of the others, where some survey kinds of techniques have been used in the micro-based approach to estimate demand for local public goods where they've asked households, do you want to spend more on the schools, the same, or less.

These data have been exploited to estimate demand functions. But there is typically a difference. Most contingent valuation studies, at least the way they've been framed, sort of don't ask, do you want to spend more. They've typically been framed in terms of some stated physical improvement for which, or disamenity for which, the respondent is then asked to express some willingness to pay.

I see no reason in principle why we couldn't do this with local public goods. In fact, this might be interesting in the sense of getting some results from a contingent valuation approach that one could try to compare with the estimates coming out of the local public goods literature.

One problem here is that the local public goods collective choice stuff, as I mentioned, does relate to expenditures, and so direct comparisons here, it's not quite clear to me how one would do that directly.

But, at any rate, there's still no reason in principle why one couldn't ask people what they would be willing to pay for improvements in various local public services.

One comment on that. Again, there are all these problems we know about in the CV literature in terms of defining what the good is. That's certainly a problem that would be present here as well.

We would be asking people for what they would be willing to pay for in improved quality of schools. Well what do you mean, improved? Test scores or improved safety in their communities?

Again, how do you interpret that.

Some reduction in the probability of being victimized in terms of certain crimes?

These things again are not easy to quantify.

One suggestion here, however, is that instead of using final outputs, such as degree of safety, or test scores for which we don't really have a very good idea of the production functions anyway, one might take a step back and use what are called in this literature direct outputs.

That is, think about things that are inputs to the provision of these final consumer goods. Things like the frequency of police patrols, teacher/pupil ratios and things like that.

One could presumably ask willingness-to-pay questions about things like that. How much would you be willing to pay to double the frequency of police patrols in your neighborhood. How much would you be willing to pay to cut pupil/teacher ratios from 30 students per teacher to 20, and so forth.

In fact, these link in in rather direct ways to budgetary decisions. And it strikes me that there might actually be some sort of interesting possibilities along this line for employing the contingent valuation approach.

Okay, to sum up then, it seems to me that in principle, at least, the collective choice approach does have some appealing characteristics as far as use in evaluating environmental amenities.

One, it deals with observed outcomes and, two, it in principle encompasses non-use values. So we've got an RP technique that includes non-use values.

As I've tried to suggest, however, there are a lot of problems here because of the way in which this methodology has been tied into local budgetary processes. And I think we have to think hard about the kinds of environmental goods that are mental candidates for the application of this technique.

So I think I'll stop here and turn it over to the discussants.

DR. PORTNEY: Wally, thank you very much for getting us off to a great start. It's my pleasure to introduce, as the first discussant, Maureen Cropper. Maureen Is currently a principal economist in the research department at the World Bank.

But she's there on leave for two positions. She's a colleague of both Wally's at the University of Maryland, where she's a professor in the department of economics, and of mine at Resources for the Future, where she's a senior fellow in our Center for Risk Management. Over the past half-dozen years or so, I don't think there are many people in environmental economics that have produced as many seminal articles as Maureen has. And as partial testament to this fact, she's the President-elect of the Association of Environmental and Resource Economists.

Let me turn the floor over to Maureen.

Though we are colleagues and good friends, we have mutually agreed that she's on her own in terms of fixing up this microphone.

DR. CROPPER: In my comments on Wally's paper, which I think is a really excellent review of the collective choice literature, I'd like to focus on two questions that Wally raised.

(Slide.)

The first question is can the collective choice approach be used to estimate the demand for environmental quality.

As you will see, I think my position on this is a little more negative than Wally's position, and I'll spend some time to explain why.

The second question, which Wally didn't spend very much time on, but I will spend a little more time on; is can contingent valuation methods be used to estimate the demand for local public goods, the things we usually use the collective choice approach for, such as expenditure on public schools or safety.

On this question, I think I'm actually a little more positive and I guess in general, I think that indirect or revealed preference methods can benefit greatly from inputs from survey research.

As Wally pointed out, if you're going to use the collective choice approach to value environmental amenities, two conditions have to be satisfied.

(Slide.)

First of all, you have to identify enough jurisdictions to do a statistical analysis where people really do have control over environmental quality. Then you have to measure the marginal cost of environmental quality to each citizen or whoever it is we think is going to be influencing the decisions on environmental quality.

And I think there are basically three problems in achieving these two conditions.

(Slide.)

I'll discuss each in turn.

One problem is that people's influence over environmental quality is really very much less direct than it is over things like school budget. There are dimensions here today of cases where people really do vote on environmental quality because they determine the amount of expenditure and local parts.

Some times there are referenda that limit development on coastal areas for environmental purposes, things like that. But as we all know, most environmental quality is determined through environmental regulation, that is, through standards that are put on emissions that firms can discharge into the environment.

That's what determines air quality, that's what determines water quality. There are regulations on the disposal of hazardous waste by firms, and so forth.

So most of environmental quality I would say is really determined by regulation. And although in a democracy, we feel that citizens influence the outcome of regulations, there's no real theory, I guess, that I know of, certainly not a theory as well-developed as the theory of the median voter to explain how citizens influence environmental quality.

So that really leads, I think, to a problem, because you don't have a model that you can readily use to say how it is that people's beliefs or demands for improved environmental quality actually are translated into regulation or are translated into court decisions.

On this first point, I think there is also a certain inherent problem in using the collective choice approach to value environmental quality.

Most of the people who are here to do contingent valuation studies are doing them for normative purposes. They want to get an estimate of the value of improving PM-10 or SO2 levels for a benefit cost analysis, or they want to value natural resource damages in a court case.

The reason these normative studies have to be done is precisely because, in these cases, people don't have a direct input into determining environmental quality. If people had a direct input, if they were voting on the amount that Exxon should pay in terms of damages, you wouldn't have to do the study, okay.

So there's this sort of inherent contradiction that in the cases where you want these very precise estimates of the value of damages, these are the cases where people are not directly having any collective input into the decision, and therefore it's hard to use the collective choice method.

And in the cases where people are directly voting on these matters, at least for the normative purposes that I think people are interested in here, there is no real need to do this kind of normative analysis.

That, I guess, brings up another difference between I think the literature on collective choice approaches and what people do in environmental economics. A lot of the literature in collective choice is really positive in nature.

If you go back to the original Bergstrom and Goodman article, the idea there is to see how expenditures on local public goods, such as education, vary with median income, with the size of the community, with how broad the tax base is.

Those are all important questions to investigate, but they're very different in determining a precise value on a commodity for the purposes of a benefit cost analysis.

Wally also mentioned this limitation, and I guess I think it's a pretty severe one, that people's control over local environmental quality is very much limited by federal and state laws.

Wally mentioned that, for example, for the National Ambient Air Quality Standards, for particulate sulfur dioxide, nitrogen oxide and so forth, these are set at the federal level. It's not just those that are set at the federal level but for all new sources of these pollutants, the number of pounds pollution you can emit per million btus of heat input is set by the federal government.

The amount of BOD you can discharge per thousand pounds of poultry emitted is determined by EPA.

Regulations on how hazardous waste is disposed of under RCRA are again federally determined.

And the list goes on.

There are cases where, of course, well, in all cases, states and local governments are free to set more stringent environmental standards than the federal level, and there are cases of course where that's been done. But you have to have enough states that are doing this or enough metropolitan areas that are doing this that you actually could do a statistical analysis using that number of observations.

It's also the case that states have the responsibility for enforcing federal environmental laws, and you could say, well, maybe they have some control in that sense. Again, EPA has the right to take over enforcement in cases where states really are flagrantly violating federal and non-metal standards.

So there may be cases, and in my paper, I suggest maybe PM-10 is one case where indeed you do have most of the areas of the country in attainment with the NAAQS, the national standard for PM-10, but you still have to deal with this issue that the new sources are still being controlled by EPA and in what sense do we really think that local citizens are telling or how are they telling people at the state level, I want a PM-10 level that's 50 percent below the federal standard?

Okay. This last issue, I think, is really one of the key issues, and Perry Shapiro is going to talk about this also.

There is this problem of how do you measure the marginal cost to whoever it is who's influencing this decision. We haven't really determined who that is. But how do you determine the marginal cost of environmental quality?

(Slide.)

What Wally is suggesting here, I think, in terms of an estimation technique is something like this. What we'd like to measure really is the marginal damage people associate with particulates. In this case, the example here is PM-10 on the horizontal axis. It's measured in micrograms per cubic meter.

And the marginal damages which increase with the ambient level of particulates are really, if you go down the curve the other way, the benefits of improving environmental quality.

So we really want to measure this marginal damage function and what I think Wally is suggesting is that if we really can measure the marginal cost of controlling particulates in different communities or different metropolitan areas, then what we're going to observe here, the prices and quantities will be the points along the intersection of these curves.

And identifying this marginal damage function is going to be a standard exercise in identifying a demand function, given shifts in a supply function. And, subject to certain restrictions, we can possibly do this.

The point is, though, and I think also Perry Shapiro will emphasize this, that prices here, and you really have to get them right, are these marginal costs of control.

The question is how do we measure these.

There are lots of engineering cost studies that actually look at the marginal costs to firms of controlling particulates. If you assume that in a community, you go from the lowest marginal cost sources to the highest, you could actually construct these sort of step functions that you see all the time, based on engineering cost estimates as to what the marginal cost of controlling PM-10 is.

But PM-10 isn't controlled that way; it's controlled through a variety of federal regulations. There's also the question here of is the control cost the cost to the firm at the margin who is removing the last ton of particulates from the air? Is that cost going to be passed on to people in other communities?

It's going to presumably be reflected in terms of reduced profits, increased prices, reduced wages.

How are we really going to figure out how people are perceiving this marginal cost?

And I think that's really the problem here.

If what you're interested in doing is some kind of positive analysis, where you're willing to say, okay, I think in some vague way that people influence the level of environmental quality, I can measure things that will shift the marginal control cost function across communities, like the composition of sources or meteorological conditions.

I know what shifts those curves. I think this demand for environmental quality is affected by population size and income. And I want to try and sort of tease out something in a very positive fashion about how the demand for environmental quality varies with income.

I think maybe you can do that, but that's a very different matter than getting a precise estimate of the value of additional reductions in PM-10 for a benefit cost study.

In the paper, I go through a series of environmental goods, environmental amenities and discuss, in turn, why I think there are problems in either measuring the perceived control costs, or in considering people to be in control of these levels of environmental quality.

I don't want to be too pessimistic, but I guess the only cases that I can think of where this approach would really be profitably or reliably applied is in the case that everyone's mentioned, which is expenditures on environmental goods, things that are actually on budget items. And possibly in a case of controls on the levels of sewage treatment.

There has actually been a study by Ginny McConnell and Greg Schwartz that uses observations across communities to look at people's demand for various standards of sewage treatment. Even these are restricted under the Clean Water Act. All municipalities have to have at least secondary treatment.

But this is something where the cost to people of sewage treatment is somewhat salient. You're billed for it. At least you can argue people know what it is, and it is something over which there is some local control.

But I personally have a hard time thinking of other examples and you can maybe move from this into the realm of things where you could do some positive studies in the case of air quality, and seeing if the demand for air quality, in some very lose fashion, increases with income.

Then you move on to cases like natural resource damages and valuing endangered species where I guess, to me, it seems impossible to really use this approach.

The second part of my comments are dealing really with this micro-collective choice approach that Wally briefly mentioned and goes into in some more detail in the paper.

As Bergstrom and Rubenfeld and Shapiro pointed out in a 1982 Econometric article, one of the advantages of using surveys in the area of valuing local public goods is that you don't have to rely on the median voter assumption. You can go to people who have a demand for local public goods and you can ask them about it.

And one of the interesting things, I think, is to look at how this survey approach, which is based on hypothetical questions, has been used by people in this area, and to contrast it with the contingent valuation approach.

I think the reason this is interesting is that even when the collective choice approach is implemented using surveys, it still remains somewhat like a revealed preference or an indirect method of valuing environmental quality. And the reason it does it that it makes certain assumptions about the way in which people perceive prices and quantities that may not be justified.

And I think, to make that clear, I'll just have to get into an example here.

Wally actually gave you this question already, but I thought I'd put it up so you could look at it.

(Slide.)

This is a question asked of 2001 Michigan households in a survey conducted in the late seventies. If I get anything wrong, Perry Shapiro can talk about this, since he's a coauthor on the article with Rubenfeld and Bergstrom.

Actually, it sounds to me like this survey was analyzed by lots of people. I don't know actually how many surveys have ever been done in this area because this one is the one that's always analyzed in the literature.

But, okay, here's the question.

Do you think the state and local governments should be spending more, spending less, or about the same amount on the local public school system as they are spending now?

Sort of what people in CVM would do as a warm-up question. If people say they're willing to spend more, they get this follow-up question. If your taxes had to be raised to pay for the additional expenditures on local public schools, would you still favor an increase in expenditure in this area.

If you say, yes, then you're counted as. wanting more expenditure.

As I recall, 58 percent of the people wanted the same amount, and some wanted less. The question is, how are we going to use this information. The answer to this very easy question.

I will give you what I think is the contingent valuation counterpart to this question in a minute.

This is a pretty easy question to answer, okay.

So how is this going to be used?

(Slide.)

The assumption here is that people are going to compare actual expenditure per student in their school district to their desired expenditure per student. And desired expenditure is going to be parameterized, it's going to depend on the respondent's income, on his tax price, on the cost to him of raising expenditure per student by one dollar, on taste variables and so forth, on U as an error term.

This is going to be compared to actual expenditure per student and your desired expenditure has to exceed actual by some difference because, after all, there's going to be a lot of people here who actually don't want, whose desired actual expenditures are in some sense close enough that they don't want to change, okay. So there has to be a big enough difference here.

So what's going to happen here is that by estimating an order of logit model, this is only outlining what's done in the article, the authors are going to be able to estimate D, the vector of B, and the standard deviation of the error term.

Now, what I guess I think. are the drawbacks of this approach is that instead of asking people what do you think actual expenditures per student are in your community, these are measured objectively. This is the standard indirect approach.

You do an atonic wave study and for at least 99.99 percent of the atonic wave studies that have ever been done, take objective BLS estimates of risk of death on the job, as opposed to what people perceive as their risk of dying, there are very few exceptions.

In computing the tax price that the person faces when he makes this decision, they asked the respondent what he thinks his taxes are, which I think most of us who pay property taxes could answer. But then they take the size of the tax base in the community to divide his estimate of taxes by. Then that has to be multiplied by the number of students in the school district.

While I live about half an hour from here in Bethesda, Maryland, I know what I paid in property taxes last year. I don't have a clue what my tax share is in Bethesda, nor do I know how many students are in the school. district, and I also don't know what is the expenditure per student. And I have four kids.

So, in any case, I think that it's a hard argument to swallow that people really perceive these things, and part of the evidence that maybe they don't really, their perceptions don't match the objective measures of the variables is that in estimating the coefficient on this actual expenditure, which is one over the standard deviation of the error term, and is needed to identify all the other coefficients, that is actually very imprecisely measured which at least could be because people really don't have any idea what these actual expenditures are.

It seems to me that the advantage of the direct questioning approach is that things like what quantity it is that you're buying, if you like, and what you're paying for it, are made more explicit.

(Slide.)

Now people who write contingent valuation questions, and I'm not really one of them, probably will wince when they see the wording here, but the idea is, I just want to give you an idea of how you might ask, in a contingent valuation survey, people's willingness to increase expenditure per pupil.

I know people don't usually value expenditures or talk about the expenditure per pupil kind of thing in a contingent valuation survey, but there's no real reason you couldn't.

In this literature, it's just an index of quality, so here's a possible wording. Currently, expenditure per pupil in your community is so much per year.

Maybe you don't even want to tell people that.

Suppose that this were lowered to some very low amount because, after all, we have to go from a low base to see how much people really want to spend per student, and that your taxes were also lowered by some amount.

Would you be willing to pay some stated amount in taxes in order to raise expenditure per student to some amount that's also given to the respondent.

Well, there are lots of amounts here. And I think that if you look at this question, and I'm sure it could be worded better, it's a harder question to answer than just saying, I want more, or the same amount, or less spent on schools or expenditures per student.

And Wally, in the paper, is somewhat critical of that fact. But the criticism is only illusory because, after all, you're assuming in this indirect approach that people are going through the same mental calculations as they are here, as they are explicitly being asked to go through here. The only big difference is you're not just testing that assumption, you're just making that assumption. And if you get imprecisely estimated coefficients, maybe that casts some doubt on it.

But at least here you are saying something to people about explicitly what it would cost them, what it would be raising expenditure per student to, and as I say, if the person can't answer this question, it strikes me that perhaps the assumption that he can in the other method is unwarranted.

As I guess I said at the beginning, generally speaking, in the use of indirect approaches, one is based on observed behavior. Of course, here, we're using a survey even for the indirect approach, but one is based on observed behavior.

That there is this big drawback that to make inferences about non-market goods from these. You have to make a lot of assumptions. They're not tested. They could be tested as survey techniques or combined with indirect methods.

And so, I think for that reason, I'm actually sort of more confident about my answer to the second question, that indeed contingent valuation might actually help the collective choice approach more than I think the collective choice approach can help valuing environmental quality.

DR. PORTNEY: Maureen, thank you very much.

Our next discussant is actually two discussants. Two tan smart guys from Santa Barbara who will divide their time.

To my far right is Bob Deacon. Like Perry Shapiro, who will follow him, Bob is a professor of economics at the University of California at Santa Barbara. Two years ago, he was a Gilbert White visiting fellow at Resources for the Future. I can say that I cut my teeth in economics in local public finance. In the early 1970s, every time I had an idea, I found out I was about two or three years behind Bob Deacon and Perry Shapiro.

In 1972, Bob Deacon and Tom Borcherding published a very influential article in the American Economic Review. In 1975, Bob Deacon and Perry Shapiro published another article sort of expanding and elaborating on this notion of using the median voter local referenda to shed light on the value of public goods, so both are eminently qualified to give their responses to Wally's paper.

Let me turn the floor over to Bob Deacon.

DR. DEACON: Thanks a lot, Paul.

Perry and I were doing a sort of Alphonse Gaston routine and I came up Alphonse with a flip of the coin.

I really wanted to talk mainly about public choice models that apply to jurisdictions, rather than individuals in the sense of using jurisdiction-wide data as opposed to individual data.

Then Perry will talk about the models that focus more on individual information.

I really have a lot of agreement with what Wally had to say. I thought he did a great job of summarizing, especially the median voter models. That's not surprising. Public choice economists tend to think pretty much alike on these sorts of things, which probably accounts for the fact that we both showed up today wearing exactly the same costume.

(Laughter.)

DR. DEACON: It's the public choice uniforms. You ought to see the meetings; red striped shirt, red tie, tan slacks.

(Laughter.)

DR. DEACON: I think the public choice approach has generated a lot of useful information or information that can usefully inform the collective choice process. I think it has generated a lot of useful information that can inform the policymaking process.

I'm somewhat more skeptical than Wally appears to be in his paper regarding how readily it can be adapted to valuing public goods or environmental goods in particular. But I think there are some possibilities.

I really wanted to focus just on two things before I turn the mike over to Perry.

One is what are the bounds that we can place on the kinds of problems that collective choice approaches can be used to answer.

Maureen has covered a lot of that ground, so I'll be very brief there, and I don't have that much to add to what she said.

But the second question is, what are our areas of uncertainty within the public choice literature, and sort of what areas, if we were going to take this seriously, what kind of areas need additional research.

Let me begin. I think that the collective choice approach has generated a lot of useful information. Particularly, it's sort of convinced at least the people that work in that area, and I think perhaps some policymakers, that jurisdictions do make responses to changes in relative prices. We see this in a lot of ways.

When the price of a service goes down, jurisdictions tend to supply more of it. The price can go down because prices may vary across jurisdictions, perhaps because inputs cost different amounts. Public wages are slightly different in different jurisdictions and we see this showing up in the expenditure patterns, and it's easy to interpret that as a price response.

We also see that jurisdictions adjust service levels when their outputs are subsidized. They also change expenditure levels in predictable ways when the composition of the tax base changes.

For example, if my jurisdiction winds up being able to export a lot of its taxes, then the evidence says that, on average, we'll have better 'schools and public parks than the jurisdictions that have to pay their own way completely.

So anyway, I think that it has provided a lot of useful information but we really come down to the question, can it provide us a magic number that we would think of or interpret as the value of a particular non-market good or service at levels that it's consumed at.

Then I think I'm much more skeptical, at least about our ability to use currently available information from the collective choice literature to answer those sorts of questions.

To begin then --

(Slide.)

-- let me just put up something that appears in the paper, a set of questions that were intended to kind of draw some bounds around the sorts of valuation questions that the collective choice approach might be applied to.

I just pose three simple questions that are somewhat in line with the kinds of questions that have been addressed in contingent valuation studies. And for each of these three public issues, I posed two related research questions.

Number one, can you go to the literature right now and find off-the-shelf estimates that would allow you to answer any of these?

And number two, if that's impossible, can you think of ways of patching up the collective choice approach or maybe modifying it in some fashion to allow you to answer this question?

So the first issue here that is kind of a species or wildlife protection issue having to do perhaps with extinction, what's the value to the citizens.

The second is an air quality example, and both Wally and Maureen have looked at questions of that sort.

The third has to do with something that's much more garden variety, providing a public park.

Now, in some intuitive fashion, these questions get easier to answer as you go down the list. At least, in some sense, the goods are more tangible and, at least from a collective choice point of view, you get much closer to a good that is provided by a single jurisdiction.

So the question then is, I asked this first question with regard to all three of these issues, I tried this on myself, and I found that I had to answer no in each case. I don't think we can go through the literature and find off-the-shelf estimates that would allow us to come up with that magic value number for each of these policy issues.

The second question, is this a researchable topic, is something that we might hope to repair in the future. I get two noes and a maybe.

Wally and I may disagree about this, but I think on the second item, I would say clearly. On the second, I think the answer is probably no.

I don't think we could produce an estimate that I would be comfortable with, largely for the reasons that

Maureen explained.

On the third, I think it's researchable, but I don't think at the present we've done the kind of research that would allow us to ask that.

The public choice approach, I think, has gone in a positive direction, trying to understand the kinds of price responses that I described earlier, and has not really gone toward valuation issues.

Now, it may be possible to massage it a little bit and push it off in that direction. We can talk about that later. I'll have some things to say about that.

So why do I think it's so difficult to value something like a public park, given the information we currently have?

And what, by implication, would be the kind of work we'd need to do to repair this?

Well, the main point I want to make has to do with tax prices and our uncertainty regarding what tax prices actually are.

(Slide.)

This is a little overhead that says the importance of knowing the tax price precisely. I basically took the standard median voter model, equation one, and I simplified it by setting the population equal to one. It's not a very interesting jurisdiction but it doesn't matter. It kind of clears away some of the brush here.

So we set the population equal to one. Set the marginal cost, that was the capital P in Wally's equation equal to one, then we just took the simple representation here and we can invert this like I do in equation two to get a marginal rate of substitution on the left hand side. That's basically the price variable.

In this case, it would be the lower case t. I just sort of flipped things around and turned it inside out. We find that the marginal rate of substitution can be expressed as a function of these two variables, E and Y, as well as the parameters alpha, beta, and most crucially I think, although surprisingly perhaps, the parameter A is a constant term in the demand equation.

The reason why I think the constant term is problematic here is that we typically don't observe the tax price precisely. I think we have things that we believe are correlated to the tax price, things like the percent renters, maybe the wage rate of public servants, which kind of indicates cost differences.

The percent of commercial and industrial property in the tax base and so on, which kind of indicates how much of the taxes can be exported.

So we might have something like S down here which is correlated with the tax price, and maybe the appropriate index, as I've got it here, it's just proportional but we don't have the T exactly.

If we have something that's correlated with the tax price, we can plug it into this regression equation and get a model that we can estimate. We have, on the right hand side, observable quantities. S might be some tax share that we think is correlated with the real tax price. And we can estimate alpha and beta without any error.

There's no bias involved there, but notice that we're getting a constant term. Instead of an A term, we're getting an A plus this theta plus an alpha term. The problem here is not with estimating elasticities. We get those exactly right.

In fact, we compared these elasticities across studies and they all would sort of agree with each other. There would be no biases, sort of no omitted variable, except for this constant theta which obviously isn't correlated with anything.

So there's no biases in the elasticities but we can't identify the little a, and notice that I need the a to get the marginal rate of substitution. It's kind of like we can get these proxies for tax price, and figure out how the demand curves slope, but we don't know where the intercept is. We don't have a point that we can draw them all through.

I'm not saying that's impossible; it's just that the way the literature has developed, we haven't really tried to identify that. We're more focused on price responses and on the elasticity.

I sort of got into this by asking, suppose we're going to build a park in Santa Barbara, and I was trying to figure out my own tax price. It would depend on a lot of things.

I don't think I could figure it out. I didn't even know really what tax is marginal to the city. When it needs to raise an extra dollar, does it balance its budget with a property tax? That's the standard assumption in the collective choice literature, but I think it's largely untested.

I think, a lot of times, jurisdictions, when they need an extra dollar, they might raise user fees a little bit. We have an option to raise the sales tax a little bit locally for certain kinds of actions, or excise taxes.

I'm not really comfortable necessarily with the idea that the property tax is the marginal revenue source and therefore we ought to be building tax prices around that idea, even though that is assumed in the literature.

I think it's researchable but it hasn't yet been researched and integrated into this literature.

Number two. What kind of tax liability do I bear on property that is commercial and industrial?

We have a lot of tourists that come into Santa Barbara to T-shirt shops, and they buy T-shirts, and this partly supports the property tax payments of those establishments. So am I really exporting or are all those property taxes on the T-shirt shops getting exported out of the jurisdiction to other citizens, people from elsewhere, Washington, D.C., perhaps?

This is important because some of that 46 percent of the property tax base in these jurisdictions nationwide is commercial and industrial, not residential, so we need to have some sense of what the incidence of those taxes are.

There have been a lot of incident studies. It‘s not that this hasn't been researched. It hasn't been researched and integrated into this collective choice literature.

Another thing that sort of occurs to you is if all these people that are coming into buy T-shirts and go to the beach in Santa Barbara, aren't they also receiving some services. If they are, then maybe the N that we're using shouldn't necessarily just be the population of the city, but maybe we're providing services to some of these outsiders.

These are all things I think are important for trying to figure out how to interpret this in terms of values to the citizenry. They are researchable Questions, I think, but they aren't things that we've focused on yet.

Then the renters' question, Wally has a great deal on that and sort of goes through how renters perceive taxes and tax prices, so I don't really have much to add on that.

Anyway, if you look at the literature on the median voter model, there are a lot of different specifications for tax price that people use. They are all typically kind of related to the property tax idea, that that's the marginal source of revenue. But in some cases, they're assuming that all commercial and industrial taxes are exported; in other cases, they're assuming they're not.

In some cases, they assume that renters pay their way in terms of property taxes. In other cases, they assume that renters don't bear any part of the property tax.

Again, all these incidence questions may have a public finance theory to handle this, but it hasn't been applied or directed toward these collective choice studies. I don't think that's necessarily the fault of the collective choice literature because if you're just trying to answer the positive questions, what happens to expenditure and service levels when the tax base changes, this model is fine.

It's just that, a) you don't get that valuation, you don't get all the parameters you need to value these services.

There's one other thing in the paper. I have a couple of more overheads. I'm going to have to kill this off, but that is the main point.

One other thing that I wanted to say was that if you tried to take the estimates in the literature and apply them to understanding estimating the value of some public service, you're going to have to plug in this little congestion parameter, alpha or gamma.

So you're going to have to have an estimate of that if you want to figure out or estimate what the marginal value that the citizen places on this service is.

All the estimates of gamma range around 1.0 but there are standard errors associated with those. And it turns out that the marginal value you would place on a public good is really very sensitive to the exact level of gamma.

(Slide.)

If it's 1.0, and we get a marginal rate of substitution of marginal value equal to one, it turns out that for a jurisdiction of 10,000, that drops down to .95. The marginal rate of substitution implied by the estimates is only a third, 33 cents, rather than a dollar.

So we have a lot of sensitivity to the actual level of the gamma. And if you look in the literature, the gamma is estimated with fairly generous standard errors.

So this is something else that we would have to be a lot more certain about, I think, before I at least would be comfortable with applying this.

If you got the paper just yesterday morning, then you also got the version that has all the latest typos, and I apologize for those.

The most egregious one, and I can take responsibility for it, oddly enough, my name slipped off the front page, so I have no apparent connection to this paper.

(Laughter.)

DR. DEACON: But despite that; I decided to talk about it anyway. And Perry, now, is going to finish it off,

DR. SHAPIRO: I thought I would talk about the microestimates of public goods and in fact I think this is probably the closest that it comes to this kind of public goods collective choice approach, comes to the CV approach which we've been talking about.

I really do appreciate Wally's comments. I think actually, while being one of the people who started this micro-estimation technique for the public goods, I think that the CV techniques being developed have really more to offer to us than IVU.

But let me talk about this approach, and tell you, I have a sense -- I'm not only new to this area, I have no connection with any of the CV controversy. I'm untouched by any of the tensions that I sense in this room. And so I don't really have a stake in it.

I'm going to talk a little out of school too, so if I repeat things that people have said, I apologize.

But it seems to me that the difficulty that you're having here, outside of potential income gains with one group or another, has to do with trying to move from the positive to the normative. That's been said.

You're really looking for welfare measures and in a way, a lot of us have promptly sat in front of classes and explained probably one of the most beautiful results of social sciences in the 20th century; namely, the impossibility theorem.

And somehow we never take it to heart. It doesn't exist as a social welfare function, but we're going to try to find one anyhow.

Let me tell you my attempt at this, and this is really using the survey that Wally was talking about, but kind of turning it around.

Again, people ask whether they want more or less or the same public good.

(Slide.)

A lot of people, I'll reveal the whole story on one slide, so if you want to. read ahead, you'll know what I'm going to say.

The essential part of us started out by saying, look, there is a likely substitution function. That's just an inverse demand function which is linear or log-linear, depending on the specification, depending on A being the actual level of expenditures, and X some vector of characteristics of the standard model.

Then there's a survey response, and here, what I sense here, and I really have done limited reading in the CV literature, we have a model of consumption, and we're comfortable with getting demand studies, market demand being inverse demand functions, and computing welfare triangles.

But it follows out of some model of what behavior is, and it strikes me that there's got to be some model of survey response too. To what extent that's been done, I don't know. I'm not an expert in that.

But implicit in what I've done, there's some model of survey response. We've asked people whether they want more or less or the same of the public good; education mostly.

If they answered "more," it was assumed that the model was that if their tax price T, the price they're actually paying -- and there's problems with observing that admittedly -- was sufficiently -- and this is really rather important -- is sufficiently larger than their marginal rate of substitution --

I'm sorry, I've got that turned around.

The marginal rate of substitution is higher than the tax price, turn all the signs around, all the inequalities in there, excuse me. If the marginal rate of substitution were larger than the tax price, then they'd answer "more."

But it had to be sufficiently larger. And the point is, is this delta term, it has a rather loose connection from psychology, because I have a rather loose connection with the field myself, that this is related to the notion of psychology of just noticeable differences.

And there is a literature on this, and a rather nice one. In fact, formalized rather eloquently I think by Dr. Moosbeck in the fifties. The theory of semi-orders.

There is a welfare economics that is associated with semi-orders and the responses that I get, this came for purely practical reasons. When I did my first studies here, a lot of people said, well, we want about the same of what they got.

That's a little hard to explain if you think you have a continuous random variable, you would expect to find that with probability zero, but in fact, as Wally said, in studies we found over 50 percent of the people said they were happy with what they had. So the practical reasoning was, what's going on.

One way to explain that is that there was just imprecision in the perception of preferences and perhaps of what the real alternatives are.

If epsilon is even a probit model or logit model, they are all about the same, they have the same set of properties, the usual outcome, and this is the probit model, P being the cumulative density function for the standard normal distribution.

The point about the things that I did was it was well-known that most of the parameters would only be estimated up to some constant proportionality, namely the variance or the standard deviation of the error.

But in fact, with the identifying restriction in this case, the coefficient on that, the tax price here, which is presumably observed, is equal to one. And if there's variation across the sample in T, then the sigma would be identified, and the three-response model allowed the identification of the parameter of imprecision, namely, delta.

But let's leave the model. It certainly looks a lot like a number of the CV models that are being estimated now. Again, that's in the literature.

Let me just tell you, I'll give you this model, and we've estimated a number of things on the basis of this one survey.

I envy the people doing this environmental stuff. Surveys, as you know, are very expensive to mount, your funding is probably a lot higher than mine, so I deal with the data I have.

But let me just tell you, I did do a welfare measure on this. There is a well-known welfare criterion, an efficiency criterion, namely that the sums of the marginal rates of substitution equal the marginal cost. This is by community.

This is now the expenditures on public education K through 12.

(Slide.)

Let me tell you again how that was done.

The first equation is of course the marginal rate of substitution equation, but for individuals, which we presumably estimate.

The estimate of the community marginal rate of substitution for some is going to then just be the second equation.

This is the third equation on this now, where the estimated values of the parameters are substituted in here using QJ being the quantity of the public good in the local public sector; i being the average. These lines over the variables are averages for the community and these being community values.

So this is actually a welfare comparison. This is for dollars of expenditures. So the marginal cost of a dollar of expenditure on this public good, which we define in the perpendicular way, is of course a dollar.

The thing we find is that for the State of Michigan, where this was done, the average value for this sum, this welfare arrangement, was .75. So the conclusion might be that, yes, this could imply that the sum is smaller than the marginal cost, and there's overspending on education.

So that's been a welfare conclusion.

Interestingly enough in this, this relates to the potential mismeasurement of the tax price. It corresponds rather closely, not perfectly of course, but rather closely to what the residential share of the taxes are in Michigan, the implication being that this welfare measure is right.

First of all, the implication might be that actually the public process, at least in this case, leads to an efficient outcome, a local efficiency anyhow, wherein the local officials are responding only to their own prices.

Let me suggest -- let's see, what do I have here now -- I've been on this for nine minutes and 50 seconds -- I've got about ten seconds to do a little zinger here.

I was giving some thought to this summing up. I mean it does seem to me that the CV people are trying to push this very hard into the normative area. And there is some criticism about this.

They shouldn't do these potential violations of various rationality conditions or conditions that we usually impose on preferences. It seems to me that one ought to be thinking perhaps about well, I don't know to what extent you find this summing up condition violated, but if that's what's happening, that's what's happening.

And is there a welfare theory that is consistent with that observation?

It seems pretty interesting to me -- I don't know how robust it is across samples -- it seems to me that while this may not be the one, certainly if there is some imprecision in preferences, that there is a potential welfare theory here.

I again only operate as a suggestion, so the collective choice people ought to come up with something. I really feel this whole area has been better developed by the CV folks.

The idea here --

(Slide.)

-- is that really this imprecision can be modeled as thick indifference curves. Rather than thinking of having precise demands, these are sort of clouds of indifference. And I hate to tell you, this is a theory of semi-orders.

One could really think, supposing that we've got two levels, you're saving one bird or two birds or the river is half polluted or fully unpolluted or something like this, and you sort of ask, would you pay for that.

Well, one idea would be well, if there is this level of difference, what sort of model of response would you give.

A reasonable model, it seems to me, maybe not the only one but a reasonable model is that you would have equal probability of answering anything. The point here is that it would be this whole thing bounded by the two vast indifference curves are the indifference areas. There might be an equal probability of getting fifteen dollars or anything in the potential range of possible outcomes.

Now what's that? There's an interesting potential welfare model there. Whether it's useful, I don't know.

I am the last speaker for the program and I do feel like the fat lady, but I don't have a good place to sing.

(Laughter.)

DR. PORTNEY: Bob, Perry, Maureen, Wally, thank you. I think what we'll do now is take a very short fifteen-minute break. Please be back here at 11:00 o'clock. We'll have a half an hour of discussion, give you an opportunity to ask questions of Wally, Maureen, Bob and Perry, then we'll sort of turn to the final wrap-up.

So back in here at 11:00 o'clock, please.

(Applause.)

(Recess.)

DR. PORTNEY: Thank you very much.

I'd like to get started here with our discussion.

I'm going to begin by giving Wally Oates and opportunity to respond to Maureen's, Bob's and Perry's comments.

DR. OATES: I'd like to thank the discussants for their very thoughtful and insightful comments on this.

I'd also like to thank the organizers of the conference.

This paper, which is in pretty rough shape, and I have a lot of second thoughts about following the helpful comments from the group, but this paper tried to bridge, tried to draw a link between two literatures in a way in which I don't think any of us have thought about before.

And it made me think hard about the possibilities for using these two methodologies in ways that there might be some interesting cross-fertilization.

But as I say, I think the conference itself has been very helpful in terms of pointing to some avenues in research that we really hadn't picked up on before.

But as I say, I hope you'll read the draft of my paper. I'm actually a little uneasy with certain things about it, but it in part reflects the fact that this is the first opportunity that I've really had to think about the relationships of these two methodologies

I thought the comments of the discussants were very helpful on this.

DR. PORTNEY: Wally, thank you very much.

I've got one announcement to make, and then I'll turn immediately to questions from the floor.

The announcement is that apparently the hotel is full and so what they would like you to do is check out, try to adhere to this 12:00 o'clock checkout time. If you do so, you can bring your bags down and store them out here. There will be people here to keep an eye on them. Then go to lunch, which will be served promptly at 12:00 o'clock, and I'm assuming it's the same area where we had lunch yesterday.

Let's begin the discussion from the floor, and I'll open by recognizing Jonathan.

VOICE: I'm wondering whether the collective choice approach for measuring the value of things like species or forests could be improved by using nations as a unit of analysis.

Anyone can answer that.

DR. PORTNEY: Well, we're all thinking about what the tax price for Burundi or something would be.

Bob, would you take a crack at it?

(Laughter.)

DR. DEACON: I'm actually doing some work at looking at how resources are used across country, a cross-country study of forest use. One of the things it turns out that is of interest -- I'm not saying anyone can use this for valuation -- is that the form of the government, whether it's a democracy as opposed to a dictatorship or a protectorate, does seem to matter.

Whether that's reflecting different political equilibria in different systems, that's what I'm mainly interested in.

I really have doubts I guess, myself, as to how far we could go with getting a value number from cross-country studies. But on the other hand, I think it's an interesting thing to study perhaps for other reasons.

DR. OATES: In principle, there's no reason why one couldn't do that so long as the sort of benefits from the good that's under consideration are pretty much national things. That's the way a lot of the local public goods things have to do with spending and decisions on issues which are local in character.

So if we're talking about a national public good, say, there's no reason in principle why you couldn't identify the cost to the nation and employ this procedure.

DR. DEACON: Let me just follow up and say, I think that's right. That's the kind of work that's been done on environmental curves by Kirby and Roseman, which is certainly going in that direction.

I think we're getting things that are correlated with demands across countries. It certainly makes a lot of sense to me. Whether or not we can actually come up with a number that we could attach to that and comfortably call it a value or a value function, I'm a little less certain about.

DR. PORTNEY: Glenn Harrison?

DR. HARRISON: I'd like to briefly mention something that a doctoral student of mine, Ann McDaniel, is working on and get your reactions to it, because it seems to me related but different.

She's interested in the question, is there a mismatch, a political disequilibrium in a county, Richland County, and Columbia. What she's doing is using a contingent value -- it's not a contingent value, it's a hypothetical survey -- to try to elicit true preferences, and then see if the political gerrymandering that's going on is along racial lines in Richland County, and explain the mismatch between the true preferences and the delivered services in that community.

In a sense, she, couldn't go backwards from presuming political equilibrium. She has somehow to elicit preferences. What she's doing there is I think quite innovative and exciting. She's using the dominant strategy mechanism in a voting booth. She's using a probabilistic voting rule which is actually a good random dictator. It's very simple to explain to folks. It doesn't suffer from any problems in terms of eliciting true preferences.

Then she's plugging it into what is actually played in the political voting game, which is a plurality type game which leads to all sorts of strategizing. Then she can see how the true preferences elicited by this survey differ from the revealed outcomes in the community.

It seems to be sort of almost diametrically opposite in terms of what the collective choice approach has been, but it suggests that it might be, in some sense, a more fruitful way to use hypothetical surveys.

And one final thing I'll mention, don't mention this to anyone else --

(Laughter.)

DR. HARRISON: -- it turns out that there is almost no hypothetical bias in this. Don't tell anyone else that.

DR. PORTNEY: We'll just keep it between 120 or so of us, yes.

Responses?

DR. OATES: It's interesting. As you point out, it's really not directly related to the framework that's used in these kinds of studies where you've got a well-defined political jurisdiction in which there's a collective outcome.

Here, the jurisdiction itself is subject to redefinition. So I think it's certainly an interesting issue. I don't know how I would draw on the body of literature we're talking about here. I'd have to think more about it.

DR. DEACON: I think it's important to test whether or not communities are in Bowen equilibrium, let's say. If she can come up with a test like that, I think that would be a real contribution. There's only a few of those attempts of that sort that I've seen in the literature.

In some sense, Perry's work with Ted Bergstrom and Dan Reubenfeld; where they get the approximately efficient outcome, suggests that the community is in Bowen equilibrium.

There's also some work done by Randy Bolcomb. He looked at voting data when you have more than one election, and it turns out you can identify what the median was and compare it to the actual. In that case, it worked out. You couldn't reject the hypothesis if they were in Bowen equilibrium.

There really hasn't been much of that done. It's a difficult hypothesis to test. If she can do it, I think that's great.

DR. KEALY: As a research agenda question, I was wondering what you think of the value of perhaps combining stated preference and real preference information in the following way.

Suppose, right after a referendum, you accost a person who just came out of the voting booth and not only asked them how they voted on the referenda, but then try to apply an additional survey that asked how did they vote on alternative scenarios, and maybe get enough information to etch out a demand curve.

Do you see any potential for this idea for obtaining better information on, say, environmental commodities?

DR. PORTNEY: Perry?

DR. SHAPIRO: That seems like actually quite a good idea. These surveys that I've seen on public goods, when they're done close to elections, this is immediately at an election, tend to work out pretty well because people have the issues in mind.

I think that that would be quite a good strategy, conducting the surveys of people who have actually presumably studied some of the issues.

DR. OATES: That sounds interesting too.

A comment that I forgot to make actually is that my treatment of what I call the collective choice method in this paper is a fairly restricted version of a particular model that's been used in the local public goods literature.

There's a larger literature which involves the econometric analysis of referenda outcome, which Perry has been an active part of and which he describes in his comments in his written paper, but really didn't talk too much about today.

So there is a body of work that has looked at referenda outcomes, but not done the kind of thing you're suggesting, Mary Jo, about actually combining the two approaches in that way. I think it's well worth thinking some more about.

DR. KEALY: Probably the hardest sales job would be to politicians.

DR. PORTNEY: You probably wouldn't say that you wanted to accost voters as they came out of the booth. This would lead to a new discipline, accost benefit analysis.

(Laughter.)

DR. PORTNEY: It's about time we stopped anyway.

Dallas?

VOICE: I just wanted to expand the set of possibilities.

It occurred to me, listening to the speakers this morning, of where local and state governments may be making on-budget decisions regarding environmental goods through '92, anyway. I think WRI, I think it's WRI puts out the State of the State Report every year, a survey of what state and local governments are doing in environmental matters.

Through the eighties, they have done this as a very important venue, and some of the issues that they say state governments are playing leadership roles are in having to do with things like local energy standards.

Ross David from Harvard is doing some studies in variations in local energy standards in California. There's quite a bit of variation in the county and city level across California, electric utility and capacity planning that vary a lot by state.

There are now studies going on, various DSM programs, and then there's more local issues, such as lead paint removal, recycling expenditures, and there are state superfund laws where the state, actually several states took the lead, surpassing the federal regs.

So there's a menu of things that one might find, looking for issues at the local level.

The question that I would put back to the group is whether one could think about the attributes that voters or local officials have in mind when they are adopting these kinds of programs, so that one could then extrapolate or be willing to pay for the kinds of things that might be done.

DR. OATES: Thanks, Dallas. That's exactly the sort of thing I was hoping to hear from.

If others have thoughts about particular environmental issues that one might use as a subject for a study of this kind, those are very helpful suggestions. Thank you.

DR. SHAPIRO: This is an excellent idea. It actually has been tried. There is a classic article in this area by Dan McFadden, probably his first on revealed preference of public highway or government bureaucracy. It was the Rand Journal some years ago.

But he tried it with great success and I think it kind of gave a lot of other people some ideas about doing other things.

DR. DEACON: A couple of skeptical comments again.

I think in the things you were talking about, energy standards, lead paint removal, you think about, for example, lead paint removal as something just sort of preventing environmental toxins from getting into the children or something.

It seems to me there are a lot of different jurisdictions, government bodies that are involved in that and not just local ones.

We'd somehow have to, it's not just the responsibility of one jurisdiction. We're going to look at the behavior in one jurisdiction and from that, try to infer preferences for lead paint removal. We're somehow going to have to incorporate what these other jurisdictions are doing in the model to get a sensible outcome.

I don't know if these are going to be simultaneously determined or if you're going to model. The Fed moves first, then the state comes in and the city comes in and does what it likes, so the multiple jurisdiction problem I think is one that would have to be solved, and I don't see any automatic way to solve it just offhand.

Another is that even if you just had a single jurisdiction, maybe it was just the city that was regulating this, the same city agency might be doing a lot of other things. It might be, I don't know, providing sewage treatment for the city or a number of other environmental commodities or services. And if we were going to look at the behavior of that agency, like its spending patterns, and relate that to the costs and so forth that it faces, we have to somehow figure out how to untangle all the different services that this one agency is providing.

If we're trying to get a number for something like, let's say, removal of toxins, those are problems that I can see sort of in using budget data. I don't necessarily see a solution to those right off hand. That's not to say that there isn't one lurking out there somewhere.

DR. PORTNEY: Other questions?

Not everybody at once now.

DR. KEALY: Actually, I want to ask one more question.

Has any work been done, or is there any potential for doing work at the federal level on developing a conceptual or theoretical basis for asking people how they would like to allocate their federal income tax, and using that information to get an insight into whether people actually feel that the allocations are going in roughly the right order?

I just feel that there's a problem potentially with independently trying to get people's valuations for air quality and then trying to get valuations specifically for water quality, and then trying to add these up. It's a typical aggregation problem like we've talked about.

But I don't know of any. And I think Maureen stated in her presentation that she didn't know of anything that was done in quite the detail as the collective choice decisionmaking for local public goods.

Do you see this as an area of potentially fruitful research to try to develop such a theoretical basis for obtaining stated preference information at the federal allocation level of public goods, providing it at the federal level?

DR. PORTNEY Since this is for the record, I should say to the panelists, you have a right to an attorney. If you don't an attorney, there are several in the audience.

(Laughter.)

DR. PORTNEY: Who wants to take that?

DR. SHAPIRO: I'll step in because I'm new at this.

(Laughter.)

DR. SHAPIRO: That actually there's some work going on in that area. There are a couple of Australian economists who are doing this. I've read their proposal and, is it Glenn Withers, is that right? Thursby and Withers. They have one piece, actually what they done is to impose budget balanced conditions on these things so they're making people look at the full menu of the public, because I think that's what you have in mind.

In Australia, if you're looking at public expenditures, it's a pretty well centralized country, so you end up looking at the federal budget. So there is work already going on.

I don't know how successful it is, but it seemed like a good idea. I don't know where they've gone with it, but they're actually doing surveys of this sort. I think that's what you had in mind, is it not?

DR. KEALY: Well, not just doing surveys at this level but trying to find out whether there is a theoretical or conceptual basis for using the information from this, from such surveys, and what would be the interpretation.

I would seem like it would be the same thing as a compensating variation, yet there might be useful information that we could get. I don't know.

DR. CROPPER: Let me just ask a question.

Do you want people to determine how much of their money is going to go into taxes and then how that's going to be allocated? Is that the question?

DR. KEALY: That would be one way of doing it.

You might even do as Richard Carson and Robert Mitchell did for their clean water study. You might even give an indication of how much they are currently spending on a number of things, and then find out if they could reallocate this budget.

I know Richard rejected this notion as a way to get this. But the idea that they might be able to reallocate how they spend the resources to send the signal back about the value that they place on different public goods, not just within the category of environmental quality, but how they might reallocate particular air issues and water issues, but even from environmental qualities to other types of public goods on the national level.

DR. CROPPER: Perhaps someone like Richard should speak to the issue of why this hasn't been done.

I would imagine the reason it's not done generally is that if you want to valuate a specific commodity, you really do want people to make the broader tradeoff between that and all other goods.

I would think that perhaps people in political science or some other area would have perhaps asked these kinds of questions though about how do you divide a given budget among different public expenditure category.

But I can see Richard is going to come to the floor.

DR. PORTNEY: richard, speak briefly to this.

VOICE: There are actually three papers in the Journal of Public Economics. There are ones by Hugh and Strauss, and there's a Belgian paper I think. Essentially, this is an allocation game and if you let people increase or decrease their taxes, you can do some very interesting things. It's a good way to look at marginal tradeoffs. A very interesting paper early on was by Carney and Strand where they actually looked at an agency's budget and got people with a fixed budget to allocate between programs.

The conceptual problem that you really run into is that people don't know what they're getting unless you describe sort of in some detail.

At an abstract level, you get these marginal rates of substitution, and you don't know what sort of the queues are that people think they're getting.

That's why this thing that Ivar did back in the early seventies was more interesting because they actually got fairly low down where it was possible to describe the programs in enough detail. People could see what they were trading off.

At he global level, things are a bit too abstract. You should also know that there are a couple of papers which take the NARC data on National Programs, with more of the same questions like Ferris and public choice. There's also some questions of political science on that.

What you see is that overall national spending patterns, to a really big degree, are responsive to changes in public opinion. The debate there is whether one lags or leads the other.

DR. PORTNEY: Jordan?

VOICE: Let me make a couple of suggestions.

As a naive marketer that knows not a lot about your particular area, but I do have occasion to work in it, one of the things I've done in my life, which I'm not particularly proud of and will never do again, was actually to get a particular political entity -- I won't tell you which one or where -- I built him a model of how people would actually choose to have their taxes reduced.

This model was used extremely successfully by the ruling political party in this particular entity to increase the public taxes.

Once I realized how it was actually going to be used, I vowed to never do this again.

This is not a hard thing to do, it's not very difficult to actually develop stated preference surveys that will actually look at tradeoffs people are willing to make.

Between types of public goods or, for that matter, any other kinds of good, one might think, for example, that a continuum of possible budgets that we'd never get to vote on budgets.

But there's a class of statistical design theory for what are called mixture problems. These typically arise in chemistry. That's the problem with budgets. If you try to study budgets using traditional design criteria, you of course get linear dependency because all of the side conditions add up exactly to one.

These mixture models avoid that and it's quite possible to show a totally different budget outcome, and ask them what their choices would be if they were actually allowed to vote or choose among these various budget options. Then you could actually work out these things quite easily.

So there's quite a large class of problems to which these kinds of problems can apply to.

The problem with this whole literature is that most people look at it extremely narrowly. There's one technique that people in marketing and possibly psychology apply to these things, but if you think more generally about the utility approach, the design of discrete choice experiments, you realize you can go well, well, well beyond the kind of things that you've been doing to estimate large classes of functions.

Whether you can maintain an experiment that satisfies the kinds of conditions in economic theory that you're interested in would be dependent on you who designed that study method.

DR. PORTNEY: Comments or reactions?

I have one if I may be permitted to say so.

It strikes me that one of the problems with doing this in the environmental area is that if you look on budget in environmental protection initiatives, very little of this shows up in the federal budget.

The operating budget of the Environmental Protection Agency is $3 billion, but we spend $130 billion a year to comply with federal environmental regulation.

So in a sense, you'd be asking people not just to allocate the $1.5 trillion that's spent on budget, it would be basically the $6 trillion that's GNP. A lot of that spending shows up in some GNP producing things, and that may be an overwhelmingly difficult cognitive task for people, if I'm thinking about it correctly.

VOICE: I think that's a very good point. We have techniques that come under the heading of what we call "Hierarchical Choice Modeling, or Hierarchical Experiments" that we use to state these at a global level, going down to a particular area.

If you're interested in references to that literature, I can give you that.

One of the other things that is quite interesting in the public arena of course, the elected representatives, and we hire other people that we call bureaucrats who work in agencies. These people are allegedly taking into account public preferences.

I have always been somewhat bemused by the fact that we don't do very many studies to see whether or not any of these people actually reflect public preferences.

One that really piqued my interest was done at the University of Colorado in the early 1970s by Tom Stewart, a person whom some of you know who used to work with NOAA. He's now in the School of Public Policy at SUNY-Albany.

What Tom did was he got the City Council of Boulder to actually go through a number of these budget scenarios, estimated utility functions for each person on the City Council of Boulder, and then estimated utility functions for highly motivated groups like the environmental groups and the Board of Realtors and the Chamber of Commerce, and asked whether or not any of the council members' utility functions coincided in any way with any of these other functions, when the council was specifically asked to take the budget test, as they thought these other groups were.

I think you probably know the answer, don't you? Virtually no relationship.

We frequently apply this in marketing. We like to think that sales reps understand their customers. It's a very interesting exercise of course how to model customers and how to model sales reps, and see whether there's any correspondence. As you might expect, there often is virtually no correspondence.

But unlike politicians, we can actually implement these functions in decision support systems and train the sales reps to understand what the customer wants, so that they can become more effective.

Perhaps we could do this with some of our elected officials or bureaucrats.

(Laughter.)

VOICE: I mean, the technology is certainly there, and we could possibly do that.

DR. PORTNEY: If you don't mind, I would like to sort of break off questions or comments related specifically to this session and move instead to what will be the most challenging but perhaps one of the most important parts of this day and a half conference.

That's to kind of talk about research priorities that we can identify that would provide some guidance to people at the Department of Energy and the Environmental Protection Agency, possibly the other funding agencies that are here.

I'm not very smart. I cheerfully agreed to chair this conference. I never said I would stand up here and wrap up and sort of say what I think I've heard and identify what I think are the important research priorities.

Are you anxious to flee?

(Laughter.)

DR. PORTNEY: I guess over the course of the last day and a half, I've made notes of the things that seem to me to be the most important research questions, but those will not necessarily be yours.

So I guess I would like to start out by raising one, but then I'd like to give you the opportunity to go to the microphones, respond to this, or to say here's what I think are the two or three important things -- I know you'd say that briefly -- that have come out of this.

I guess the first question that has arisen in my mind is the following:

Given that there are people here who are proponents of the contingent valuation technique, or shall I say on the continuum, they're relatively more optimistic about the ability of 0.7 surveys to provide useful information about values for non-use goods or anything else.

And we also have people here who are at the other end of the spectrum in terms of their optimism about the ability of this technique to provide useful information.

Is there a way to get people from slightly different ends of the spectrum together ex ante to jointly design CV surveys that people would agree, in advance, would be likely to provide useful information?

It's something that doesn't happen very often, and everybody in this room knows that there's sort of wasteful duplication of effort because the plaintiff's side and the defendant's side each design their own CV survey. Then they criticize on or another dimension of the survey methodology, etcetera, etcetera.

This is an issue I know Danny Conlan raised. He spoke to it yesterday.

Can we make some progress to try to get some ex ante survey designs so we stop ex post sniping at the survey design methodology evaluation of the results, etcetera.

Danny, and be brief here because we've got a lot to talk about.

DR. CONLAN: I will be brief.

I think that's one possible rule.

I want to make three points very briefly.

One is a possible rule that any research that did an evaluation for which the taxpayer pays should be required to allocate a certain percentage of its budget to advance criticism of the survey.

That would, I think, help convergence quite rapidly by sensitizing, in advance of the kind of criticism that may come, and also by permitting the critics I think not to carp later, and I think that that would be one practical provision.

The second point is just a plea for more collaborative research, and is really addressed more to the people who fund the agencies.

The third point that I'd like to make is slightly more general and has to do with the research agenda itself. As somebody who is not really a member of the community who is not an economist, but comes at it from another angle, I'm really very impressed by the shifting ground of the debate.

That is, the debate is moving at vertiginous speed. It seems to me that one of the things that is happening is that the ground is shifting among proponents of the evaluation to the point that there might be some need for a new examination of the basic theoretical underpinnings of contingent evaluation and its relation to the uses to which it would be put in litigation and in cost benefit analysis.

I'm impressed by the following. When I started out, I thought that here are economists. They believe in theory, and they apply consistency tests to preferences. There is a logic of preferences that these preferences are supposed to adhere to, and when they find that the logic is violated, they will of course give up and change their mind.

What seems to be happening, which I think is very interesting, is that there has been a change. For example, Alan Randall and certainly Hanneman sounded more like a psychologist than many psychologists would sound in his comments yesterday.

There is a shift that has several effects. On the one hand, I think it makes the theory of preferences much more realistic. On the other hand, it has the effect of allowing contingent valuation to escape the test of consistency that one normally would expect it to obey.

Can one do, as Michael was saying yesterday, utilities are what they are. If you do not obey consistency tests and you still have utilities, in a spirit that's quite open-minded, I think that it's time to review where the bidding is, given the amount of shifting that has occurred in the position of the various players.

DR. PORTNEY: Responses or discussion?

Glen?

VOICE: At the risk of not being politically correct, I'd like to say the hell with forced collaboration. I'd like to encourage competition in research in this area.

What I'd like to encourage is simply lots of small grants be given out to a bunch of people and that we look at what gets published in peer review journals.

I share with Rod Cummings my enthusiasm for a couple of years from now and perhaps I share it with Danny as well, that just natural academic progress will push things forward. What we need to do is simply get competition, rather than one, two, or three people getting all the money. Just break it up into small amounts and diversify it.

The idea of a Manhattan project where we all come together, hold hands, and go ohm, and we say we're going to deal with this --

(Laughter.)

VOICE: -- that's not going to work. I'm not picking on what Paul said. I think he was throwing it out for debate. But I really think that's a danger. I know a lot of people are talking about that.

By all means do it, but also allow competition to work.

So the simple message is, don't micro-manage. You blokes in Washington don't know necessarily what the final research is to do. Just let the academics here by competition generate that.

The way to do that is to allow entry, allow small grants. Small grants will go a long way.

VOICE: I think I agree with everything that's been said.

(Laughter.)

VOICE: But I also would like to think that, in a few years, we will get contingent valuation as one of a set of many useful ways of measuring values.

We've seen some of them here. I think it's kind of an accident, an historical accident that I don't quite understand yet about how it obtained the status of the dominant method for measuring non-use values.

So I would like to say, in agreeing with this idea of small grants and lots of research, that we try to let other flowers bloom along the general direction of measuring modalities.

DR. PORTNEY: Ron, surely we can take it as axiomatic that funding should start after all of us in this room have been funded to the maximum extent possible.

VOICE: I'd like to push this line a little bit, to comment very briefly on some operational aspects of all of this.

One thing that comes out to me is the need for us to stop bouncing from one truth to another truth to another truth, to replicated studies designed to really develop and flesh out a point.

Let me given you an example.

Dale Petty and his colleagues not too long ago had this beautiful little paper in JAME. Let me ask you: why haven't there been five or ten replications of that study?

I think the answer is that we really don't have an incentive structure, you know, to provide our colleagues with incentives to do that.

VOICE: You won't publish it.

(Laughter.)

VOICE: Precisely. Why haven't we seen a number of replications? This is just one.

The Whittington study, for example, and the fact is I won't publish it, you know. This is to say then that incentives are such that if you can't get a new wrinkle, you can't say this is wrong and we don't need something else in the world of publish or perish that we live in. You ain't going to get published.

I've been bothered by this for some years and I don't apologize for rejecting your paper.

(Laughter.)

VOICE: The mission of JAME is to publish papers that represent the substantive contributions to the state of the art, and until someone changes that mission, that's what we're going to do.

What I'm arguing for is the number of papers that I reject that I think ought to be published but really don't fit the mission of JAME.

A very good one was Richard Carson's water study. We argued about this a long time ago.

(Laughter.)

DR. PORTNEY: We're moving into dangerous territory.

(Laughter.)

DR. PORTNEY: There are other people that are going to want to talk to you about why you turned down their paper.

VOICE: Let me tell you what I'm in the process of doing, and I'm going to ask you all to so something for me.

I'm in the process, I've got some editors and I'm putting together a proposal to the area board that I intend to begin a new journal that has, as its mission, simply empirical studies with an allowed welcome to replications because my feeling is that if we don't provide incentives to get research that is focused on replication, good, solid, empirical work that encourages replication, we aren't going to make the movement in this area that we need to be making.

So I'm going to ask all of you to do something. Now this is going to be something like a referendum on CVN and response rate is very important.

Okay, we know there's about 80 of you here and I ask you, would you write me a letter, 1) telling me what do you think of the idea of a classing, empirical journal that welcomes replications? There's your willingness to pay question. Would you in fact pay that $50 submission fee or whatever it is, and if you're in an academic institution, would you comment what do you think is the probability that your library will pick it up, because the institution memberships are very important.

Please don't call me and leave a message on my recorder like, Ron, you're spending too much time in the sun, or, yes, we think it's a beautiful idea. That won't help me.

I'm at a point where I would really like to hear back from the people that are being affected. Would you pay and would your institution pick it up?

So please, pretend that we've got a provision rule here that says, I need a high response rate.

Yes?

DR. KEALY: Is this an easy way for you to get data for your next paper?

(Laughter.)

VOICE: Ron, we need your address.

VOICE: Look at your copy of JAME. Please tell me you subscribe to it.

(Laughter.)

VOICE: We do ask the Secretary to send Professor Louvier an application.

(Laughter.)

DR. PORTNEY: Ron will be available at 12:00 o'clock to discuss papers that he's turned down.

(Laughter.)

DR. PORTNEY: Just get behind me in line.

Other questions or comments?

VOICE: It seems dangerous to follow the editor of the journal you work for. Being associate editor means you always get the worst papers that come down the pike. Maybe you disagree.

I guess I have a couple of reactions to things I've heard here over the past day and a half. And it seems to me that Paul made an observation that he hasn't repeated.

I'd like to pick up on that.

As we ended our session yesterday, he said gee whiz, many of the things that I just heard in the last hour and a half really are testable hypotheses.

It seems like people have not really picked up on that from what I've heard so what I'd like to really do is to see if we can't take a couple of minutes here and think about which of some of the things that have been discussed are indeed testable hypotheses, and which of those hypotheses might actually be more worthwhile than some of the others.

I started going down on my list of things that struck me. It seemed to me that one of the areas in which testable hypotheses are going to be very important to us relates to what kinds of theoretical conditions would we really think ought to be imposed or should be upheld as we're going through trying to measure people's utilities here.

I think papers have talked about these in terms of adding up conditions.

Certainly one thought that occurs to me from a research design point of view would be, are these conditions satisfied for goods that are dealing with marginal use values and are they satisfied as you move towards the things that have more non-use values.

A systematic attempt to try to vary the spectrum of the good to look at the same kinds of conditions I think might yield us some insights in terms of when these things hold and when they don't hold.

The second issue I think I'm going to actually appeal back to somebody else who's not here, but whom I've had the good fortune to work with for many years, and that's a question that Kerry asked a long time ago in response to a paper that Michael wrote, which is what we really need here is a better understanding, and I think I heard this from Jonathan Barron and a couple of other people as well, a better understanding of how people answer the CV questions.

I find that we've talked around that issue quite a bit without really getting at it. I think that some of the things that Barbara Kennedy's been doing helped to move us toward this issue of how are people really responding here. Can we set up research that would help us to understand how we would respond to CV questions.

I think that a lot of this debate about question format, which I guess I've been somewhat of a player in, I think really stems from our lack of understanding as to how people really respond to different question formats.

In formulating their answers to these questions, I think the attempts to understand protest movements are really part of this same phenomenon. To me, it seems like there could be some useful opportunities here to really set aside some attempts to look at that kind of thing.

The last area is one that has been talked about, or somewhat referred to. That's the work that some people are starting to do, I guess Richard in particular, in meta-analysis. I think there's a lot of benefit that can be drawn from meta-analysis type studies.

Recently, I've had some luck with some of the things we've been doing using that technique. One of the things that I've found frustrating, though, is if you're going to do that analysis, you need.to have information that's frequently not available in the articles that are published, Ron.

In terms of the reporting of the functions, the bid structures, and the other kinds of information. If you're going to try to explain relationships, you need to know what the characteristics of different studies are.

And I think it's very incumbent upon us who are editors or associate editors or whatever to really try to push towards better reporting so that someone can actually try to do a meta-analysis. I actually tried to do one before this conference and I couldn't do it. There wasn't enough data in the 37 published studies that we had on line.

Thanks.

DR. PORTNEY: Responses?

Peter Diamond?

DR. DIAMOND: I want to pursue an indication of Bill's suggestion of looking at the bases behind the answers to the questions.

It seems to me there's content in the answers. The question is, what is the content. And that links, it seems to me, to how the answers get used.

What I want to do is touch back. on a broader book that I referred to earlier, just to throw out a hypothetical. Anywhere there is a collective decision problem, whether it's a family or a country, we know there are no ideal processes for producing answers, but we also know there are some processes we like better than other processes, or at least some people like better than other processes.

There are again always disagreements. If there weren't disagreements, there wouldn't be a collective choice conference to begin with. So if we think about the mechanism of decisionmaking in the environmental area and look at some of the parallels -- I'm, as you know, quite new at the CV but I'm an old hand at public finance and I see a lot of parallels and questions.

Just as a quick aside, picking a single calibration number, which obviously is hopelessly inadequate, seems to me a lot like the question of picking a single discount rate for the government, which any second best analysis will tell you the right way to do it isn't by just picking a single interest rate.

But it remains a legitimate third-best question, what's the best interest rate if you're not going to do all the other things? It seems to me calibration is a similar question.

The government recognizes, and society recognizes lots of different ways of structuring decisions, and they come out differently. I live in Lexington. Lexington has an elective town meeting. I'm a town meeting representative. The process of decisionmaking that goes on is clearly very different from what goes on with things that get put to referenda.

Concord, nearby, has an old-fashioned town meeting. Any citizen can show up. It would be lovely to have somebody study what are the differences in the outcomes relating to the structure.

Congress recognized base-closing is something they had a lot of trouble with, so the Base Closing Commission mechanism is in place to deal with that.

The role of benefit cost analyses, generally in government policy, is a piece of the decision nexus, and in terms of thinking about how you use what one learns, recognizing that there'll be arguments about what one has learned from any study, but how you use it, it seems to me, has to be fitted into a mechanism design question for the government decision.

I don't mean that in the sense of a mechanism design literature, a particular solution to a particular observation, but just in general we are designing a mechanism to produce public decisions.

So let me throw out a hypothetical, just to then ask, well, what kind of mechanisms might we want to use for this.

The hypothetical I thought I wanted to really isolate on non-use values is wilderness. Congress decides to set aside some wilderness area that's really going to be untouched by people. People are not allowed in. Nobody can use it in any form whatsoever. And Congress appropriates some number of billions of dollars to buy and set aside an area, and Congress asks DOI to pick the area.

And they go out and they do a whole bunch of surveys and they say, hey, there's one place in the southwest that would be a great wilderness area. It has this kind of climate, this kind of ecology, these animals in it. And then they do another survey, spot another area in the northwest very different, but it's also a candidate. They've got enough money to pick one. They cost the same.

What it seems to me to be a very hard problem. You want to protect this ecology or that ecology. Do you want the wilderness here, or do you want the wilderness there?

What kind of mechanism would you want to have for solving that?

Where would CV fit in?

The NOAA panel thought comparison CVs would be a better source of information than absolute level CVs.

I think, as a question, what kind of mechanism, what would be the role of Congress, of civil servants, of opinion polls of the general kind, specialized kind of opinion poll? How would we want to design that?

That it seems to me is a question that one shouldn't just answer off the top of our heads. There really ought to be serious thought and analysis. If you use this kind of mechanism, here's what you might learn.

I think that's a researchable question.

DR. PORTNEY: We would welcome that.

Go right ahead.

DR. BERGSTROM: It's not really in response to that comment, but maybe somebody would follow up.

I just want to have the opportunity to say something I guess from the rank and file.

John Bergstrom, University of Georgia.

I spent a lot of time researching in a teaching program working with agencies, organizations, trying to apply some of these numbers. If we look at policies and decisions, there's a couple of parts to the research agenda which I guess I'd like to highlight.

One is the difference between use and non-use values. A lot of the issues I have worked with, the agencies are more concerned with the use values, so it doesn't seem there is the use of CVM or other techniques a big concern under the use values; for example, looking at reservoir use.

Are most of the important controversial issues really non-use? I'd like to see those issues separated as we go forth in the research agenda to make sure, when we make statements like you shouldn't use opening questions or different techniques, we have documentation on these values.

I guess, in working with the Forest Service as well, they have given us guidelines on what project to use the best available approach that we can use, given the data and the budget constraints and the time constraints that we have.

So I'd like to see the research agenda remain flexible and open and not see us make hard and fast rules -- for example, you can never use mail surveys or certain techniques -- when those may be appropriate for certain applications.

DR. PORTNEY: John, thank you.

Comments?

Bill Scholtze?

DR. SCHOLTZE: I really want to follow up on that. My first comment is really a similar plea, both to

DOI and to NOAA. That is don't make the regulations as restrictive as they now read.

The reason for that is these regs will not just be applied to court cases. That's what everybody originally assumed. That is in EPA, when the Forest Service does a CV study for any kind of policy analysis, they are going to be forced to follow those regulations. That's a simple fact, okay. Just take my word on that.

And this will effectively choke off the major funding sources for doing research. That's just the way it is. So those regs have to be written more flexibly or we will be stuck with those procedures forever.

My second point is that I really don't know of a source of basic research funding for this application. I really don't know the source.

All of the money I have ever gotten has been to provide a value for specific policy problems. I've never received basic research money, so I would hope that we would go to NSF and say, look, you really need to devote a substantial amount of money, and to provide that money to a wide variety of investigators, because I totally agree with the notion that what we need are new ideas and the same people are finding the same methods over and over again. And that approach is not going to solve the problem.

I think one example of that is in market research. That's a very exciting approach. As I read the protocol, that approach would be excluded.

Anyway, that's all I've got to say.

DR. PORTNEY: Other comments or reactions? Richard?

DR. CARLSON: Just given the general nature of the papers at the conference, we could have had an entirely different sort of notion which focused on, say, statistical issues involved in analyzing discrete choice responses, had a whole session on mail surveys versus telephone surveys versus in-person surveys, a whole session on why people think you get different values with different solicitation methods. And a lot of these issues were sort of brought up around the fringes of the papers that were given here.

In thinking of a research agenda, those were actually a lot of the practical questions that people deal with over and over again, having to actually do contingent valuation surveys.

And these sort of little picture questions shouldn't get lost in a discussion of the big picture.

DR. PORTNEY: Richard, I couldn't agree with you more, and if I had the time to go down my list, next on the list was studies testing whether in person produces different results from mail surveys, whether open-ended versus -- these are eminently researchable questions.

We could do split sample experiments like this tomorrow, starting tomorrow, if the will was there and the resources were there.

I want to second that, as a participant, not necessarily as a moderator.

Howard?

VOICE: Just a notion of not forgetting the small picture I guess brings in sort of not forgetting the even bigger picture than the one we looked at.

We started out with pretty general discussions of utility * and altruism, but we got pretty quickly focused down, I think, given the nature of current events, on non-use values or environmental goods or environmental public goods.

I think in the general discussion we have altruism. As I understood, as long as it's something other than a utility function of one person entering into a utility function of another person that there was potentially a role for altruism.

And I guess the issue is do we need to look at non-use values in a more general way, or only at environmental public goods.

DR. CARLSON: I was actually not being critical.

VOICE: I know you weren't being critical. Your notion of centering down, you know, we operate at some level. I guess there certainly are the issues, in further response to you and your thinking on that, we should have dealt with perhaps in a more detailed level.

But there are some other issues that almost, after we got past the very first session, we sort of got past them very quickly.

DR. CARLSON: As a more concrete sort of thing, you could actually sponsor sort of a conference on nuts and bolts issues, and have some real fights.

(Laughter.)

DR. PORTNEY: And at perhaps the most concrete level, time is up. There will be a buffet lunch that should be set up right now outside.

I have one concluding remark to make.

That is that I've had the privilege of standing up here looking out over the audience for the last day and a half. What I've seen is world class researchers in economics, experimental and cognitive psychology, sociology and survey research, marketing as well as very high ranking policy officials responsible for making policy decisions and allocating research budgets at the Department of Energy, the Environmental Protection Agency, the Department of the Interior, the Department of Commerce through NOAA, Office of Management and Budget, and the Council of Economic Advisors.

That's really a unique thing, and I think it attests to the importance of this subject to the potential of research on. not only contingent valuation, but such things as conjoint analysis, multi-attribute utility theory, and all of the other things that we've talked about today.

My hope is that the next time that a group of people like this gets together, we will begin to appreciate or share the hope that I have now, and it's a belief, I guess, that five or ten years from now, we will have made enough progress in this area out of an original interest in putting values on or attaching dollar values to lost non-use values or passive use values.

I think we have the potential to make so much progress in this area that we will edify the entire economics profession and change the way it and perhaps the other social sciences approach the whole issue of valuation.

I really think the potential is there, and I hope we can continue to meet in the constructive way that we have in the last day and a half.

My thanks to the Department of Energy and to EPA for cosponsoring this. Go eat lunch and enjoy the rest of your day.

(Applause.)

(Whereupon, at 12:00 p.m., Friday, May 20, 1994, the meeting was concluded.)