

Econ 4545 Second Midterm: Fall 2015

Second part: essay

This half of the exam will count for 40% of the exam grade, 20% for each question.

1. For simplicity imagine that temperature varies by time of day and season but not by location. So, for example, at ten in the morning on November 10th 2015 it is same temperature everywhere in the Northern Hemisphere.

You, being the great environmental economist that you are, have been hired by the Federal government to estimate the net WTP on the part of the American people to reduce global warming by three different amounts.

In broad strokes, propose how you would do the estimation. As part of your answer note methods that you rejected, explaining why you rejected them.

I told you I might ask this question?

Thoughts: First think about the effect of GW. Generally speaking, in this world with no temperature variation across locations at a point in time, all will experience the same reduction in the rate of GW.¹ Temperature is the same everywhere but lower than it would have been without the reduction.

Sea level will rise under every scenario but how much flooding this causes will vary by location because the steepness of coast lines varies. For example, the Northeast of U.S. will flood much more than the Northwest of the U.S, and some islands in the Pacific will likely disappear. So there will be location specific effects, having to do with how far you live from a coast and the nature of that coastline.

This suggests, at least to me, that some of the effects of GW will be capitalized into land prices. Given that temperature does not vary across locations, it would seem that the effects of GW will not be capitalized into wage rates.

So, one might capture some of the use damages with a hedonic property value study, but only after a new equilibrium was reached. This would take years, and, besides, the equilibrium would keep changing as the temperature kept rising.

In addition, a hedonic property value study would not pick any of the non-use damages, which are likely substantial (e.g. individuals caring about the injuries that others are suffering.)

¹ In the real world things are much more complicated. Not everywhere is the same temperature, so even if temperature were to rise by the same absolute amount everyone, there will be differential effects that vary by location. Seattle, Canada, and the Nordic countries will, relatively speaking, become more livable, and it will become impossible to live some places that are now very hot (e.g. places like Saudi Arabia). I have assumed these complications away.

How about a travel-cost model. One cannot travel farther to get lower temperatures, so where people travel, and how far, tells us nothing about how they value the temperature or a change in the temperature.

So, I am inclined towards a stated-preference technique in part because a lot of the damages will be non-use value, but also because I suspect land markets are not in equilibrium wrt GW. And, in large parts of the world the market for land is not competitive, and moving is not always an option from it comes to moving to a different country. That is, a hedonic property study would probably underestimate use-values.

I suspect that many of you will recommend a referendum CVM study or multiple referendum CVM studies but I am going with choice experiments.

To estimate damages for three different levels of GW reduction using referendum CVM one would have to do three separate CVM studies, one for each level of reduction wrt to the status quo. For each percentage reduction you have to ask different people different \$ amounts.

But, I am going with choice experiments because it is more flexible and more informative.

I would create a large number of possible alternatives, each would involve some rate of global warming and a cost (some yearly increase in taxes). One of these alternatives would be the status-quo rate of increase in GW with no increase in taxes.

Each individual respondent (there would need to be many) would then answer one or more choice questions (maybe three to five). Each choice question would have two to three alternatives to choose from. In some of the choice questions one of the alternatives would be the status-quo. The choice questions would be designed so that for each of the three levels of reduction in GW, a full-spectrum of tax increases would be covered. And for every level of tax increase the choice questions would span the full spectrum of GW reductions.

This is what was going on in the example choice experiments that I showed you. See also the answer in the review questions explaining choice experiments

More detail than required: As I eluded to in my presentation about choice experiments, the CV for different levels of GW reduction would be estimated using the collected data.

Specifically, one estimates the probability that one chooses each alternative in each choice question as a function of its cost and rate of GW, and as a function of the tax costs and rates of GW in the other alternatives in that choice question.

The advantage of this technique over three different referendum CVM surveys is one is collecting more data from each individual, and, in theory one can estimate WTP for more than the three rates of decrease.

All that said, an aside:

A problem for any choice question, including a referendum CVM is that people might find the scenarios unbelievable, might assume the stated goal cannot be achieved, might believe the stated goal cannot be financially achieved if everyone faces the tax increase in the alternative they chose, or feel it is unfair for them or others to pay the specified amount.

Or they think the government will either spent the collected taxes on something else, or that the government is not capable of reducing the rate of GW.

Keep in mind that many people view GW as some liberal conspiracy, as my brother does who happens to have three graduate degrees.

Think about how you might answer the choice questions if you did not believe there was GW.

Think about how you might answer the choice questions if you believed in GW but did not think it possible to affect its rate. E.g. you believe GW has nothing to do with man or you believe that it is too late to do anything about it.

Think about how you might answer if you believe GW is real and caused, at least in part, by man emitting CO₂ into the atmosphere, but think the government incapable of effective action.

These are all reason why you might get from choice questions biased estimates of what people would pay to reduce the rate of GW

Note that before the GW choice question are asked, the respondent is typically presented a lot, but not too much, information about GW, its cause, and how much different policies would decrease the rate of GW. This is all necessary and good but people start the survey with beliefs about how the world works and it is difficult to change peoples' beliefs not matter what you tell them.

Some comments on some of the answers:

Did your answer include a discussion of how you would do it for three different levels of reductions?

Saying you would "ask some questions" does not cut it.

Did you discuss the techniques you did not use, and explain why you did not choose them?

If you recommended a referendum CVM format, did you provide enough information so that your reader knows what that is? Did you give your reader a sense of the specific question or questions you would ask?

Some of you talked about different costs and levels of reductions but unless the reader already know what referendum CVM was, they would not have a good idea as to what you would do.

Some of you said we have to determine how much people value the future, or make some assumption about how people value the future. This statement is misguided. How much you are WTP to reduce GW by different amount will influence how you answer the choice questions. For example, an individual who puts no value on the future would also choose the option with the lowest cost to them.

Some people suggested payment card CVM because they claimed there is less potential for bias than with referendum CVM. I have no idea why you would say that. If one is going to do CVM, referendum is considered to best method.

All CVM questions and all choice questions are hypothetical questions unless the result is binding on the individual. Do you know what “hypothetical” means? Can you give me an example of a choice question that is not hypothetical?

CV and EV are different dollar measures of value for a state change. They are not methods to estimate value.

The question, “Would you pay \$X to reduce global warming? Is a meaningless question. Reduce by how much?”

2. Assume that everyone lives alone and that a small proportion of the population is deaf. Except for being deaf, deaf people are just like everyone else in terms of skills, educations, etc. Discuss the geographical distribution of deaf people. For example, would you expect deaf people to be equally represented in all locations? Explain your answer.

This was discussed in class for a bit a day or two before the exam. I was mostly thinking about noise, and along the following lines.

What makes deaf people different: they cannot hear noises—good noises, bad noises, and people speaking. So, *ceteris paribus*, they can get a consumer's surplus bump by living places with bad noise is capitalized into lower rents or higher wages.² E.g. close to airports.

A few of you said that deaf people would prefer to live in noisy places. That is not quite right. They are indifferent to noise, so they don't care whether it is noisy or quiet. They would be attracted to a noisy places only because the rent is cheaper. In you answer it was critical to mention rents.

Avalon pointed out that that people who cannot hear might be more attracted to pretty places than the hearing. Also the deaf would not get a benefit from living near the concert halls or opera venues.³

An aside: Studies show that people can get used to noises that are constant (e.g. constant traffic noise) or predictable (church bells, etc.) but it is difficult to get used to unpredictable noises.

An aside: deaf people can also get a consumer's surplus bump by working in highly noisy jobs—they would not suffer as much as the rest of us would. I might suspect that jobs with constant noise. Working on railroad track where it is important to hear the train coming might not be ideal.

Zhanzhan pointed out that it is easier for deaf people to communicate with each other than with the non-deaf because most of the deaf know sign language and most of the hearing do not. This suggests that, *ceteris paribus*, they would be inclined to live near each other. But, as one student pointed out, the question says that deaf people are like everyone else in terms of skills, and this could be interpreted to mean that they people who hear are just as likely to know the skill of sign language.

As aside: think about blind people. Are there places where one might live or work where it is an advantage to not be able to see, or not a disadvantage.

² The same is true but to a lesser extent for people with limited hearing who wear hearing aids—you can turn them off.

³ That said, they can feel the vibrations from heavy base.

