

## ASSESSING THE SOCIAL IMPACT OF THE ETS

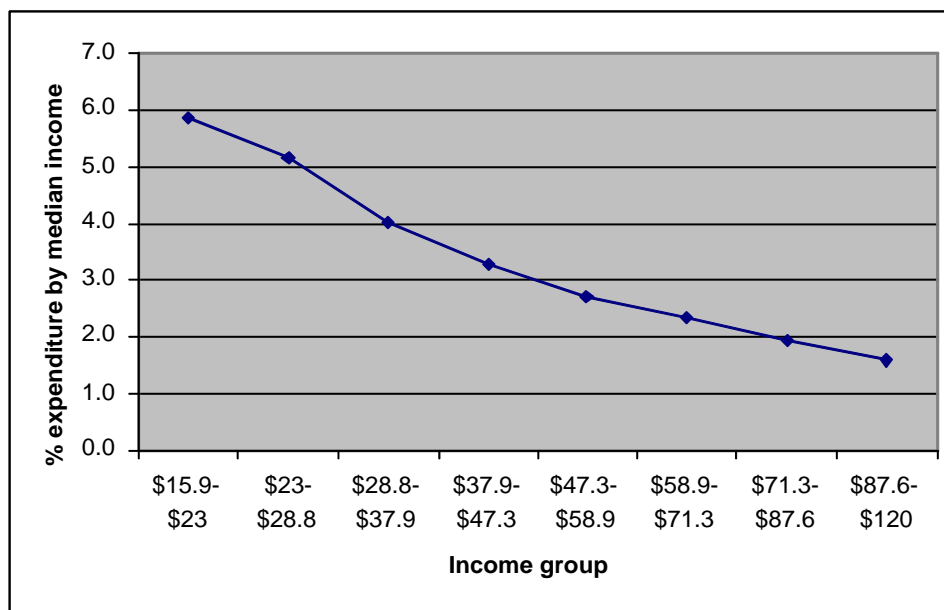
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Thankyou for the invitation to talk today. It is a pleasure to be working again with Computable General Equilibrium Models. In the early 1980s New Zealand was a world leader in CGE modelling. Unfortunately when they were applied to the policies of the late 1980s, they did not give the answers that the policymakers wanted. It turned out that the CGE predictions were far more accurate than the promises of those who implemented the reforms, so CGE modelling made two unforgivable mistakes: it criticised the policy makers and it got it right. Accordingly CGE Models were punished by having investment in them cut back. So nowadays we have to scramble around with underdeveloped tools when they are needed.

That they are needed is evident if you look at this diagram, which pops up in various official papers. On the vertical axis is the outlay of houses on home heating as a proportion of total outlay; on the horizontal axis is household incomes.



The graph seems to be correct but it is misleading, insofar as it implies that the poor are relatively big energy users. They are not, of course. We are not going to solve the world's energy problems by blaming the poor and becoming rich. The mistake arises because the graph shows only direct energy consumption, and not direct and indirect – exactly the sort of issue which CGE models are designed to clarify. Until there is evidence to the contrary, we

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have to assume the commonsense position, that the higher the incomes the higher total (direct and indirect) energy use, that the income elasticity for energy is above unity.

Of course a CGE model requires some challenges of interpretation. Here I confine myself to making a few salient points on Adolf Stroomborgen's various applications to the Emission Trading Scheme (ETS).

### **Contextual Assumptions**

The first is that it is worth reflecting on 'the business as usual' scenario which underpins the comparison. It involves variety of assumptions including about:

- The current international financial crash, which may be the greatest since the 1930s depression;

- Peak oil, or at least the rising price of oil;

- The impact of the internet on the location of jobs and services;

- The relative balance between food and manufacturing prices (the terms of trade);

- The international trading environment including the Doha round and its successors, and the rising numbers of increasingly complex Free Trade Agreements;

- The rising economic importance of East and South Asia;

- Major new technologies in biotechnology, ICT and new materials;

- Other major changes in government policy.

Now Adolf, whose modelling we are looking at today, will say – quite correctly – that with the exception of new technologies affecting carbon emissions, these assumptions do not invalidate the model conclusions, because they impact much the same on both the 'business as usual' and ETS imposed scenarios.

However, it is worth listing these assumptions because any one of them may have as great an impact as the ETS. Thus while there are specific issues associated with carbon emissions, the policies about social impact need to address all the possibilities of structural shock.

There is one further assumption in the business as usual scenario I need to point out. It ignores the fact that the rest of the world is also taking measures to slow down the rate of global warming. Much of the public debate surrounding Adolf's forecasts has not understood this, nor the policy issue of what is the appropriate international strategy for New Zealand if the rest of the world takes global warming seriously.

If the rest of the world takes measures to inhibit carbon emissions, that may be of immediate economic benefit to New Zealand, as well as the long term and climate gains. Thus the modelling describes the downside to New Zealand of our dealing with carbon emissions, but

it does not investigate whether there is an upside from the responses of the rest of the world.

## **The Impact of the ETS**

How big is that impact of the ETS? According to Scenario 10 of Adolf's modelling runs, under some assumptions which I shall deal with shortly, there would be a loss of about 52,000 jobs (or 2.6% of workforce). Strictly the model says they will be lost over the 19 years from 2006 to 2025, say about 2800 jobs a year, which is not a major challenge. However Adolf suggests that because the ETS regime is introduced over a short period, the job displacement will be relatively quick. I consider that a reasonable interpretation of the model.

Do the 52,000 jobs represent a big loss? Well of course they do, but in less than five years beginning in October 1988, 754,000 New Zealanders enrolled with the New Zealand Employment Service. Additionally, there were others who chose not to use the NZES. By comparison, 52,000, which includes everyone who has to look for a job, is much less – less than 7% of that total. So we are not talking about a structural change as great as occurred in the late 1980s and early 1990s.

Moreover, there is a sense that the 52,000 is an overestimate, although there are all sorts of caveats. The model scenario does not include the likely technological changes which the ETS will induce – but we have to make sure they happen – while the model assumes there is no flexibility in the prices system. You can see this in the way various sectors respond to the assumed ETS in Scenario 10:

Employment: The vast majority of sectors cluster around the average job loss of 2.6%. For instance, four fifths of the lost jobs are in sectors which are in the range from 1.6% to 3.6%. The main exceptions are farming and energy industries which experience high reductions, and the public sector with lower losses.

Regions The regions are even more clustered. With the exception of Waimate (Hurunui and Southland are on the upper edge), they are all in a 2.1% to 3.6% range. The pain is spread nationally. (However, the detail is not fine enough to allow for a factory closing down in a particular region.)

Occupations The biggest impact is on job losses for production workers, with the semi-skilled more affected than the skilled or unskilled, although there are particularities of experiences for each occupation (so that energy and farm workers are affected more). Production workers amount to 30 percent of the total labour force and lose 39 percent of the jobs.

What is happening in Scenario 10 is basically an economic contraction with some of the

major carbon emitters – farming and energy – contracting at a higher rate.

But Scenario 10 assumes that factor prices are fixed, so that wage rates, among other things, don't change.

### **An Alternative Response Assumption**

This is a fixed-price assumption. Suppose we allow wages (and some other factor prices) to vary, responding to market conditions. That is the Scenario 5 assumptions. Their effect is that there is no change in total employment. The sectoral compositions are as follows:

Employment: The vast majority of sectors now cluster around the average of 0.0%, so there is little change. Again the main exceptions are farming and energy industries which experience reductions of over 1 percent, but the totality of jobs lost among them is around 2500.

Regions As before the regions are even more clustered. No region suffers more than a .4% drop in employment.

Occupations There is no tabulation of occupational outcomes under Scenario 5.

What I have done here is compare the rigidity of Scenario 10 to the flexibility of Scenario 5. In summary, if factor prices are flexible, then there is not a lot of change in the structure of industry or employment or regions except where we might expect it. Unlike the fix-price model which primarily predicts a contraction, the flex-price model sees the issue is more of reallocation and price adjustment.

### **Conclusions**

CGE experts like Adolf can go on making their models jump through various hoops. My time is short, so as much as I would like to as well, I had better bring together what we learned. I begin with that I am cautious about the precise quantities these models predict. Their strength is they provide analytic insights.

Second, I repeat the two weaknesses of the modelling. One was that it does not look at what the rest of the world does. It is not impossible that if the rest of the world takes its Kyoto obligations as seriously as New Zealand we may be better off than the predictions. The other weakness is that it does not incorporate technological change induced by the policy changes. It could. I am sure Adolf would love to run such a simulation. It should make possible a measure of the gains from investing in low carbon emission livestock technologies.

Third, having cleared the preliminaries aside, I can say something about the social impact of an ETS.

A particular concern is the distributional impacts, but we have only very limited insight into the effect of the ETS. Some of the hardest hit would appear to be in lower paid occupations, but it seems likely that since higher incomes are likely to consume relatively more energy in total, the combination of pay and prices cannot be inferred. (In any case, there are implicit income tax changes in the simulations.)

Insofar as I have a conclusion it is limited, but policy-useful. The more flexible the economy, the better it is able to cope with a shock such as the ETS. That conclusion applies for all the other shocks I listed at the beginning. Even were there no ETS the economic policy conclusion would be to go for flexibility.

But that leads to what is the main conclusion from this survey. A flexible economy impacts upon society. People prefer stability and they want some security. There is a tension between a flexible economic policy and the desired social policy. It is the same tension as we have faced over the last two decades.

But we don't know nearly as much about the complexities of societies as we do of economies. In principle CGE modelling has the capacity to monitor some of the social impacts of economic change – on the household income distribution, on the government's fiscal position, on occupations, on the intricacies of the labour market. But in New Zealand we do not have the practical capacity.

That is the consequence of the cutback of investment in CGE models from the mid-1980s – dropping us from the top half of the OECD into to the bottom half. If we are serious about monitoring the impact of economic change on society – if we really care – we are going to have to recommence that investment program.