Analytical General Equilibrium Effects of Energy Policy on Output and Factor Prices

Don Fullerton and Garth Heutel

Discussant:

Samuel Kortum

Overview

- Important Question: What are distributional effects of policies to control CO_2 emissions?

- Policies change relative prices of goods and relative returns to factors:

  1. Groups choose different mixes of consumption.

  2. Groups own different mixes of factors.

- Link from policy to goods and factor prices: calibrated GE model.

- Link from prices to distributional effects: 2008 Consumer Expenditure Survey (CEX).

Value of Simplified Models

- Issues of climate change have brought CGE models back into the mainstream.
- CGE models are too complicated to totally understand.
- Want the simplest model that can make sense of CGE results.
- This paper: hybrid of CGE and simple model.
- Model is both too simple and too complicated.

- A “Lerner Diagram” from international trade is a simple way to see the basic forces.

Closed Form Solutions

- Is it really a closed-form solution?
- Actually the solution to a linearized system.
- Valid only for small changes in policy, i.e. change in carbon tax.
- Maybe that's fine for the question at hand, I don't know.
- In contrast, CGE models typically solved exactly, albeit numerically.

An Inconsistency

- Part I of paper uses a GE model with a representative consumer.
- Part II feeds the results into an analysis in which preferences differ by income group.
- There's an inconsistency.
- Not a problem with studying the income effects from changes in factor prices.
- But, typically can't represent heterogenous preferences with a representative consumer.

Results

- Part I: changes in goods and factor prices due to doubling carbon tax, from GE model:

- .... relative price of dirty good rises 7%, wage rises 0.04%, capital rental falls 0.07%.

- Part II: differences in spending and sources of income from CEX:

- ... poor spend over 13% on dirty good, rich about 8%.

- ... poor get more income from transfers (but nuanced about wages vs. returns on capital).

- Sensible bottom line: little distributional action on income side and modest (1/2 percent on spending)

Conclusions

- Important to confront these distributional issues.
- We too often ignore them in economics.
- The income cut generates less action than I expected for burden of a carbon tax.
- Are there other cuts where heterogeneity in the costs would be more striking?