Adaptation of American Homes to Climate Change

some comments

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General comments

- Nice and ambitious empirical paper

- Relevant and timely question: impact of climate change on investment in house equipment and energy consumption; cost for households of adapting to climate change

- Large panel data set of US homes combined with weather data

- Econometrically-challenging: two linked decisions (investment, energy use), panel data, endogeneity issues, dynamics (capital stock, investment)

- Heavy empirical modelling involving several sequential steps and a number of assumptions

Specific comments – model specification

Link between the two main models (investment and energy use) should be more explicit:

Investment equation: $I_t = f(Z, K_{t-1}, X \text{ etc.})$

Energy use equation: $q_t = g(q_{t-1}, p, K_t, Z \text{ etc.})$

Do you assume $K_t = K_{t-1} + \hat{I}_{iht}$ where $\hat{I}_{iht}$ is obtained from first stage?

Specific comments – econometrics

- Multiple stages: control function approach to deal with the endogeneity of the stock of capital in first-stage model & investment predicted in first-stage model used as a regressor in the second stage

- Raises concern about the accuracy of the standard errors at the final stage

- Serial correlation in the error terms is also likely

- Some instruments would need greater justification: e.g. refurbishment of the kitchen or bathroom as instrument for past energy use (also, small variation over time is expected)

- Estimation of energy consumption made separately for hh using gas and hh using electricity – could selection bias be an issue?

Specific comments – adaptation cost to a 1°F increase in temperature

- Pretty small estimated impact on energy consumption and GHG emissions. Standard errors should be calculated and reported.

- Is the total monetary impact (+$95 and +$153) statistically different from zero?

- Sensitivity analysis around the prices of gas and electricity would be useful

Suggestions

- Report how incorrect the estimated energy consumption would be if first-stage (investment behaviour) was omitted

- Can your findings be contrasted with those of Deschênes and Greenstone (2011) and Auffhammer and Aroonruengsawat (2011)?