ECON7103 HW3

Sedat Ors

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1 Stata

1.

- a) Let's take the log of both sides $y_i = e^{\alpha}\delta^{d_i}z_i^{\gamma}e^{\eta_i}$

  $lny_i = \alpha lne + d_i ln\delta + \gamma z_i + \eta_i lne$ where lne = 1
  So $lny_i = \alpha + d_i ln\delta + \gamma z_i + \eta_i$

- b) δ menans percentage change. if we increase δ 1 percent y_i changes 1 percent. But if we need to interpret for the retrofit program, it shows the effectiveness of treatment program. if d_i =1 it means everybody treated in the group, if not δ =0.

- c) when we take derivative of equation above according to the d_i,
  $\frac{1}{y_i}\frac{\Delta y_i}{\Delta d_i} = ln\delta$
  $\frac{\Delta y_i}{\Delta d_i} = ln\delta y_i$

  Note: I can not understand that whether δ is a function of d_i or not. I assume δ not dependant variable of d_i.The average marginal effect (AME) is a measure of the average change in the outcome of a dependent variable (y) resulting from a change in the independent variable (x), holding all other variables constant. The AME represents the average treatment effect of the change in x on y for a given sample or population. It provides insight into the overall relationship between x and y, and can help to identify the most important predictors of the outcome. So, if we change d_i 1 unit, y_i change $ln\delta$

- d) Let's take the derivative of the equation above,

  $\frac{1}{y_i}\frac{\Delta y_i}{\Delta z_i} = \gamma\frac{1}{z_i}$
  $\frac{\Delta y_i}{\Delta d_i} = \gamma\frac{y_i}{z_i}$
  when if change z_i 1 unit, y_i change $\gamma\frac{1}{z_i}$

	Coefficient b/ci95	Marginal E~s b/ci95
lnsqft	0.89***	0.89***
	0.88,0.91	0.88,0.91
lntemp	0.28*	0.28*
	0.05,0.52	0.04,0.52
retrofit	-0.10***	-0.10***
	-0.11,-0.09	-0.11,-0.09
Constant	-0.77	-0.77
	-1.81,0.27	-1.83,0.30
Observations	1000	1000

Figure 1: Electricity usage

- e) See Figure 1 - table 1
- f) See Figure 2

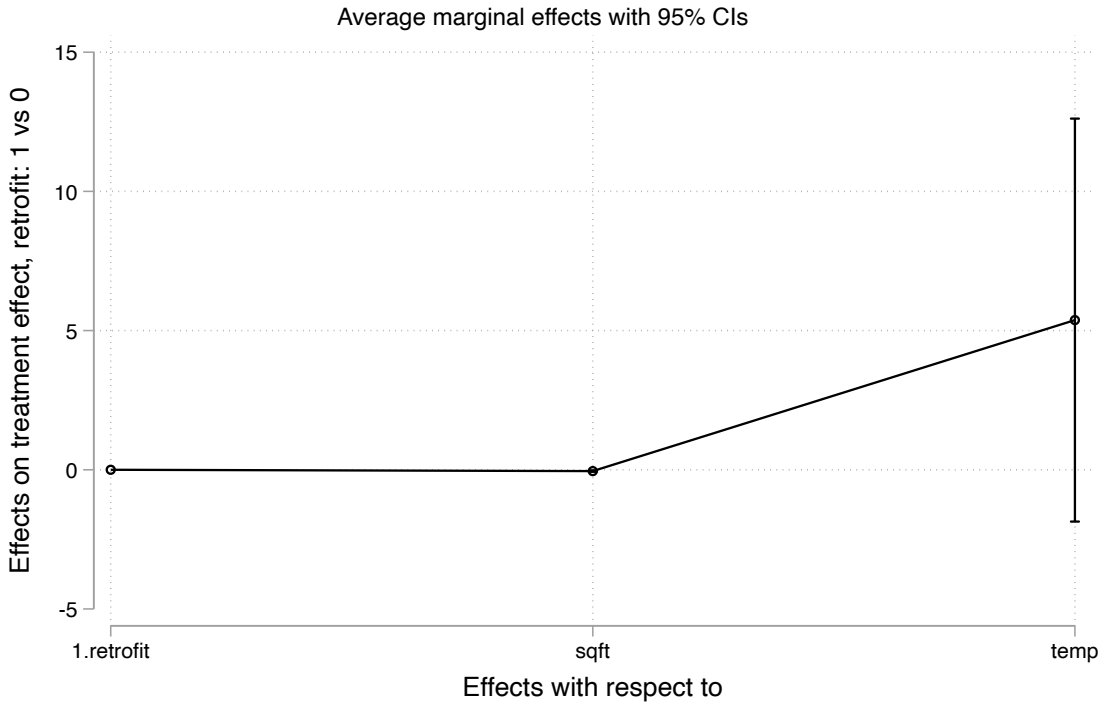
Average marginal effects with 95% CIs
Effects on treatment effect, retrofit: 1 vs 0
15
10
5
0
-5
1.retrofit
sqft
temp
Effects with respect to

Figure 2