Counterfactuals

May 3, 2024

Here's how I did the counterfactual prediction. As the equation for outcome y given is by

$$y_{1940-70} = \frac{y1970}{pop1970/10000} - \frac{y1940}{pop1940/10000}$$

I applied the following transformations to the predicted values $\hat{y}_{1940-70}$ from our IV regression:

$$\hat{y}_{1940-70} = \frac{y_{1970}}{pop_{1970}/10000} - \frac{y_{1940}}{pop_{1940}/10000}$$

$$\hat{y}_{1940-70} + \frac{y_{1940}}{pop_{1940}/10000} = \frac{y_{1970}}{pop_{1970}/10000}$$

$$(pop_{1970}/10000) * (\hat{y}_{1940-70} + \frac{y_{1940}}{pop_{1940}/10000}) = y_{1970}$$

$$(pop_{1970}/10000) * (\hat{y}_{1940-70} + \frac{y_{1940}}{pop_{1940}/10000}) - y_{1940} = y_{1970} - y_{1940}$$

$$counterfactual\_change = real\_change$$

The results are given in the following table in raw jurisdictions.

	counterfactual_change	real_change	difference
cgoodman	1.722483	7.246154	-5.523671
gen_muni	-4.678879	5.392308	-10.07119
gen_town	-26.91674	-1.115385	-25.80136
schdist_ind	-670.9679	-289.9	-381.0679
spdist	84.71674	52.42308	32.29367