

Note to Lecture # 6.

Political Economics NES 2005

On the direction of the bias in estimation of Senators' weight placed on voter preferences.

Suppose our structural relationship is:

$$V_{it}^{Sen} = \alpha^{Sen} S_{it} + Z_i^{Sen} \quad (1)$$

where

V_{it}^{Sen} - equilibrium voting pattern of the Senator i in year t

S_{it} - true preferences of voters of the state where the Senator i is from in year t

α^{Sen} - the true weight that Senators place on voter preferences

Z_i^{Sen} - Senator's ideology times the weight the Senator places on it: $(1 - \alpha^{Sen})$

The only imperfect measure of S_{it} available is V_{it}^{HR} (the voting pattern of the House of Representatives members from the same state).

Thus, our estimated relationship is:

$$V_{it}^{Sen} = \hat{\alpha}^{Sen} V_{it}^{HR} + Z_i^{Sen}, \text{ where } \hat{\alpha}^{Sen} \text{ is our estimator for } \alpha^{Sen}$$

But, we know that:

$$V_{it}^{HR} = \alpha^{HR} S_{it} + Z_i^{HR} \text{ (all variables defined analogously)}$$

Thus,

$$\begin{aligned} V_{it}^{Sen} &= \hat{\alpha}^{Sen} V_{it}^{HR} + Z_i^{Sen} = \hat{\alpha}^{Sen} (\alpha^{HR} S_{it} + Z_i^{HR}) + Z_i^{Sen} = \\ &= \hat{\alpha}^{Sen} \alpha^{HR} S_{it} + \hat{\alpha}^{Sen} Z_i^{HR} + Z_i^{Sen} \end{aligned} \quad (2)$$

Therefore, from (1) and (2) our true weight $\alpha^{Sen} = \hat{\alpha}^{Sen} \alpha^{HR}$

This means that our estimator is biased upwards:

$$\hat{\alpha}^{Sen} = \frac{\alpha^{Sen}}{\alpha^{HR}} > \alpha^{Sen} \text{ as long as } \alpha^{HR} < 1$$