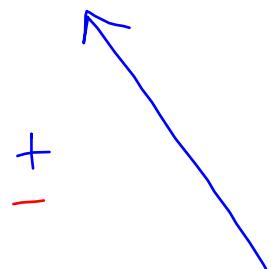


twght  
wage

Dep. var.



smoking  
educ.

indep.

var.



u (includes  
omitted vars.) alcohol

T Q

Bias > 0

Bias < 0

No bias if  $\beta_2 = 0$  or

$x_2$  uncorr. w/  $x_1$ .

More complicated derivation of bias w/ addl. explanatory vars.

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + u$$

env.              input              infrastructure

political  
activism

FDI

zeg.              prices

If  $x_1$  corr. w/  $u$

$x_2, x_3$ : not

OLS estimator biased for all  $\beta$ 's if  $x_1$  corr.  
w/  $x_2$  and  $x_3$

Other sources of bias:

- Measurement error in  $x$  or  $y$   
(e.g., crime, distance, ...)



- Sample selection  
data observed if  $y >$  threshold  
(e.g. trade)

Inclusion of irrelevant regressors :

- Exercise caution

