**Empirical Exercise 10.1**

Calculations for this exercise are carried out in the STATA file **EE\_10\_1.do.**

The solutions will reference the following regression results.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) |
| *Shall* | 0.443 (0.157)  [-0.76, -0.13] | 0.368 (0.114)  [-0.60, -0.14] | 0.0461 (0.042)  [-0.13, 0.04] | 0.0280 (0.041)  [-0.11, 0.05] |
| *controls* | No | Yes | Yes | Yes |
| *State Effects* | No | No | Yes | Yes |
| *Time Effects* | No | No | No | Yes |
| ***F*-Statistics and *p*-values testing exclusion of groups of variables** | | | | |
| Time Effects |  |  |  | 21.6 (0.00) |

Controls: *incar\_rate, density, avginc, Pop, pb1064, pw1064, pm1029*.

(a) (i) The coefficient is 0.368, which suggests that shall-issue laws reduce violent crime by 36%. This is a large effect.

(ii) The coefficient in (1) is 0.443; in (2) it is 0.368. Both are highly statistically significant. Adding the control variables results in a small drop in the coefficient.

(iii) There are several examples. Here are two: Attitudes towards guns and crime, and quality of police and other crime-prevention programs.

(b) In (3) the coefficient on *shall* falls to 0.046, a large reduction in the coefficient from (2). Evidently there was important omitted variable bias in (2). The estimate is not statistically significantly different from zero.

(c) The coefficient falls further to 0.028. The coefficient is insignificantly different from zero. The time effects are jointly statistically significant, so this regression seems better specified than (3).

(d) This table shows the coefficient on *shall* in the regression specifications (1)–(4). Control variables are included in all regressions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Dependent Variable  ln(*rob*) | | | | |
|  | **(1)** | **(2)** | **(3)** | **(4)** |
| *Shall* | 0.773\*\* (0.225) | 0.529\*\* (0.161) | 0.008 (0.055) | 0.027 (0.052) |
| ***F*-Statistics and *p-*values testing exclusion of groups of variables** | | | | |
| *Time Effects* |  |  |  | 25.9 (0.00) |
| **Dependent Variable  ln(*mur*)** | | | | |
| *shall* | 0.473\*\* (0.149) | 0.313\*\* (0.099) | 0.061 (0.037) | 0.015 (0.038) |
| ***F*-Statistics and *p-*values testing exclusion of groups of variables** | | | | |
| *Time Effects* |  |  |  | 19.61 (0.00) |

The quantitative results are similar to the results using violent crimes: there is a large estimated effect of concealed weapons laws in specifications (1) and (2). This effect is spurious and is due to omitted variable bias as specification (3) and (4) show.

(e) There is potential two-way causality between this year’s incarceration rate and the number of crimes. Because this year’s incarceration rate is much like last year’s rate, there is a potential two-way causality problem. There are similar two-way causality issues relating crime and *shall*.

(f) The most credible results are given by regression (4). The 95% confidence interval for *βShall* is 11.0% to 5.3%. This includes *βShall*  0. Thus, there is no statistically significant evidence that concealed weapons laws have any effect on crime rates.