Endogeneity in the Environmental Kuznets Curve: An Instrumental Variables Approach

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APPENDIX B: Figures
FIGURE 1.1: BIOLOGICAL OXYGEN DEMAND VERSUS CIVIL LIBERTIES:

![Biological oxygen demand versus Civil Liberties](image)

**Figure 1.1a**

| Estimate | Std. Error | t value | Pr(>|t|) |
|----------|------------|---------|----------|
| (Intercept) | 4.45337 | 0.82805 | 5.378 | 9.15e-08 *** |
| data$cl | 0.04929 | 0.23234 | 0.212 | 0.832 |

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Signif. codes: 0 `***' 0.001 `**' 0.01 `*' 0.05 `.' 0.1 ` ' 1

Residual standard error: 11.09 on 1125 degrees of freedom
Multiple R-Squared: 4.001e-05, Adjusted R-squared: -0.0008488
F-statistic: 0.04501 on 1 and 1125 DF, p-value: 0.832
Figure 1.1b

Civil Liberties vs. Biological Oxygen Demand by Country
Civil Liberties vs. Biological Oxygen Demand by Development Level

![Graph showing the relationship between Civil Liberties and Biological Oxygen Demand for Non-OECD and OECD regions.](Image)

*Figure 1.1c*
Civil Liberties vs. Biological Oxygen Demand by Year

Figure 1.1d
FIGURE 1.2: BIOLOGICAL OXYGEN DEMAND VERSUS POLITICAL RIGHTS

Biological oxygen demand versus Political Rights

Figure 1.2a

Coefficients:

|                | Estimate | Std. Error | t value | Pr(>|t|)   |
|----------------|----------|------------|---------|------------|
| (Intercept)    | 4.47965  | 0.63968    | 7.003   | 4.30e-12 *** |
| data$pr        | 0.04692  | 0.19065    | 0.246   | 0.806      |

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Signif. codes:  0 `***' 0.001 `**' 0.01 `*' 0.05 `.' 0.1 ` ' 1

Residual standard error: 11.09 on 1125 degrees of freedom
Multiple R-Squared: 5.384e-05,  Adjusted R-squared: -0.000835
F-statistic: 0.06057 on 1 and 1125 DF,  p-value: 0.8056
Political Rights vs. Biological Oxygen Demand by Country

Figure 1.2b
Political Rights vs. Biological Oxygen Demand by Development Level

Figure 1.2c
Figure 1.2d

Political Rights vs. Biological Oxygen Demand by Year

Biological oxygen demand (mg/L O2)

Political Rights (1 = best, 7 = worst)
FIGURE 1.3: BIOLOGICAL OXYGEN DEMAND VERSUS PER CAPITA GDP

Biological oxygen demand versus per capita GDP (1995 US$)

Figure 1.3a

Coefficients:

|                | Estimate | Std. Error | t value | Pr(>|t|) |
|----------------|----------|------------|---------|----------|
| (Intercept)    | 4.910e+00| 4.739e-01  | 10.362  | <2e-16 ***|
| data$gdp       | -4.283e-05| 4.712e-05  | -0.909  | 0.364    |

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Signif. codes:  0 `***' 0.001 `**' 0.01 `*' 0.05 `.' 0.1 ` ' 1

Residual standard error: 11.1 on 1120 degrees of freedom
Multiple R-Squared: 0.0007369, Adjusted R-squared: -0.0001553
F-statistic: 0.826 on 1 and 1120 DF, p-value: 0.3636
Figure 1.3b
Figure 1.3c
Figure 1.3d: GDP Per Capita vs. Biological Oxygen Demand by Year
Figure 2.1a

Coefficients:

| Estimate | Std. Error | t value | Pr(>|t|) |
|----------|------------|---------|----------|
| (Intercept) | 21.248 | 3.503 | 6.065 | 1.95e-09 *** |
| data$cl | 1.690 | 1.047 | 1.614 | 0.107 |

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Signif. codes: 0 `***' 0.001 `**' 0.01 `*' 0.05 `.' 0.1 ` ' 1

Residual standard error: 40.34 on 887 degrees of freedom
Multiple R-Squared: 0.002927, Adjusted R-squared: 0.001803
F-statistic: 2.604 on 1 and 887 DF,  p-value: 0.1069
Figure 2.1c

Civil Liberties vs. Chemical Oxygen Demand by Development Level

Chemical oxygen demand (mg/L O2)

Civil Liberties (1 = best, 7 = worst)

Non-OECD

OECD
Civil Liberties vs. Chemical Oxygen Demand by Year

Figure 2.1d
Figure 2.2a

(Intercept)  21.9407     2.6211   8.371   <2e-16 ***
data$pr       1.7372     0.8627   2.014   0.0444 *

Signif. codes:  0 `***' 0.001 `**' 0.01 `*' 0.05 `.' 0.1 ` ' 1

Residual standard error: 40.31 on 887 degrees of freedom
Multiple R-Squared: 0.00455, Adjusted R-squared: 0.003428
F-statistic: 4.055 on 1 and 887 DF,  p-value: 0.04435
Figure 2.2b

Political Rights vs. Chemical Oxygen Demand by Country

Chemical oxygen demand (mg/L O2)

Political Rights (1 = best, 7 = worst)
Figure 2.2c

Political Rights vs. Chemical Oxygen Demand by Development Level

Chemical oxygen demand (mg/L CO2)

Political Rights (1 = best, 7 = worst)
Political Rights vs. Chemical Oxygen Demand by Year

Figure 2.2d
Figure 2.3a

Coefficients:

| Estimate | Std. Error | t value | Pr(>|t|) |
|----------|------------|---------|----------|
| (Intercept) 29.8442071 | 1.9279640 | 15.480 | <2e-16 *** |
| data$gdp -0.0004416 | 0.0001850 | -2.387 | 0.0172 * |

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Signif. codes: 0 `***' 0.001 `**' 0.01 `*' 0.05 `.-' 0.1 ` ' 1

Residual standard error: 40.33 on 883 degrees of freedom
Multiple R-Squared: 0.006412, Adjusted R-squared: 0.005286
F-statistic: 5.698 on 1 and 883 DF, p-value: 0.01719

[1] "coef.vec: 886.929653966824"  "coef.vec: -0.432628405197114"
GDP Per Capita vs. Chemical Oxygen Demand by Country

Figure 2.3b
Figure 2.3c
GDP Per Capita vs. Chemical Oxygen Demand by Year

Figure 2.3d
FIGURE 3.1: DISSOLVED OXYGEN VERSUS CIVIL LIBERTIES

**Dissolved oxygen versus Civil Liberties**

![Graph showing dissolved oxygen versus civil liberties](image)

**Figure 3.1a**

Coefficients:

|                     | Estimate | Std. Error | t value | Pr(>|t|) |
|---------------------|----------|------------|---------|----------|
| (Intercept)         | 9.91307  | 0.19334    | 51.27   | <2e-16 *** |
| data$cl             | -0.68768 | 0.05503    | -12.50  | <2e-16 *** |

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Signif. codes:  0 `***' 0.001 `**' 0.01 `*' 0.05 `. `' 0.1 ` ' 1

Residual standard error: 3.148 on 1404 degrees of freedom
Multiple R-Squared: 0.1001, Adjusted R-squared: 0.09946
F-statistic: 156.2 on 1 and 1404 DF, p-value: < 2.2e-16
Figure 3.1b: Civil Liberties vs. Dissolved Oxygen by Country.
Figure 3.1c

Civil Liberties vs. Dissolved Oxygen by Development Level

Dissolved oxygen (mg/L O2)

Civil Liberties (1 = best, 7 = worst)
Figure 3.1d

Civil Liberties vs. Dissolved Oxygen by Year

Dissolved oxygen (mg/L O2)

Civil Liberties (1 = best, 7 = worst)
**FIGURE 3.2: DISSOLVED OXYGEN VERSUS POLITICAL RIGHTS**

Dissolved oxygen versus Political Rights

![Graph showing dissolved oxygen versus political rights](image)

**Figure 3.2a**

| Estimate | Std. Error | t value | Pr(>|t|) |
|----------|------------|---------|----------|
| (Intercept) | 9.15101 | 0.16014 | 57.14 | <2e-16 *** |
| data$pr | -0.49780 | 0.04771 | -10.44 | <2e-16 *** |

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Signif. codes: 0 `***' 0.001 `**' 0.01 `*' 0.05 `.' 0.1 ` ' 1

Residual standard error: 3.197 on 1404 degrees of freedom
Multiple R-Squared: 0.07197, Adjusted R-squared: 0.07131
F-statistic: 108.9 on 1 and 1404 DF, p-value:<2.2e-16
Figure 3.2b

Political Rights vs. Dissolved Oxygen by Country

Dissolved oxygen (mg/L O2)

Political Rights (1 = best, 7 = worst)
Figure 3.2c
Figure 3.2d

Political Rights vs. Dissolved Oxygen by Year

Dissolved oxygen (mg/L O₂)

Political Rights (1 = best, 7 = worst)
FIGURE 3.3: DISSOLVED OXYGEN VERSUS PER CAPITA GDP

Dissolved oxygen versus per capita GDP (1995 US$)

Figure 3.3a

| Estimate | Std. Error | t value | Pr(>|t|) |
|----------|------------|---------|----------|
| (Intercept) 6.2282329 | 0.1166342 | 53.40 | <2e-16 *** |
| data$gdp 0.0001841 | 0.0000103 | 17.87 | <2e-16 *** |

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Signif. codes:  0 `***' 0.001 `**' 0.01 `*' 0.05 `.' 0.1 ` ' 1

Residual standard error: 2.993 on 1388 degrees of freedom
Multiple R-Squared: 0.1871,  Adjusted R-squared: 0.1865
F-statistic: 319.5 on 1 and 1388 DF,  p-value: < 2.2e-16
Figure 3.3b
GDP Per Capita vs. Dissolved Oxygen by Development Level

Figure 3.3c
GDP Per Capita vs. Dissolved Oxygen by Year

Figure 3.3d
FIGURE 4.1: NITRATE VERSUS CIVIL LIBERTIES

Nitrate versus Civil Liberties

Figure 4.1a

|                | Estimate | Std. Error | t value | Pr(>|t|) |
|----------------|----------|------------|---------|----------|
| (Intercept)    | 55311    | 35589      | 1.554   | 0.131    |
| data$cl        | -5887    | 10798      | -0.545  | 0.586    |

Residual standard error: 314500 on 633 degrees of freedom
Multiple R-Squared: 0.0004694, Adjusted R-squared: -0.00111
F-statistic: 0.2973 on 1 and 633 DF, p-value: 0.5858
Civil Liberties vs. Nitrate by Development Level

Figure 4.1c
Civil Liberties vs. Nitrate by Year

Figure 4.1d
FIGURE 4.2: NITRATE VERSUS POLITICAL RIGHTS

|                  | Estimate | Std. Error | t value | Pr(>|t|)   |
|------------------|----------|------------|---------|------------|
| (Intercept)      | 4.5603   | 0.5094     | 8.953   | < 2e-16 ***|
| data$pr          | -0.6712  | 0.1294     | -5.185  | 4.46e-07 ***|

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Signif. codes:  0 `***' 0.001 `**' 0.01 `*' 0.05 `.' 0.1 ` ' 1

Residual standard error: 3.896 on 249 degrees of freedom
Multiple R-Squared: 0.09746, Adjusted R-squared: 0.09384
F-statistic: 26.89 on 1 and 249 DF,  p-value: 4.462e-07
Political Rights vs. Nitrate by Development Level

Figure 4.2c
FIGURE 4.3: NITRATE VERSUS PER CAPITA GDP

Nitrate versus per capita GDP (1995 US$)

Figure 4.3a

|                | Estimate | Std. Error | t value | Pr(>|t|) |
|----------------|----------|------------|---------|----------|
| (Intercept)    | -1.922e-01 | 3.288e-01  | -0.585  | 0.559    |
| data$gdp       | 3.104e-04  | 3.221e-05  | 9.637   | <2e-16   ***|

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Signif. codes:  0 `***' 0.001 `**' 0.01 `*' 0.05 `.' 0.1 ` ' 1

Residual standard error: 3.425 on 248 degrees of freedom
Multiple R-Squared: 0.2725,  Adjusted R-squared: 0.2695  
F-statistic: 92.87 on 1 and 248 DF,  p-value: < 2.2e-16
GDP Per Capita vs. Nitrate by Country

Figure 4.3b
GDP Per Capita vs. Nitrate by Development Level

![Graph showing the relationship between GDP per capita and nitrate levels for Non-OECD and OECD countries.](image)

Figure 4.3c
GDP Per Capita vs. Nitrate by Year

Figure 4.3d
Figure 5.1a

|                | Estimate | Std. Error | t value | Pr(>|t|) |
|----------------|----------|------------|---------|----------|
| (Intercept)    | 0.002904 | 0.005149   | 0.564   | 0.573    |
| data$cl        | 0.002248 | 0.001554   | 1.447   | 0.150    |

Residual standard error: 0.03522 on 207 degrees of freedom
Multiple R-Squared: 0.01001, Adjusted R-squared: 0.005225
F-statistic: 2.092 on 1 and 207 DF, p-value: 0.1495
Civil Liberties vs. Total Arsenic by Country

Figure 5.1b
Figure 5.1c
Figure 5.1d

**Civil Liberties vs. Total Arsenic by Year**

- **1989**
- **1992**
- **1995**

**Total arsenic (mg/L As)**

**Civil Liberties (1 = best, 7 = worst)**

- **1980**
- **1983**
- **1985**
Figure 5.2a

Estimate Std. Error t value Pr(>|t|)
(Intercept) 0.003122  0.004124   0.757   0.4499
data$pr     0.002545   0.001338   1.902   0.0585 .

Signif. codes:  0 `***' 0.001 `**' 0.01 `*' 0.05 `. ' 0.1 ` ' 1

Residual standard error: 0.03509 on 207 degrees of freedom
Multiple R-Squared: 0.01718,  Adjusted R-squared: 0.01243
F-statistic: 3.619 on 1 and 207 DF,  p-value: 0.05851
Figure 5.2b
Figure 5.2c

Political Rights vs. Total Arsenic by Development Level

Non-OECD

Total arsenic (mg/L As)

Political Rights (1 = best, 7 = worst)
Figure 5.2d
FIGURE 5.3: TOTAL ARSENIC VERSUS PER CAPITA GDP

Total arsenic versus per capita GDP (1995 US$)

Figure 5.3a

Estimate Std. Error t value Pr(>|t|)
(Intercept) 1.626e-02 4.340e-03 3.747 0.000232 ***
data$gdp -5.995e-07 3.174e-07 -1.889 0.060281 .

---

Signif. codes: 0 `***' 0.001 `**' 0.01 `*' 0.05 `.' 0.1 ` ' 1

Residual standard error: 0.0351 on 207 degrees of freedom
Multiple R-Squared: 0.01695, Adjusted R-squared: 0.0122
F-statistic: 3.569 on 1 and 207 DF, p-value: 0.06028
GDP Per Capita vs. Total Arsenic by Country

Figure 5.3b
Figure 5.3c: GDP Per Capita vs. Total Arsenic by Development Level

The graph shows the relationship between per capita GDP (1995 US$) and total arsenic levels (mg/L As) for Non-OECD and OECD countries. The data points indicate a varying trend between GDP and arsenic levels across different countries.
Figure 5.3d

GDP Per Capita vs. Total Arsenic by Year

Per Capita GDP (1995 US$)

Total arsenic (mg/L As)

1980 1983 1985

Figure 6.1a

|                  | Estimate | Std. Error | t value | Pr(>|t|)   |
|------------------|----------|------------|---------|-----------|
| (Intercept)      | 0.056169 | 0.011223   | 5.005   | 7.87e-07  *** |
| data$cl          | -0.011024| 0.004083   | -2.700  | 0.00718   ** |

Signif. codes: 0 `***' 0.001 `**' 0.01 `*' 0.05 `.' 0.1 ` ' 1

Residual standard error: 0.1278 on 479 degrees of freedom
Multiple R-Squared: 0.01499, Adjusted R-squared: 0.01293
F-statistic: 7.29 on 1 and 479 DF, p-value: 0.007181
Figure 6.1b

Civil Liberties vs. Total Cadmium by Country

Total cadmium (mg/L Cd)

Civil Liberties (1 = best, 7 = worst)
Civil Liberties versus Total Cadmium by Development Level

Figure 6.1c
Civil Liberties vs. Total Cadmium by Year
FIGURE 6.2: TOTAL CADMIUM VERSUS POLITICAL RIGHTS

Total cadmium versus Political Rights

Figure 6.2a

Estimate Std. Error t value Pr(>|t|)
(Intercept) 0.045442 0.009282 4.896 1.34e-06 ***
data$pr -0.007747 0.003682 -2.104 0.0359 *

---
Signif. codes: 0 `***' 0.001 `**' 0.01 `*' 0.05 `.' 0.1 ` ' 1

Residual standard error: 0.1282 on 479 degrees of freedom
Multiple R-Squared: 0.009155, Adjusted R-squared: 0.007086
F-statistic: 4.426 on 1 and 479 DF, p-value: 0.03593
Figure 6.2b: Political Rights vs. Total Cadmium by Country
Political Rights vs. Total Cadmium by Development Level

Figure 6.2c
Figure 6.2d
FIGURE 6.3: TOTAL CADMIUM VERSUS PER CAPITA GDP

Total cadmium versus per capita GDP (1995 US$)

Figure 6.3a

Estimate Std. Error t value Pr(>|t|)
(Intercept) 6.418e-03 1.234e-02 0.520 0.6034
data$gdp 1.800e-06 8.206e-07 2.193 0.0288 *

---

Signif. codes: 0 `***' 0.001 `**' 0.01 `*' 0.05 `.' 0.1 ` ' 1

Residual standard error: 0.1281 on 479 degrees of freedom
Multiple R-Squared: 0.009944, Adjusted R-squared: 0.007877
F-statistic: 4.811 on 1 and 479 DF, p-value: 0.02876
Figure 6.3b

GDP Per Capita vs. Total Cadmium by Country

Per Capita GDP (1995 US$)
Figure 6.3c
GDP Per Capita vs. Total Cadmium by Year

Figure 6.3d
FIGURE 7.1: TOTAL LEAD VERSUS CIVIL LIBERTIES

Figure 7.1a

|          | Estimate | Std. Error | t value | Pr(>|t|) |
|----------|----------|------------|---------|----------|
| (Intercept) | -0.010410 | 0.008523 | -1.221  | 0.223    |
| data$cl   | 0.015322  | 0.002864  | 5.351   | 1.6e-07  *** |

---

Signif. codes:  0 `***' 0.001 `**' 0.01 `*' 0.05 `.' 0.1 ` ' 1

Residual standard error: 0.08055 on 345 degrees of freedom
Multiple R-Squared: 0.07662, Adjusted R-squared: 0.07395
F-statistic: 28.63 on 1 and 345 DF,  p-value: 1.601e-07
Figure 7.1b

Civil Liberties vs. Total Lead by Country

Total lead (mg/L Pb)

Civil Liberties (1 = best, 7 = worst)

Thailand          Turkey          UK

Indonesia         Malaysia        Morocco

Brazil            Finland         Hungary
Civil Liberties versus Total Lead by Development Level

Figure 7.1c
Civil Liberties vs. Total Lead by Year

Figure 7.1d
Figure 7.2a

| Estimate | Std. Error | t value | Pr(>|t|) |
|----------|------------|---------|----------|
| (Intercept) | -0.008145 | 0.006976 | -1.168 | 0.244 |
| data$pr | 0.016517 | 0.002473 | 6.680 | 9.6e-11 *** |

Signif. codes:  0 `***' 0.001 `**' 0.01 `*' 0.05 `.' 0.1 ` ' 1

Residual standard error: 0.07888 on 345 degrees of freedom
Multiple R-Squared: 0.1145, Adjusted R-squared: 0.112
F-statistic: 44.62 on 1 and 345 DF, p-value: 9.6e-11
Political Rights vs. Total Lead by Country

Figure 7.2b
Political Rights versus Total Lead by Development Level

Figure 7.2c
Figure 7.2d
FIGURE 7.3: TOTAL LEAD VERSUS PER CAPITA GDP

**Figure 7.3a**

| Estimate | Std. Error | t value | Pr(>|t|)     |
|----------|------------|---------|--------------|
| (Intercept) | 7.307e-02  | 8.175e-03 | 8.938 < 2e-16 *** |
| data$gdp | -3.637e-06 | 5.744e-07 | -6.332 7.53e-10 *** |

Signif. codes:  0 `***' 0.001 `**' 0.01 `*' 0.05 `.' 0.1 ` ' 1

Residual standard error: 0.07934 on 345 degrees of freedom
Multiple R-Squared: 0.1041, Adjusted R-squared: 0.1015
F-statistic: 40.1 on 1 and 345 DF, p-value: 7.532e-10
Figure 7.3b
Figure 7.3c
Figure 7.3d
FIGURE 8.1: TOTAL MERCURY VERSUS CIVIL LIBERTIES

Total mercury versus Civil Liberties

Total mercury (μg/L Hg)

Civil Liberties (1 = best, 7 = worst)

Figure 8.1a

Estimate Std. Error t value Pr(>|t|)
(Intercept)  0.29835    0.08838   3.376 0.000806 ***
data$cl      0.03746    0.03779   0.991 0.322165

---

Signif. codes:  0 `***' 0.001 `**' 0.01 `*' 0.05 `.' 0.1 ` ' 1

Residual standard error: 0.9012 on 415 degrees of freedom
Multiple R-Squared: 0.002362, Adjusted R-squared: -4.212e-05
F-statistic: 0.9825 on 1 and 415 DF,  p-value: 0.3222
Figure 8.1b

Civil Liberties vs. Total Mercury by Country

- Morocco
- Spain
- Thailand
- UK
- Hungary
- Indonesia
- Italy
- Malaysia
- Argentina
- Brazil
- China
- Finland

Trends indicate correlation between civil liberties and total mercury levels across different countries.
Civil Liberties vs. Total Mercury by Development Level

Figure 8.1c
Civil Liberties vs. Total Mercury by Year

Figure 8.1d
**Figure 8.2: Total Mercury versus Political Rights**

Total mercury versus Political Rights

![Graph showing the relationship between total mercury and political rights](image)

**Figure 8.2a**

|                | Estimate | Std. Error | t value | Pr(>|t|) |
|----------------|----------|------------|---------|----------|
| (Intercept)    | 0.33240  | 0.07313    | 4.545   | 7.2e-06  *** |
| data$pr        | 0.02648  | 0.03689    | 0.718   | 0.473    |

---

Signif. codes: 0 `***' 0.001 `**' 0.01 `*' 0.05 `.' 0.1 ` ' 1

Residual standard error: 0.9017 on 415 degrees of freedom
Multiple R-Squared: 0.00124, Adjusted R-squared: -0.001166
F-statistic: 0.5154 on 1 and 415 DF,  p-value: 0.4732
Figure 8.2b

Political Rights vs. Total Mercury by Country

Morocco  |  Poland  |  Thailand
---------|----------|---------
|         |          |         |
Hungary  |  Malaysia |  Mexico
|         |          |         |
Brazil   |  China    |  Finland
|         |          |         |

Total mercury (ug/L Hg)

Political Rights (1 = best, 7 = worst)
Figure 8.2c
Figure 8.2d
**Figure 8.3a**

|            | Estimate | Std. Error | t value | Pr(>|t|) |
|------------|----------|------------|---------|----------|
| (Intercept)| 4.463e-01| 1.126e-01  | 3.962   | 8.74e-05 *** |
| data$gdp  | -4.927e-06| 7.089e-06  | -0.695  | 0.487    |

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Signif. codes:  0 `***' 0.001 `**' 0.01 `*' 0.05 `.' 0.1 ` ' 1

Residual standard error: 0.9017 on 415 degrees of freedom
Multiple R-Squared: 0.001162, Adjusted R-squared: -0.001244
F-statistic: 0.483 on 1 and 415 DF,  p-value: 0.4875
Figure 8.3b

GDP Per Capita vs. Total Mercury by Country

Per Capita GDP (1995 US$) vs. Total Mercury (ug/L Hg)

Spain | Thailand | UK | US
--- | --- | --- | ---
Malaysia | Mexico | Morocco | Netherlands | Poland
France | Hungary | Indonesia | Ireland | Italy
Argentina | Australia | Brazil | China | Finland

Figure 8.3b
Figure 8.3c
Figure 9.1a

|                | Estimate | Std. Error | t value | Pr(>|t|) |
|----------------|----------|------------|---------|----------|
| (Intercept)    | 0.0007747| 0.0028108  | 0.276   | 0.783    |
| data$cl        | 0.0063823| 0.0011054  | 5.774   | 5.48e-08 *** |

Signif. codes:  0 `***' 0.001 `**' 0.01 `*' 0.05 `.' 0.1 ` ' 1

Residual standard error: 0.01815 on 129 degrees of freedom
Multiple R-Squared: 0.2053,    Adjusted R-squared: 0.1992
F-statistic: 33.33 on 1 and 129 DF,  p-value: 5.484e-08
Civil Liberties vs. Total Nickel by Country

Figure 9.1b
Figure 9.1c

Civil Liberties vs. Total Nickel by Development Level

Non-OECD

Total nickel (mg/L Ni)

Civil Liberties (1 = best, 7 = worst)
Civil Liberties vs. Total Nickel by Year

Figure 9.1d
FIGURE 9.2: TOTAL NICKEL VERSUS POLITICAL RIGHTS

Total nickel versus Political Rights

|             | Estimate | Std. Error | t value | Pr(>|t|) |
|-------------|----------|------------|---------|----------|
| (Intercept) | 0.004672 | 0.002354   | 1.985   | 0.0493 * |
| data$pr     | 0.004979 | 0.000904   | 5.507   | 1.90e-07 *** |

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Signif. codes:  0 `***' 0.001 `**' 0.01 `*' 0.05 `.' 0.1 ` ' 1

Residual standard error: 0.01832 on 129 degrees of freedom
Multiple R-Squared: 0.1904,  Adjusted R-squared: 0.1841
F-statistic: 30.33 on 1 and 129 DF,  p-value: 1.896e-07
Political Rights vs. Total Nickel by Country

Figure 9.2b
Figure 9.2c: Political Rights vs. Total Nickel by Development Level.
Political Rights vs. Total Nickel by Year

Figure 9.2d
FIGURE 9.3: TOTAL NICKEL VERSUS PER CAPITA GDP

**Total nickel versus per capita GDP (1995 US$)**

![Graph showing the relationship between total nickel and per capita GDP.](image)

**Figure 9.3a**

| Estimate  | Std. Error | t value | Pr(>|t|) |
|-----------|------------|---------|----------|
| (Intercept) | 2.995e-02  | 3.568e-03 | 8.396 | 7.15e-14 *** |
| data$gdp   | -1.152e-06 | 2.317e-07 | -4.972 | 2.06e-06 *** |

Signif. codes: 0 `***' 0.001 `**' 0.01 `*' 0.05 `. ' 0.1 ` ' 1

Residual standard error: 0.01866 on 129 degrees of freedom
Multiple R-Squared: 0.1608, Adjusted R-squared: 0.1543
F-statistic: 24.73 on 1 and 129 DF, p-value: 2.064e-06
Figure 9.3b
Figure 9.3c
GDP Per Capita vs. Total Nickel by Year

Figure 9.3d
FIGURE 10.1: TOTAL COLIFORMS VERSUS CIVIL LIBERTIES

Total coliforms versus Civil Liberties

|                | Estimate | Std. Error | t value | Pr(>|t|) |
|----------------|----------|------------|---------|----------|
| (Intercept)    | 55311    | 35589      | 1.554   | 0.121    |
| data$cl        | -5887    | 10798      | -0.545  | 0.586    |

Residual standard error: 314500 on 633 degrees of freedom
Multiple R-Squared: 0.0004694,  Adjusted R-squared: -0.00111
F-statistic: 0.2973 on 1 and 633 DF,  p-value: 0.5858
Figure 10.1b
Civil Liberties versus Total Coliform by Development Level

Figure 10.1c
Figure 10.1d
**FIGURE 10.2: TOTAL COLIFORMS VERSUS POLITICAL RIGHTS**

![Graph showing total coliforms versus political rights](image)

**Figure 10.2a**

| Estimate | Std. Error | t value | Pr(>|t|) |
|----------|------------|---------|----------|
| (Intercept) | 15552 | 25993 | 0.598 | 0.550 |
| data$pr | 8546 | 9028 | 0.947 | 0.344 |

Residual standard error: 314300 on 633 degrees of freedom
Multiple R-Squared: 0.001414, Adjusted R-squared: -0.0001638
F-statistic: 0.8961 on 1 and 633 DF, p-value: 0.3442
Figure 10.2b

Political Rights vs. Total Coliform by Country

<table>
<thead>
<tr>
<th>Mali</th>
<th>Morocco</th>
<th>Pakistan</th>
<th>Thailand</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ghana</td>
<td>Hungary</td>
<td>India</td>
<td>Malaysia</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Brazil</td>
<td>Chile</td>
<td>China</td>
<td>Colombia</td>
</tr>
</tbody>
</table>

Total coliforms (No./100ml)

Political Rights (1 = best, 7 = worst)
Figure 10.2c
Figure 10.2d
FIGURE 10.3: TOTAL COLIFORMS VERSUS PER CAPITA GDP

Total coliforms versus per capita GDP (1995 US$)

Figure 10.3a—(Colombia, Mexico are outliers)

Estimate Std. Error t value Pr(>|t|)
(Intercept) 26260.040 16813.342 1.562 0.119
data$gdp 1.814 1.853 0.979 0.328

Residual standard error: 314800 on 631 degrees of freedom
Multiple R-Squared: 0.001517, Adjusted R-squared: -6.515e-05
F-statistic: 0.9588 on 1 and 631 DF, p-value: 0.3279
Figure 10.3b
GDP Per Capita vs. Total Coliform by Year

Figure 10.3d
Figure 11.1a

|                | Estimate | Std. Error | t value | Pr(>|t|) |
|----------------|----------|------------|---------|----------|
| (Intercept)    | -4530    | 10760      | -0.421  | 0.67376  |
| data$cl        | 8614     | 3060       | 2.815   | 0.00497  ** |

Signif. codes: 0 `***' 0.001 `**' 0.01 `*' 0.05 `. ' 0.1 ` ' 1

Residual standard error: 145400 on 1029 degrees of freedom
Multiple R-Squared: 0.007643, Adjusted R-squared: 0.006679
F-statistic: 7.926 on 1 and 1029 DF, p-value: 0.004967
Figure 11.1b

Civil Liberties vs. Fecal Coliform by Country

Fecal coliform (No/100ml)

Civil Liberties (1 = best, 7 = worst)
Civil Liberties vs. Fecal Coliform by Development Level

Figure 11.1c
Figure 11.1d
**FIGURE 11.2: FECAL COLIFORM VERSUS POLITICAL RIGHTS**

**Fecal coliform versus Political Rights**

```
Estimate Std. Error t value Pr(>|t|)
(Intercept)     2302       8709   0.264  0.79162
data$pr         7295       2628   2.775  0.00561 **
---
Signif. codes:  0 `***' 0.001 `**' 0.01 `*' 0.05 `.' 0.1 ` ' 1

Residual standard error: 145400 on 1029 degrees of freedom
Multiple R-Squared: 0.007431, Adjusted R-squared: 0.006466
F-statistic: 7.703 on 1 and 1029 DF,  p-value: 0.005612
```
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<thead>
<tr>
<th>Country</th>
<th>Fecal Coliform (No./100ml)</th>
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</thead>
<tbody>
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<tr>
<td>Tunisia</td>
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<tr>
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<td>Iran</td>
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<td>Colombia</td>
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<tr>
<td>Brazil</td>
<td>0</td>
</tr>
<tr>
<td>Chile</td>
<td>0</td>
</tr>
</tbody>
</table>

**Political Rights vs. Fecal Coliform by Country**

*Figure 11.2b*
Figure 11.2c
Figure 11.2d
**FIGURE 11.3: FECAL COLIFORM VERSUS PER CAPITA GDP**

**Fecal coliform versus per capita GDP (1995 USS)**

| Estimate  | Std. Error | t value | Pr(>|t|) |
|-----------|------------|---------|----------|
| (Intercept) | 33240.7371 | 6433.3546 | 5.267 | 2.86e-07 *** |
| data$gdp  | -1.3256 | 0.5927 | -2.236 | 0.0255 * |

---

Signif. codes: 0 `***' 0.001 `**' 0.01 `*' 0.05 `.' 0.1 ` ' 1

Residual standard error: 146100 on 1022 degrees of freedom
Multiple R-Squared: 0.00487, Adjusted R-squared: 0.003896
F-statistic: 5.002 on 1 and 1022 DF,  p-value: 0.02554
F-statistic: 14.84 on 1 and 1029 DF,  p-value: 0.0001245
GDP Per Capita vs. Fecal Coliform by Country

Per Capita GDP (1995 US$)

Fecal coliform (N/100ml)

Uruguay, US, Philippines, Poland, Spain, Thailand, Tunisia, Turkey, UK, Malaysia, Mexico, Morocco, Netherlands, Norway, Pakistan, Panama, Guatemala, Hungary, India, Indonesia, Iran, Ireland, Italy, Colombia, Denmark, Ecuador, Fiji, Finland, France, Ghana, Argentina, Australia, Bangladesh, Bolivia, Brazil, Chile, China

Figure 5.3b
Figure 11.3c
GDP Per Capita vs. Fecal Coliform by Year

Figure 11.3d