Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ECO 141

Spring 2016

**Homework 5**

1. Consider an equation to explain salaries of CEO’s in terms of annual firm sales, return on equity (*roe*, in percent form), and return on the firm’s stock (*ros*, in percent form):



1. Using the data in CEOSAL.xxx, estimate the equation by OLS. Write the estimated equation in a standard form, including the standard errors, coefficient of determination and sample size.
2. State and test the hypothesis that return on equity has the same effect on CEO’s salary as the return on stock holding sales constant. Explain every step.
3. Would you reject the null hypothesis that all three independent variables explain a substantial variation in the CEO salaries? Show your calculations.
4. Consider the following two models:

+ + ui

= +

1. Prove that = , = , and =
2. Prove that the least-squares residuals are identical, that is, for all *i*.
3. In this homework problem you will investigate the relationship between income per capita and democracy. Is higher *GDP* per capita associated with more democracy or can influx of money (for example in resource rich countries) slow down democratic reforms?

Use the data in file ***hw5.xxx.*** This is a panel data set for the years 1960-2000 that includes the variables described in Table 1.

**Table 1.**

**DATA DESCRIPTION, FILE: hw5.xxx**

|  |  |
| --- | --- |
| **Variable name** | **Variable Description** |
| *fhpolr* | Freedom House Political Rights Index - measure of democracy. Normalized to range from 0 to 1 |
| *lrgdppc* | *ln* of GDP per capita (chain weighted 1996 prices) |
| *laborshare* | Labor share of value added |
| *lpop* | *ln* of total population |
| *socialism* | Dummy variable = 1 if political regime is socialism |
| *code\_numeric* | Country numerical code |

1. Table 2 presents the results of five regressions, one in each column. Estimate the indicated regressions and fill in the values (type the entries in).

**Table 2. Regression Results**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Method** | **(1)**  **OLS** | **(2)**  **OLS** | **(3)**  **FE** | **(4)**  **FE** | **(5)**  **FE** |
| Dependent variable: |  |  |  |  |  |
|  | ( ) | ( ) | ( ) | ( ) | ( ) |
|  | ( ) | ( ) | ( ) | ( ) | ( ) |
|  |  |  |  |  | ( ) |
| *lpopt-1* |  |  |  |  | ( ) |
| *socialism* |  |  |  |  | ( ) |
| State dummies? | *No* | *No* | *No* | *Yes* | *Yes* |
| Year dummies? | *No* | *Yes* | *Yes* | *Yes* | *Yes* |
| *R2* |  |  |  |  |  |
| *RSS* |  |  |  |  |  |
| *n* |  |  |  |  |  |
| Standard errors |  |  | cluster | cluster | cluster |

*Notes*: The dependent variable for each regression is given in the first row. All regressions include an intercept. Standard errors (given in parentheses below regression coefficients) are either regular or clustered standard errors (with the clustering at the country level).

1. Using regression (1) and (2) provide an interpretation of both variables. Do coefficients differ in a substantial way? Provide an explanation.
2. Do you think you should add fixed state or time effects to your model? If so, provide appropriate examples of the effects that you want to capture.
3. Estimate regressions (3) and (4) by adding state and later time fixed effects. Do the results for the level of democracy change when you add fixed state effects? When you add time fixed effects? Why?
4. Would you reject the null that all countries have the same intercept? Show your calculations step by step.
5. Does adding control variables in regression (5) change your results? What is the coefficient on *socialism*? Explain why you obtained this result.
6. Is a pooled regression appropriate for modeling level of democracy?
7. Based on your results in Table 2 what is the relationship between countries income and democracy score? Comment on the differences between regressions (1) through (5). Does higher per capita income *cause* more democratic freedoms?