

GSERM 2023: Regression for Publishing

Homework Exercise

Overview

The data for this exercise comprises on “Article 177” references to the European Court of Justice (ECJ). Article 177 references are cases in which national judges call upon the ECJ to issue a ruling in a domestic case in which European Community law is material to the issue at hand. It is a “means for national courts to ascertain from the Court of Justice its views on the status and meaning of Community law” (Shaw 1993). Since the vast majority of these cases deal with economic and trade issues, we’ll examine the general effects of trade levels on the number of such references.

The data consist of annual observations on 15 EU nations for the period 1961-1995; missing data bring the total number of cases to 316.¹ They are available in the “Exercises” folder on the [course github repository](#), as file `GSERM-RFP-2023-ExerciseOne.csv`. The primary variable of interest is the number of Article 177 references brought to the ECJ from that nation in that particular year (*Cases*). We’ll examine the effect of three key variables on that outcome:

- *Trade* – The annual sum of imports plus exports, in billions of (constant) U.S. dollars.
- *Trade Balance* – The difference between annual imports and annual exports, in billions of (constant) U.S. dollars.
- *Centralization* – Governmental centralization, coded 1 if the state is a unitary system, and 0 if a federal/decentralized one.

You are to complete the exercises below, write up your findings in a short (400-500 word) essay, and include any relevant tables and/or figures. You should *not* add any additional variables to the data.

Part I

Begin by assuming a linear regression model that includes all three variables additively:

$$\text{Cases}_i = \beta_0 + \beta_1 \text{Trade}_i + \beta_2 \text{Trade Balance}_i + \beta_3 \text{Centralization}_i + u_i$$

For the first part of the assignment,

1. fit the regression above, and present your results (e.g., coefficients and standard errors or confidence intervals) in tabular and graphical form, following the guidelines discussed in class. Then,
2. assess the need (if any) for transformations of the variables to normality. More specifically, make decisions about whether and how to transform each of the variables in the model (both dependent and independent), discuss how you reached those decisions, and provide support for those decisions.

¹For purposes of this exercise, you should ignore the fact that these are panel / time-series cross-sectional data.

Part II

Quasi-constructivist scholars (e.g., Stone Sweet and Brunell 1998) would predict that higher overall levels of trade will increase the number of Article 177 claims. This general effect, however, could be mediated by two factors. First, the effect of overall trade levels on Article 177 references ought to be greater for states which have high negative trade imbalances (i.e., greater imports and fewer exports) than among those which have net trade surpluses. Second, one might expect that, because cases can be brought from any level of government, federal systems (with their higher number of potential “points of contact”) (a) will have absolutely higher numbers of references than will unified systems, and (b) that Article 177 references will exhibit stronger marginal associations with trade levels in federal systems than in centralized / unitary systems.

Your assignment for this part is simple: to test the above hypotheses, using OLS regression. Once you have done so, briefly discuss your findings. Be sure to interpret your results both statistically and substantively, and to include discussion(s) of the uncertainty associated with your findings.

Please submit your written homework exercise, *along with any code you used to conduct your analyses*, via email to zorn@psu.edu. (Your code may be submitted as an appendix to the PDF file, or as a separate .R file, or you may submit the entire assignment as an Rmd document.) You should submit your homework by emailing it to Dr. Zorn (zorn@psu.edu) before the due date. This assignment is worth 300 possible points (30 percent of the course evaluation total).