

### **PS699, Problem Set 6: More Hypothesis Testing**

Consider the argument that the duration of (postwar, democratic) governments is a (linear) function of two characteristics of the sitting governments: the parliamentary support of the parties in that government (i.e., their share of the total number of seats in parliament) and the number of parties in that government; that is:

Duration of Governments =  $f$ (parliamentary support, # parties in government, stochastic component)

Specifically, the argument is that duration is an increasing function of parliamentary support and a decreasing function of the number of parties in government.

A. Using the data from developed democracies in the postwar period, suggest a simple linear model (e.g., don't transform anything into logs) that you could estimate to evaluate the evidence regarding this argument.

B. Estimate this model by OLS and report on the results as they relate to the arguments. Specifically:

- 1) What have you estimated the effect on government duration of each suggested independent variable, controlling for the other, to be?<sup>1</sup>
- 2) Report on your certainty regarding this estimate in any substantively revealing manner.

C. A critic of your model (its yours, not mine, now that it has a critic) suggests that, while your general argument is correct as far as it goes, it omits a tremendously important (in critic's view) factor: party discipline. Specifically, the critic suggests that the US, Japan, France, Italy, Canada, Greece, Spain, and Portugal have low party discipline and the rest have high party discipline. "Party discipline," the windbag continues, "is really what explains government duration: more party discipline produces more durable governments and that's all there is to it."

- 1) Use the critic's own definition of high and low party discipline countries to define a nominal variable distinguishing those two groups of countries.<sup>2</sup> Add this new variable to the set of independent variables in your regression from B and re-estimate. (For future reference, add this variable to your data set and call it PD).
- 2) Report on your results as in B.
- 3) Regarding the critic's claim(s) *vis-à-vis* party discipline and government duration, what would you conclude?

D) The critic returns and says: "Wait! I didn't mean that party discipline, measured so crudely, would explain all the differences in government durations across developed democracies by itself nor really that it was a factor explaining duration like your others. I meant that the effects of other variables, parliamentary support, number of parties in government, etc., on government duration were different depending on whether the country's parties had much party discipline." Never mind that this is not what the windbag said, go ahead and:

- 1) Suggest a way to evaluate empirically the claim that the effects on government duration of parliamentary support and of the number of parties is different in PD and non-PD countries.<sup>3</sup>
- 2) Conduct that test and discuss its results.<sup>4</sup>

---

<sup>1</sup> As always, we want to state this in substantive, as well as numeric terms, *i.e.* we don't simply say "the coefficient on  $x$  is  $b$ ," we say something substantively meaningful like "*ceteris paribus*, a 1% increase in parliamentary support for government associates with an  $x$  month increase [decrease] in government duration."

<sup>2</sup> I believe this division is about right, but the groupings could easily be erroneous as a matter of actual empirical fact. I wouldn't use this division in any actual research without further exploration.

<sup>3</sup> Assume the critic means to say that the mean duration controlling for parliamentary support and for the number of parties in government would also be different in PD *versus* non-PD countries.

<sup>4</sup> There may be more than one test that could evaluate this claim; use the one involving separate estimation of the same regression equations in different samples.

E) “No, wait! Here’s what I meant to say...” [Cheeze Wiz! This guy’s annoying, eh?] “...I meant to say that we should consider your model, where government duration is a function of parliamentary support and the number of parties in government, and my model, where its a function of party discipline and whether it’s effectively a presidential system or not [where did that come from?!], as alternatives. Mine’s better.”

- 1) Suggest a way to evaluate this claim empirically.<sup>5</sup>
- 2) Conduct that test and discuss its results.

F) After thinking about the critic’s pestering and your findings, you consider the following set of propositions:

- \* government duration is a function of parliamentary support, the number of parties in government, and party discipline,
- \* the effect of parliamentary support on government duration depends upon the number of parties in government and whether parties are disciplined,
- \* the effect of the number of parties in government on government duration depends upon parliamentary support and whether parties are disciplined, and
- \* the effect of party discipline on the duration of governments depends upon the amount of parliamentary support and the number of parties in government.

- 1) Suggest a model capable of shedding empirical light on all of these propositions.
- 2) Estimate this model by OLS (print the results).

(In the following questions, “what does the evidence say about...” means “conduct a test corresponding to the statement and discuss it.”)

- 3) What does the evidence from this regression say about your (entire) first proposition?
- 4) What does the evidence say about the proposition that government duration is a function of parliamentary support? ...of the number of parties in government? ...of party discipline?
- 5) What does the evidence say about the proposition that the effect of party discipline on government duration depends on the amount of parliamentary support? ...depends on the number of parties in government?
- 6) What does the evidence say about the proposition that the effect of parliamentary support on government duration depends on the presence or absence of party discipline? ...depends on the number of parties in government?
- 7) What does the evidence say about the proposition that the effect of the number of parties in government on government duration depends on the amount of parliamentary support? ...depends on party discipline?
- 8) How many unique hypotheses are encompassed in your last three propositions?

---

<sup>5</sup> Again, there may be more than one way to do this; one way we covered is most appropriate though.