PLSC 504: "Topics in Political Methodology"

Exercise Six
October 25, 2022

Introduction and Data

The purpose of this (relatively straightforward) exercise is to estimate and interpret parametric and Cox proportional hazards models, and to compare the conclusions one might draw from them. The subject is leadership tenure; the data (available in CSV format) are drawn from the *Archigos* project, directed by Kristian Gleditsch, Hein Goemans, and Giacomo Chiozza (see here for details). They consist of time-varying data on 3,023 world leaders who served between 1875 and 2004, inclusive ($NT = 15446$), and include time-varying information on how long the leader was in office (rounded to the nearest year) and an indicator of when s/he left office.[1]

We're not going to get too complicated here; the relevant covariates are:

- the `Age` of the leader, in years,
- whether or not a leader is `Female`, which means exactly what you think it does, and
- five indicator variables for region: `LatinAmerica`, `Europe`, `Africa`, `MidEast`, and `Asia` (with North America omitted as the implicit reference category).

Assignment

1. Begin by fitting one or more parametric model(s) of leader survival, using some combination of the seven covariates provided.[2] Use your own judgement about (e.g.) if and how to specify interactions and other such things. Talk briefly about the results you obtain, being sure to include a discussion of the substantive importance of each covariate.
2. Reestimate the model in (1) using Cox's proportional hazards model. Again, use what you have learned in class and the readings to make informed, justifiable choices about what sort of model to estimate. Once again, briefly discuss your findings, this time with explicit attention to any differences between the parametric and Cox model results.

This assignment is due *electronically*, as a *PDF file*, at 11:59 p.m. EST on Tuesday, November 1, 2022, and should include both answers to each part and the code necessary to replicate your analyses. You should submit your homework by emailing copies **both** to Dr. Zorn (`zorn@psu.edu`) and to Mr. Burnham (`mike.burnham@gmail.com`). This assignment is worth 50 possible points.

[1] For now, we'll put aside the important and fascinating question of the various means by which leaders can leave office, and treat all departures as equivalent to one another.

[2] As a starting point, you can create a time-varying survival object using a command like `L.S<-with(df,Surv(TenureStart,TenureEnd,LeftOffice,type="counting"))`; some other good tips can be found here.