# Lab 2

- Due Nov 16, 2024 by 11:59pm
- Points 100
- Submitting a website url or a file upload
- Available Sep 4, 2024 at 12am - Nov 18, 2024 at 11:59pm

Lab #2 -- Temporal Processes

Choose 1 of the following options:

**Fixed/Random Effects**

1. (a) Run an OLS regression, including at least one independent variable and a time variable (as dummies). Explain how you think your independent variable relates to your dependent variable. Interpret your results. Did you find what you expected to find?

(b) Then run a fixed effect model version of that OLS model. Interpret your results. Did you find what you expected to find? Why? Why not?

(c) Then include an additional predictor in your fixed effects model that you think might account for the initial relationship you found between your X and your Y. What effect does that new independent variable have in your new regression?

(d) Then run a random effects model equivalent to your fixed effects model in step (b). Interpret the results.

(e) Run a Hausman test to compare your fixed effects and your random effects models. What do you conclude?

**SEM Models ~ SEM two-way cross-lagged model**

1- Run usual OLS models with one variable as independent variable and one as dependent variable, and vice versa. Explain what relationships you find.

2-Run an SEM two-way cross-lagged model. Explain whether either of the cross-lags are significant. Interpret your results.

3- Look at some fit measures when multiple waves are constrained to be equivalent, etc.

**Survival Analysis**

Run a multiple variable survival analysis. You can perform the survival analysis either using discrete-time methods (i.e., event history analysis) or you can use Cox proportional hazards methods, either one is fine.

(a) State what your "failure" variable is and how you expect your independent variables to affect it.

(b) Explain how you determined the #risk window" (due to right truncation and left-censoring) and who is eligible for failure over the time you are studying.

(c) Explain whether the results were consistent with your expectations, and do that by interpreting the coefficients from the models, model fit, and so on.

**Some Rubric**

| Criteria | Pts |
|---|---|
| FE/RE = Student runs an OLS regression, including at least one independent variable and a time variable (as dummies) // Survival = Student runs a multiple variable survival analysis // SEM = Student chooses two variables to be related to each other and explain why they might be reciprocally related | 10 pts |
| RE/FE = Student explains how they think their independent variable relates to your dependent variable and interprets the results. // Survival = They explain whether they are using discrete-time methods (i.e., event history analysis) or use Cox proportional hazards methods. / SEM = Student runs usual OLS models with lagged dependent variable models for each variable. | 10 pts |
| RE/FE = Student runs a fixed effect model version of that OLS model. // Survival = State what their "failure" variable is // SEM = Student interpret the OLS models | 10 pts |
| RE/FE = Student interprets the fixed effects output. // Survival = Student states how they expect their independent variables to affect it. // SEM = = Student creates an SEM model on two waves of data that allows for these variables to mutually affect each other, and explain how you made it. | 10 pts |
| RE/FE = Student then runs a random effects model equivalent to the fixed effects model. // Survival = They explain how you determined the “risk window" (due to right truncation and left-censoring) and who is eligible for failure over the time you are studying. // SEM = Student runs the SEM model. | 10 pts |
| RE/FE = Student interprets the random effects output. // Survival = Student explains whether the results were consistent with their expectations, by interpreting the coefficients from the models // SEM = Student interprets the key statistics and coeffcicients. | 10 pts |
| RE/FE = Student runs a Hausman test to compare their fixed effects and their random effects models. // Survival = Student also talks about model fit at least, if not other measures too. // SEM = Student states how the two variables look like they influence each other? | 10 pts |
| Overall, the student’s work is error-free, interesting and of high quality. | 30 pts |
| Total Points: 100 | |