Homework 2

Fernando Rios-Avila

Part 0: Modeling (10pts)

- Similar to HW1, propose a concise research project. Specify the dependent variable of interest, along with control variables.
- The model specification must include both continuous and discrete variables in your model.
- Describe your economic model and its corresponding econometric model, accompanied by a succinct description of your anticipated findings.

Part 1: Scaling, Interactions, and Qualitative Information

- Estimate your baseline model, and provide a summary statistics table to facilitate interpretation.
- Are there any variables in your models that might require adjustments in scaling to enhance interpretation? Explain.
- Reevaluate your model by standardizing all variables, including the dependent variable, and then re-estimate the model.
- Validate your results using the `beta` option in the `regress` command.
- Are there any supplementary insights derived from this model, compared to the unscaled model?
- Interpret your outcomes.
- Introduce an interaction between one of your continuous variables and one of your discrete variables. Subsequently, provide an interpretation of the outcomes. Are the slopes across different groups different? Can you provide reasoning for potential differences?
- Do you suspect the existence of a mutual influence between any two variables in your model? (interactions)

  - Re-estimate the model and interpret the results. How do the average marginal effects compare to your baseline model? What can be inferred about the interaction?

Part 2: Heteroskedasticity

- Based on your preferred model specification, discuss on whether your model could potentially exhibit heteroskedasticity.
- Investigate any signs of heteroskedasticity within your model. Present a graph and a statistical test to support your evaluation.
- Re-estimate your model using robust standard errors and Weighted Least Squares, even if no heteroskedasticity is found.
- Interpret your findings. How do they contrast with the baseline model?

Part 3: Other Model Diagnostics

- With reference to your baseline model specification, discuss the likelihood of your model suffering from misspecification.
- Test your hypothesis by providing supporting tests to validate your assessment.
- In case of model misspecification, re-estimate your model using a different functional form.
- Provide an interpretation of the outcomes, comparing them against the baseline model.
- One potential problem with linear regressions is their susceptibility to outliers. Use quantile regression to estimate the model and interpret the results. Do you believe this suggests the presence of outlier-related issues in your data?

Part 4:

- Write a conclusion concerning your research question and your findings.

Note

Explore all datasets available in `frause` and utilize the data from these datasets to determine the variables for analysis and the controls to incorporate into your homework.

The examples within the textbook can serve as valuable guidelines for your considerations here.

You have the freedom to explore other sources. If you do so, please include the data alongside your homework submission.

Exceptionally unique responses (distinguished by their thoroughness, detail, innovation, and presentation) may merit extra points.