Vanderbilt University
Leadership, Policy and Organizations
Class Number 9522
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Assignment 4

Prediction is central to the interpretation of regression results. In this exercise, you'll be asked to conduct a cost benefit analysis of changing the student-teacher ratio in California using both prediction and forecasting.

1. Using the California schools dataset, estimate a model that identifies the predicted impact of an additional student per teacher, controlling for expenditures per student, cal works percent, and free/reduced meal percent on test scores. Create a graphic that shows the predicted impact of increasing the number of students per teacher over its range with uncertainty around the prediction.
2. Assume that a policy has been suggested that will lower class sizes by 5 students per teacher. Holding all another values at a reasonable level, predict the impact of this increase on student test scores at the district level, with an appropriate statement of uncertainty. Remember that what you'll need to be doing here is forecasting. Assume that you'll be going from the current value to 5 students lower.
3. The legislature is now debating a range of policies, from an decrease of 5 students to a decrease of 10 students per teacher. Predict the impact of an increase from the minimum suggested level to the maximum suggested level, again with an appropriate statement of uncertainty. Plot the result in a manner appropriate for presentation to an interested lay audience.
4. In a separate document, comment on the coefficients estimated in the model, including their direction and significance. Report the results of your predictions, interpreting them for an interested policy audience. Then describe the uncertainty around your forecast of increasing from the current ratio to the lower level. Make sure to include a graphic for your state legislator.