PA 9950 Quantitative Methods

Problem Set #3

This homework is to accompany program #3.

Answer all questions fully, please be sure to turn in a log file with your assignment. You should write up your results as though you are providing a reply to a reviewer.

Notes for re-scaling variables: 1 acre = 43,560 square feet, 1 mile = 5,280 feet

Part I

1. Estimate two separate models for the log(real home price) - see do file. Interpret the continuous coefficient on baths and the binomial coefficients for baths. Be sure to discuss how the effects compare.
2. Calculate the marginal effect of having another bathroom in the house for both models. Compare.
3. Compare the adjusted R-squares for these two models. What are the implications for choosing a preferred specification?
4. Discuss the hypothesis that all the parameter estimates are jointly equal to zero.

Part II

1. Create an interaction effect between house age and central bus district. Interpret this effect and its significance.
2. Re-specify your ***preferred*** regression specification to test the effect of living near an incinerator on housing prices. Interpret your findings and justify your preferred specification. Are there joint hypotheses that should be tested?

Part III

1. Carefully discuss each of the Gauss-Markov assumptions in the context of your model.
2. Discuss the level of significance for both the distance and log(distance) variables. Here I assume that you ran both variables SEPARATELY in your quest for a preferred regression specification. If not, do so now. Is the difference in the significance driven by the change in the standard error or the size of the coefficient? Prove your assertion.
3. Calculate by hand Breusch-Pagan F-test using your preferred model. What is the result of this test? How should you proceed?

Part IV

1. Re-estimate the equation, add as explanatory variables *male*, *married*, and a full set of industry and injury type dummy variables. How does the estimate of *afchng\*highearn* change when these other factors are controlled for? Is the estimate still statistically significant?
2. What do you make of the small R-squared from part (a)? Does this mean the equation is useless?
3. Estimate the original equation using the data for Michigan. Compare the estimates on the interaction term for Michigan and Kentucky. Is the Michigan state statistically significant? What do you make of this?