BIOS 645 Homework

1. I regressed the marital measure of fertility onto the variables agriculture, examination, education, catholic, and infant mortality, with the interaction between education and the proportion of the population that is Catholic. I calculated the effect of education at low and high levels of the variable Catholic.

Table

Description automatically generated

Table

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Chart, scatter chart

Description automatically generatedChart, scatter chart

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1. I fit one model regressing fertility on all the variables except education. The residual plot seems skewed left, and the qq-plot does not completely follow a 45-degree line, but the residuals vs predicted values look okay.

Table

Description automatically generatedChart

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The only data that was significant were the examination variable (β=-0.97, SE=0.25, p<0.0004) and infant mortality (β=1.40, SE=0.46, p<0.0043).

I also fit one model regressing fertility on all the variables, including education. The residual plot is fairly normal, and the qq-plot mostly follows a 45-degree line. The residual vs predicted value plot is relatively homoscedastic.

Table

Description automatically generatedDiagram

Description automatically generated with medium confidence

More data was significant in this model. The agriculture variable (β=-0.17, SE=0.07, p<0.1087), education (β=-0.87, SE=0.18, p<0.0001), Catholic (β=0.10, SE=0.04, p<0.0052), and infant mortality (β=1.08, SE=0.38, p<0.0073) were all significant.