

**Economics 471: Econometrics**  
Department of Economics, Finance and Legal Studies  
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Problem Set #8

1. Using CEOSAL2.RAW, we can estimate the following equation

$$\ln(\widehat{salary}) = 4.57 + 0.188 \ln(sales) + 0.100 \ln(mktval) - 0.0022 profmarg + 0.0171 ceoten - 0.0092 comten$$

where *salary* is the CEO's salary, *mktval* is market value of the firm, *profmarg* is profit as a percentage of sales, *ceoten* is years as CEO with current company, and *comten* is total years with the company.

- (a) Replicate the results and obtain the  $R^2$ .
  - (b) Add the variables  $ceoten^2$  and  $comten^2$  into the model. Is there evidence of functional form misspecification in this model?
2. Using the data in CEOSAL1.RAW, consider the equation

$$\ln(salary) = \alpha + \beta_1 \ln(sales) + \beta_2 roe + \beta_3 rosneg + u$$

where *salary* and *sales* are described above and *roe* is the rate of return on equity and *rosneg* is a dummy which equals one if *ros* is positive and 0 otherwise, where *ros* is the return of the firm's stock.

- (a) Estimate the model.
- (b) Discuss the interpretation and statistical significance of  $\widehat{\beta}_3$ .
- (c) Apply the RESET test

$$\ln(salary) = \alpha + \beta_1 \ln(sales) + \beta_2 roe + \beta_3 rosneg + \beta_4 \ln(\widehat{salary})^2 + \beta_5 \ln(\widehat{salary})^3 + v$$

Is there evidence of functional form misspecification in the equation?

- (d) Compute a heteroskedasticity-robust form of RESET. Does your conclusion from part (c) change?