

Economics 471: Econometrics

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Problem Set #8 – Answers

1. (a) $\ln(\widehat{salary}) = 4.57 + 0.188 \ln(sales) + 0.100 \ln(mktval) - 0.0022profm \arg + 0.0171ceoten - 0.0092comten$
- (b) There is functional form misspecification if either of the two additional variables are significant. Therefore, we test the joint significance of these variables using the R^2 form of the F test: $F = \left[\frac{(0.375 - 0.353)}{1 - 0.375} \right] \left[\frac{(177 - 8)}{2} \right] = 2.97$. With 2 and ∞ df, the 10% critical value is 2.30 while the 5% critical value is 3.00. Thus, the p-value is slightly above .05, which is reasonable evidence of functional form misspecification.
2. (a) $\ln(\widehat{salary}) = 4.30 + 0.288 \ln(sales) + 0.0167roe + 0.226rosneg$
- (b) The coefficient on *rosneg* implies that if the CEO's firm had a negative return on its stock over the 1988 to 1990 period, the CEO salary was predicted to be about 22.6% lower, for given levels of *sales* and *roe*. The t statistic is about -2.07, which is significant at the 5% level against a two-sided alternative.
- (c) To obtain the RESET F statistic, we estimate the model and obtain the fitted values. To use the version of RESET described in the question, we add the squared and cubed fitted values and obtain the F test for joint significance of these variables. With 2 and 203 df, the F statistic is about 1.33 and p-value .27, which means that there is not much concern about functional form misspecification.
- (d) Interestingly, the heteroskedasticity-robust F-type statistic is about 2.24 with p-value .11, so there is stronger evidence of some functional form misspecification with the robust test. But it is probably not strong enough to worry about.