Public Affairs 818
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Final Exam Review Sheet

Chapters 14 and 15 - Regression

- Understand the least squares criteria – the criteria with which we arrive at least squares estimates.
- Understand the properties of least squares estimates (the line goes through the means) and

$$\sum_i x_{ji} \cdot e_i = 0 \ \forall_j$$

- Understand R-squared - know the formula and be explain and describe what information in conveys.
- Know and understand the assumptions of ordinary least squares (OLS).
- Know how to read and interpret STATA style regression output.
- Know how to compute t-values (for different hypothesis test) and confidence intervals given coefficient estimates and estimates of the standard errors of the coefficient estimates (i.e. the first two columns of the STATA regression table output).
- Know how to interpret regression coefficients in three cases.
    1. When the dependent variable is in log form.
        a. When the independent variable is measured in levels or is a dummy variable - In this case the coefficients are estimates of the fractional change in the un-logged dependent variable brought about by a unit change in the independent variable, holding everything else constant (All our human capital models were estimated in this form)
        b. When the independent variable is the natural log of a semi-continuous variable – In this case the coefficients are estimates of the elasticity of the un-logged dependent variable with respect to the un-logged independent variable. (Nerlove's model was estimated in this form)
    2. When the dependent variable is in levels and when the independent variable is measured in levels or is a dummy variable – In this case the coefficients are estimates of the change in the dependent variable brought about by a unit change in the independent variable.
- Know the connection between the standard normal, Chi-squared, and F-distributions.
- Know how to test a set of linear restrictions using the generalized F-test. You will need to remember the formula

$$F = \frac{\left(\frac{SSE^{*} - SSE}{r}\right)}{\left(\frac{SSE}{n-(k+1)}\right)} = \frac{\left(\frac{R^{2} - R^{*2}}{r}\right)}{\left(\frac{1-R^{2}}{n-(k+1)}\right)}$$