POLS/CS&SS 503:
Advanced Quantitative Political Methodology

RESIDUALS IN OLS: NON-NORMALITY, HETEROSKEDASTICITY

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Jeffrey B. Arnold

UNIVERSITY *of* WASHINGTON
DEPARTMENT OF POLITICAL SCIENCE

CENTER *for* STATISTICS
and the SOCIAL SCIENCES

Overview

Non-normal errors

Suppose that errors ϵ have $E(\epsilon) = 0$, but not normal distribution

- $\boldsymbol{b}$ still unbiased
- $V(\boldsymbol{b})$ incorrect in small samples
- Still BLUE, but not MVUE

How to diagnose non-normal errors?

Graphical methods

- Plot studentized residuals against theoretical t-quantiles.
    - Studentized residuals (approximately standardized to have std dev of 1)

$$E_i^* \approx \frac{E_i}{S_E}$$

- Density plot
- Box-plot

SLID

- Example in Fox
- Survey of Labour Income and Dynamics (Canada)
- 3,997 employed individuals between 16–65 residing in Ontario