12 November

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Homoskedasticity

$Var(\varepsilon_j) = \sigma^2$ → variance of error term is constant

Heteroskedasticity?

1) when value of independent variable increases

$ spent on vacation = $\beta_0 + \beta_1$(income)

low inc → spend less, less variation
high inc → spen more, more variation

2) measurement errors
3) sub-population differences or other interaction effects
4) model misspecifications

Consequences

1) Do not provide estimates w/ smallest variance
2) standard errors will be biased

How to detect Heteraskedasticity?

Plot residuals vs fitted values

↳ If uniform across zero, homoskedasticity is satisfied

rvf plot in STATA → residuals vs independent var

rvp plot in STATA → residuals vs X var

White's Test → test null that there is homoskedasticity
H_a: heteroskedasticity

$p > .05$ → fail to reject H_0

Stata → regress y x
estat imtest, white

How to fix heteroskedasticity

1) improper model specification
- check for left out variables
- transfer variables
2) use robust standard errors
regress y x, robust
3) use weighted linear regression

Use log when dependent var can't be negative