ECON6300/7320/8300
Advanced Microeconometrics
Quantile Regression

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Practical 8
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Introduction

- This class will review:
  - Plotting quantile functions
  - Quantile regression
  - Bootstrap standard errors
  - Simultaneous quantile regression and hypothesis tests
  - Plots of quantile coefficients
- We begin with a demonstration following Microeconometrics using STATA chapter 7.
- We move on to a practical based on estimating Engel curves for medical expenditure in Vietnam.

Practical (1)

- We have data from the World Bank's 1997 Vietnam Living Standards Survey for 5,006 households with positive medical expenditures in the previous year. The data are qreg0902.dta.
- The variables are age and gender of household head, whether the household is a farm, whether it is urban, the household size, log total household expenditure and log household expenditure on medicine.
- We are interested in estimating Engel curves for medical expenditure
- The outcome of interest is log household expenditure on medicine, the covariate of interest is log total household expenditure and the remaining variables are controls.

Practical (2)

1. Load the data, summarize and describe
2. Plot the quantiles of the outcome of interest (log household expenditure on medicine)
3. Estimate the quantile regression at the median and compute the average marginal effect of age on total medical expenditure (not log total medical expenditure)
4. Compare the OLS estimates of the coefficient on log total expenditure with the quantile estimates $q = 0.1, 0.5, 0.9$. Is there evidence of heterogeneity at different quantiles?
5. Are your findings consistent with heteroskedasticity in the standard linear regression model (OLS)? Perform a test of heteroskedasticity to verify this.
6. Test equality of the coefficient on log total expenditure at quantiles 0.1,0.5,0.9 (i.e. $H_0 : \beta_{.1} = \beta_{.5} = \beta_{.9}$)
7. Plot the quantile regression coefficients against the quantiles. Include confidence intervals for the quantile regression coefficients. Include the OLS coefficient and confidence interval for comparison.