University of Lisbon ISEG
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Advanced Topics in Econometrics
(PhD in Mathematics Applied to Economics and Management)
2025/2026
Exercise Sheet 8 - Nonparametric estimation
(version 13/9/2025)

The file `vietnam.xlsx` (available in fenix), contains data from the World Bank 1997 Vietnam Living Standards Survey[1].

1. The variable `lhhexp1` represents the log of the household total expenditure. Obtain a non-parametric estimate of the density of `lhhexp1`. Compare the bandwidth used by STATA with the one suggested by Silverman's rule-of-thumb.

2. Repeat the nonparametric estimation of the density of `lhhexp1`, but now use different kernels and bandwidths. Are the results surprising?

3. Obtain the Nadaraya-Watson estimator of the conditional expectation of `lnrlfood`, the log household expenditure on food, given `lhhexp1`. Does the result suggest that this conditional expectation is linear?

4. Using OLS, estimate a regression of `lnrlfood` on `lhhexp1`, `age` and its square. Is the effect of age linear?

5. Use the partially linear estimator to estimate in the following model

$$\texttt{lnrlfood}_i = \beta \texttt{lhhexp1}_i + g(\texttt{age}_i) + u_i.$$

6. Compare the result with that obtained in part 4.

[1] This data set is used by Cameron, A.C. and Trivedi, P.K. (2005). "Microeconometrics: Methods and Applications", Cambridge University Press. The data are available here: http://cameron.econ.ucdavis.edu/mmabook/mmadata.html.