



TU-Berlin

Microeconometrics

2nd Tutorial: Estimation Techniques (Introduction)

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Do you recall?

- ▶ What do we need any estimation techniques for?
- ▶ What is the non-parametric regression? (i.e. Why it is called non-parametric?)

Nadaraya-Watson

- Explain the following formula!

$$\hat{m}_h(x) = \sum_{i=1}^n \frac{K\left(\frac{x-X_i}{h}\right)}{\sum_{j=1}^n K\left(\frac{x-X_j}{h}\right)} y_i = \sum_{i=1}^n W_{h,i} y_i$$

- What is the role of h ?
- What does $\hat{m}_h(x)$ estimate?

Estimation

- ▶ Read the `mroz.dta` into R (using foreign-package)
 - ▶ Look into R-script for more details
- ▶ Try to plot the relationship between `inlfl` (=1 if the spouse is active in the labour market) and `faminc` (income of the family) using Nadaraya-Watson estimator
 - ▶ Try different Bandwidths and contemplate on the role of the bandwidth in the estimation

Interpretation

- 1 What can you learn from the graph? I.e. How can you interpret the individual "points"?
- 2 Summarize, what is the role of the kernel?
- 3 What changes with changing bandwidth?
- 4 Are there any downsides to non-parametric estimation?

In case we want to include multiple variables

- ▶ We could use Linear Probability Model.
 1. Write down the Model you are estimating with LPM
 2. Estimate it using `lm()` in R!

Interpretation

- ▶ Interpret the value of the regression line at some (arbitrary) point $X=x_i$
- ▶ Can you learn something from the estimated coefficients? (Compare it to the non-parametric case).
 1. Choose one coefficient and interpret it properly!
 2. Can you decipher any assumption linked to the interpretation? (If so, is this assumption sensible in this case?)
 - ▶ Can we make it more flexible?
- ▶ Are there any downsides to this estimation strategy?