Forecasting

Aggregation

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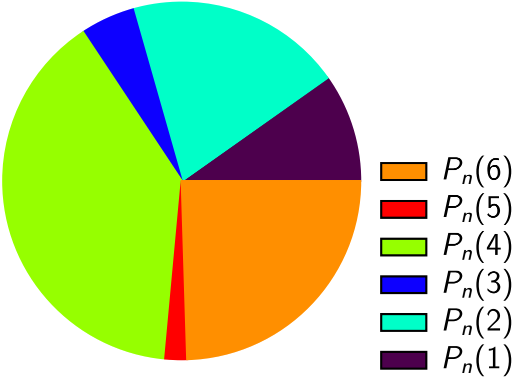
Introduction to choice models

ÉCOLE POLYTECHNIQUE
FÉDÉRALE DE LAUSANNE

Microsimulation

Microsimulation



Microsimulation

Simulated choice

- For each observation, draw R times from the choice model.
- Define $\widehat{y}_{inr} = 1$ if alternative i has been generated by draw r, 0 otherwise.
- Approximation:

$$P_n(i|x_n;\theta) \approx \frac{1}{R}\sum_{i=1}^{R} \widehat{y}_{inr}.$$

Warning

It is invalid to select the alternative with the highest probability.

Aggregate market shares

Number of individuals choosing alternative i

$$N(i) = \frac{1}{R} \sum_{n=1}^{N} \sum_{i=1}^{R} \widehat{y}_{inr}.$$

Share of the population choosing alternative i

$$N(i) = \frac{1}{N} \frac{1}{R} \sum_{n=1}^{N} \sum_{i=1}^{R} \widehat{y}_{inr}.$$

Microsimulation

For each r

Population	Alternatives				Total
	1	2	$\cdots$	J	
1	$\widehat{y}_{11r}$	$\widehat{y}_{21r}$	$\cdots$	$\widehat{y}_{J1r}$	1
2	$\widehat{y}_{12r}$	$\widehat{y}_{22r}$	$\cdots$	$\widehat{y}_{J2r}$	1
$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$
N	$\widehat{y}_{1Nr}$	$\widehat{y}_{2Nr}$	$\cdots$	$\widehat{y}_{JNr}$	1
Total	$N(1)$	$N(2)$	$\cdots$	$N(J)$	N

Microsimulation

In practice

Population	Draw			
	1	2	$\cdots$	R
1	i_{11}	i_{12}	$\cdots$	i_{1R}
2	i_{21}	i_{22}	$\cdots$	i_{2R}
$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$
N	i_{N1}	i_{N2}	$\cdots$	i_{NR}