Forecasting

Aggregation

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Introduction to choice models

Aggregation

Motivation

- Prediction about a single individual is of little use in practice.
- Need for indicators about aggregate demand.
- Typical application: aggregate market shares.

Aggregation

- Disaggregate model:

$$P_n(i|x_n;\theta)$$

- Obtain x_n for each individual n in the population.
- Question: why is $\mathcal{C}_n$ omitted?

Aggregate market shares

Number of individuals choosing alternative i

$$N_T(i) = \sum_{n=1}^{N_T} P_n(i|x_n;\theta).$$

Share of the population choosing alternative i

$$W(i) = \frac{1}{N_T}\sum_{n=1}^{N_T} P(i|x_n;\theta) = \mathrm{E}\left[P(i|x_n;\theta)\right].$$

Aggregation

Population	Alternatives				Total
	1	2	$\cdots$	J	
1	$P(1\|x_1;\theta)$	$P(2\|x_1;\theta)$	$\cdots$	$P(J\|x_1;\theta)$	1
2	$P(1\|x_2;\theta)$	$P(2\|x_2;\theta)$	$\cdots$	$P(J\|x_2;\theta)$	1
$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$
N	$P(1\|x_N;\theta)$	$P(2\|x_N;\theta)$	$\cdots$	$P(J\|x_N;\theta)$	1
Total	$N(1)$	$N(2)$	$\cdots$	$N(J)$	N

Large table

When the table has too many rows...

apply sample enumeration.

When the table has too many columns...

apply micro simulation.