

Past Spanish experiences in replication methods

- **LFS: BRR Balanced Repeated replications**
- **Jackknife: ICT in Households (Caljack: Lavallée)**

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EU-SILC Methodological Workshop

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The Spanish experience of variance estimation in wave 1 of EU-SILC

Alejandro Salinero
INE- SPAIN



Bootstrap paradigm

- Given the sample
- Obtain B resamples with replacement
- $\hat{\theta}_b^*$ represents the estimate with the b resample
- * The estimated variance is

$$\hat{V}_{BOOT}(\hat{\theta}) = \frac{1}{B-1} \cdot \sum_{b=1}^B (\hat{\theta}_b^* - \hat{\theta}_*^*)^2$$

$$\hat{\theta}_*^* = B^{-1} \cdot \sum_{b=1}^B \hat{\theta}_b^* \quad \text{Is the bootstrap mean}$$

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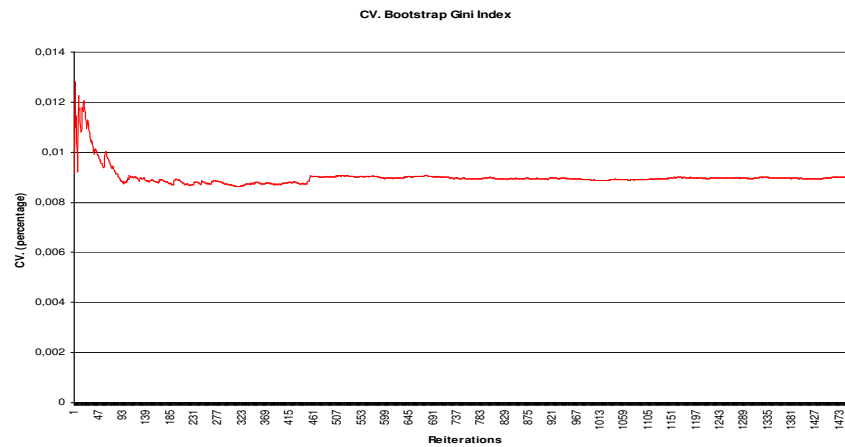
Sample Design of the Spanish EU-SILC

- **Common Eurostat Framework**
- **Two stage stratified sample**
- **PSU Censal Sections**
- **SSU Dwellings**
- **Continuous Population Register**

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Results II

Coefficient		BOOT	LIN-POULPE
Gini	30,7	0,882	0,95



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Some problems in Survey sampling

- Replicate the method can be difficult
- Large population and samples within strata: with or without replacement
- Two stage resamples
- Calibration of the resamples : ill-conditioned matrices
- Use of the weights
- Heavily computer intensive

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Results I

INDICATOR	EU-SILC 2004			Actual Sample	BOOT-POULPE	
	VAR	CV_BOOT (%)	CV_POULPE (%)			
At-risk-of-poverty rate (after social transfer) by age and gender						
Total	0 le age	19,9	1,796	1,9	42107	-0,104
	16 le age le 24	19,1	4,225	4,1	4825	0,125
	25 le age le 49	15,6	2,593	2,5	15574	0,093
	50 le age le 64	16,6	3,703	4,1	7282	-0,397
	65 le age	29,6	2,604	2,8	7374	-0,196
	16 le age	19,1	1,854	1,9	35055	-0,046
	16 le age le 64	16,5	2,314	2,2	27681	0,114
	0 le age le 64	17,9	2,195	2,3	34631	-0,105
Men	0 le age	19	2,077	2,2	20443	-0,123
	16 le age le 24	17,8	5,790	5,4	2470	0,390
	25 le age le 49	14,9	3,061	2,8	7678	0,261
	50 le age le 64	16,3	4,318	4,7	3494	-0,382
	65 le age	26,7	3,382	3,7	3185	-0,318
	16 le age	17,7	2,206	2,1	16827	0,106
	16 le age le 64	15,7	2,631	2,5	13642	0,131
	0 le age le 64	17,6	2,410	2,6	17200	-0,190
Women	0 le age	20,8	1,900	2	21664	-0,100
	16 le age le 24	20,5	5,070	5,1	2355	-0,030
	25 le age le 49	16,4	2,773	2,7	7896	0,073
	50 le age le 64	16,8	4,162	4,6	3788	-0,438
	65 le age	31,8	2,685	2,8	4189	-0,115
	16 le age	20,5	1,898	2	18228	-0,102
	16 le age le 64	17,2	2,451	2,5	14039	-0,049
	0 le age le 64	18,2	2,407	2,5	17431	-0,093

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