

Income and wealth sample estimates
consistent with macro aggregates: some
experiments
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Overview

- ▶ Survey of Household Income and Wealth (SHIW) conducted every two years by the Bank of Italy
- ▶ Like all surveys; there is measurement error
 - ▶ Under-reporting, non reporting
 - ▶ Purpose of the study is to evaluate methods for compensating for these response errors to see if this decreases the measurement error
 - ▶ If then discusses the extent to which these data can be used for micro-simulation

Methods

- ▶ Design-based approach ; two phase process
 - ▶ Sample selected is phase 1
 - ▶ Respondents from sample is second phase
 - ▶ Model-assisted approach (calibration for first phase or model-based for the second phase ?)
- ▶ Model-based approach : imputation
 - ▶ Can allow models for each variable
 - ▶ Can provide more consistency
 - ▶ Can modify correlations
- ▶ Examine their joint use for the SHIW

Previous work

- ▶ Comparisons between SHIW and macro estimates done for decades
 - ▶ More under reporting of wealth (certain assets) than income or savings (1970's)
 - ▶ Studied using sample matching (900 persons) where wealth was known : 30% non-response
 - ▶ Average of nonfinancial assets slightly higher than respondents;
 - ▶ average value of securities declared is 15% lower ; mostly denied ownership of that asset
 - ▶ Response error highest with higher wealth
- ▶ Panel attrition study (1992)
 - ▶ Under-reporting of income due to attrition was estimated at 5 percent
- ▶ Para-data analysis (2002)
 - ▶ Based on number of call attempts
 - ▶ Adjust by the probability of responding increased income and wealth estimates
 - ▶ Response after a refusal had income 20% to 30% higher
 - ▶ Not at home the first time had a few points below average

Previous work

- ▶ Households with bank information (1990, 2002)
 - ▶ Non-response not missing at random; higher among wealthiest
 - ▶ bias larger for financial assets than for income
 - ▶ average of nonfinancial assets slightly higher than respondents;
 - ▶ average value of securities declared is 15% lower ; mostly denied ownership of that asset
 - ▶ Response error highest with higher wealth
 - ▶ Under-reporting more important than non-reporting
 - ▶ Non-reporting more prevalent among low income, lower education
 - ▶ Adjustments improve but still different from the accounts
- ▶ Study of non-respondents to SHIW (2011, 2014)
 - ▶ Higher attrition among wealthiest
 - ▶ Under reporting of vacation homes ...
 - ▶ ...

SHIW Survey design

Households selected from municipal civic registers may have some under-coverage (i.e. recent immigrants)

Non-response may be a more important issue : households non-respondents are replaced by other households randomly selected within the municipality

this controls for the potential source of bias due to the relation between the local and households characteristics ?

post-stratification at the person level (raking of age, sex, geographical area and size of municipality)

Assume differences are due in part to non-response but mainly to under-reporting

Panel households ? Non-panel households, sample sizes ?

Adjusting for non-response and under-reporting

1. Proportionnal adjustment (C1) : under-reporting is constant (ratio of a known total and sample total)
for under-reporting only

2. Adjustment based on interviewer score (C2) : interviewer provides a score on their judgement of the reliability of the respondent's answers

two methods

logistic model

ratio

for under-reporting only

Adjusting for non-response and under-reporting

3. The adjustment of single phenomena (C3) :

C3A : non-response adjustment based on probability of responding
different models for panel and non-panel households

C3B : adjustment of self-employment income

assume no under-reporting for a group (employees)

assume an income related variable not affected by measurement error (value of the primary residence due to the presence of an interviewer)

use that variable to estimate income indirectly

C3C : adjustment of real estate other than primary residence - C3C

compare the estimates from the survey with Census, survey from tenants; assume that all primary residences are reported and that under reporting is on secondary residences (approximately 65% under reporting)

impute properties to the most likely owners

C3D : adjustment of financial assets

only 30% to 40% of aggregates

compared SHIW with a survey from banks clients that was stratified by brackets of financial wealth, geographical area, size of municipality of residence); post stratify the sample to match population

statistical matching ? or record linkage to estimate under reporting for the matched records; apply to the whole sample

Adjusting for non-response and under-reporting

4. Calibration (C4-C9)

Calibrate to household socio-demographic controls + total income by source or type of wealth

Income : employment, pensions and transfers, self-employment and capital

Total wealth increased variability of the weights

Adding wealth categories converged only for some years, added even more variability to the weights and depending on the controls added, sometimes did not converge at all

Better when limit the control and do it after non-response adjustment (C3)

Results

- ▶ Show average income and net worth by household characteristics; original values with survey, as well as with various adjustments
- ▶ C1 ; greater impact for self-employed income, net worth in the north
- ▶ C2; similar to C1
- ▶ C3 ; increases income 19%, 38% in wealth compared to the SNA
- ▶ C4 ; increases income 30% and 23 % in wealth
- ▶ C5 ; instable for income

Figure 1 – Profiles of household income: comparison among corrections

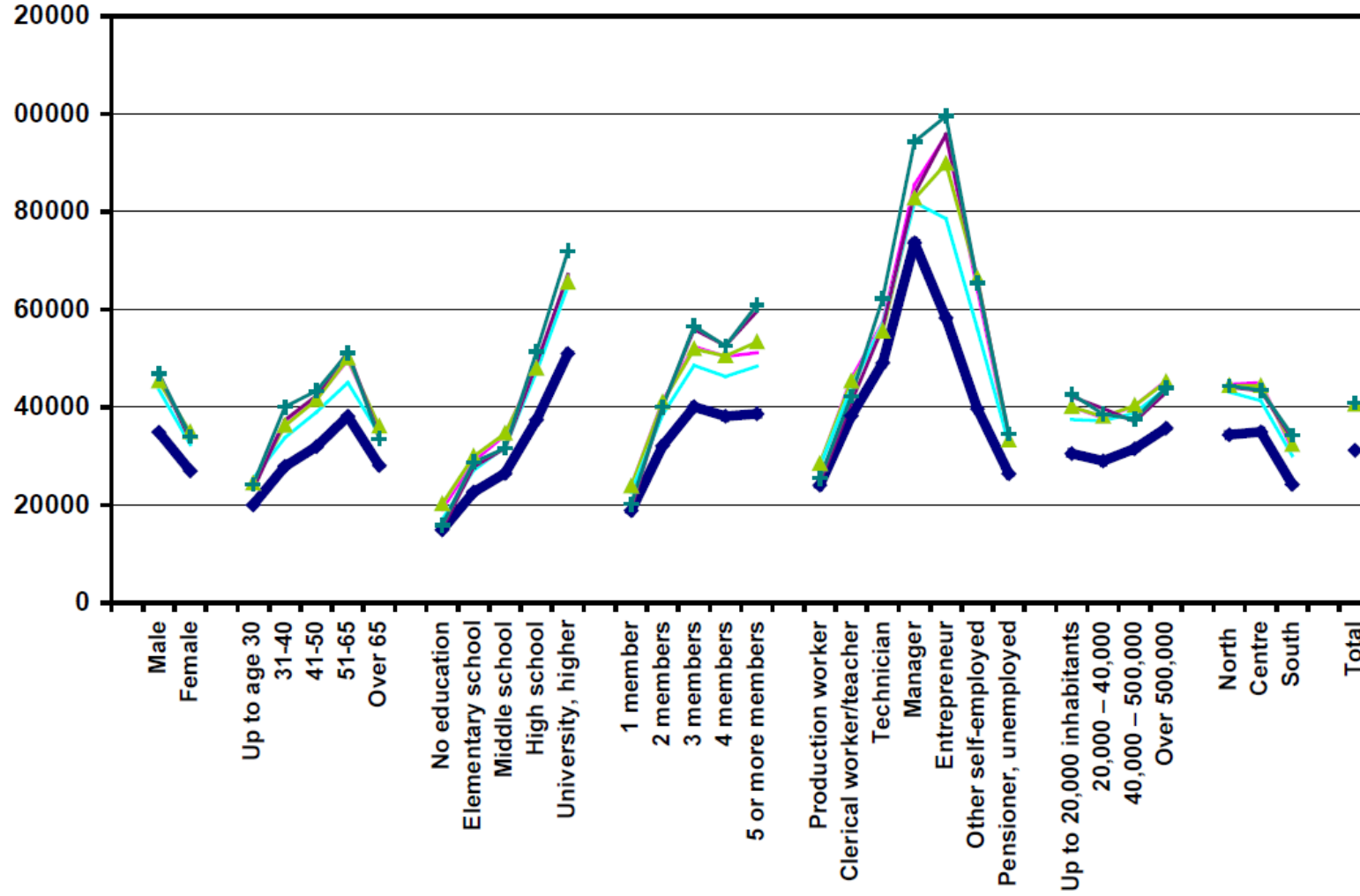
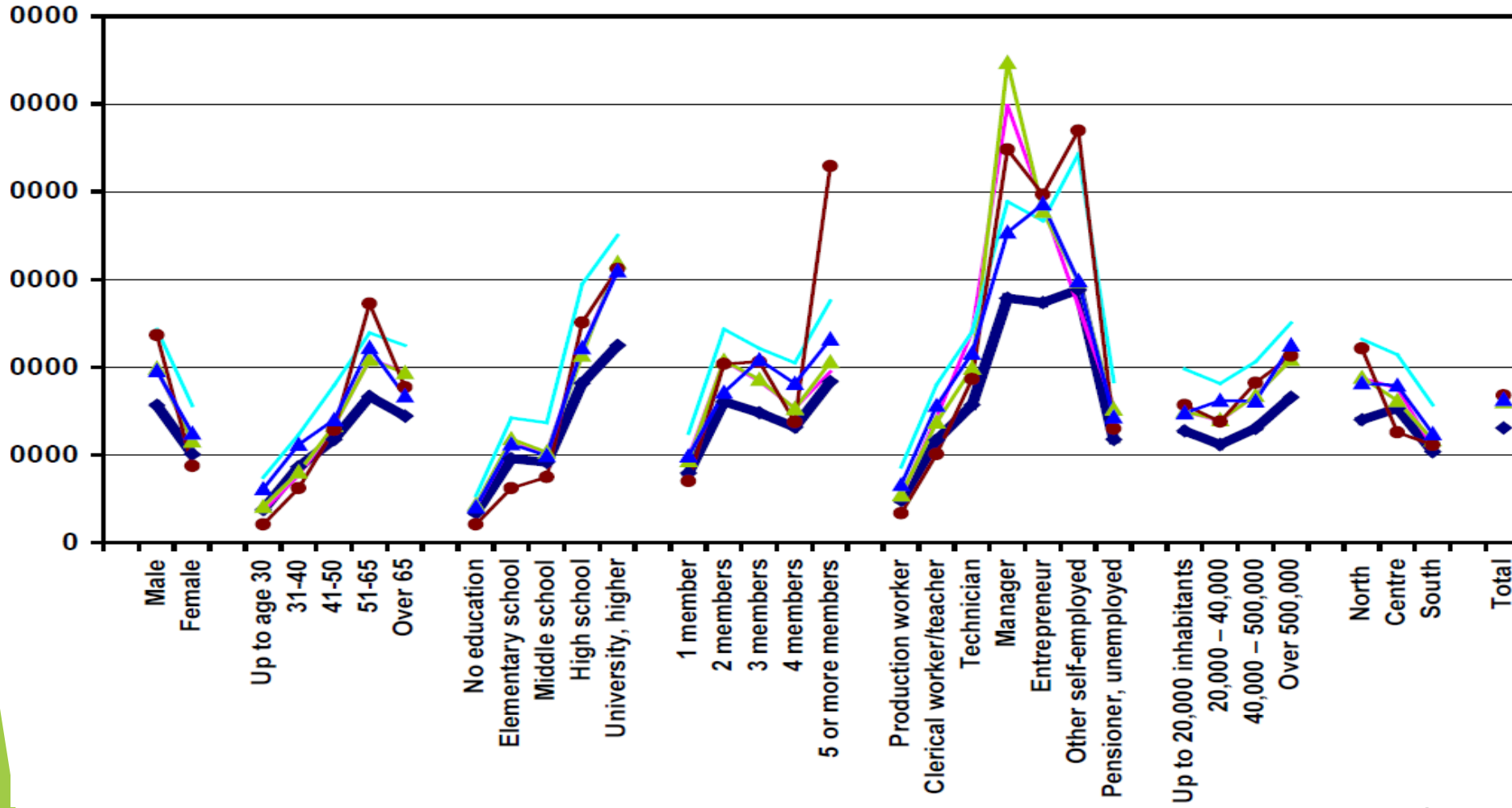


Figure 2 – Profiles of household net wealth: comparison among corrections



Adjustments increase number of houses reported

Table 6

**Distribution of number of houses in addition to primary residence
in fiscal data and in SHIW original and adjusted data**

	Houses other than primary residence							Total
	0	1	2	3	4	5	6 and more	
Fiscal data	68.2	23.0	6.8	0.5	0.5	0.4	0.6	100.0
C ₀	85.0	11.7	2.3	0.6	0.2	0.1	0.0	100.0
C ₃	66.0	22.9	7.0	2.7	0.8	0.4	0.1	100.0
C ₄	87.7	9.5	2.0	0.4	0.2	0.0	0.1	100.0
C ₅	82.5	12.6	3.3	0.9	0.6	0.1	0.0	100.0
C ₆	72.3	18.9	6.0	2.1	0.3	0.4	0.1	100.0
C ₇	68.4	21.5	6.5	2.4	0.6	0.5	0.0	100.0
C ₈	73.8	17.9	5.6	1.9	0.3	0.4	0.1	100.0
C ₉	90.9	7.2	1.4	0.3	0.1	0.0	0.1	100.0

Conclusions

- ▶ Underestimation of income and wealth in SHIW and compared different methods to compensate for non-sampling errors
- ▶ Corrections based on specific knowledge of the phenomena are costly, require many assumptions and do not always perfectly fit
- ▶ One adjustment is hard to conceive ; adjusting for various income components may impact components of wealth and vice-versa
- ▶ Adjustments do not seem to impact demographic distribution too much
- ▶ Calibration based seem to be promising

Questions for the authors

- ▶ Liked the paper - interesting sets of adjustments and adjustments seem to make improvements
- ▶ Put legends on the graph
- ▶ Would have liked to see a full set of reconciliation with the SNA
 - ▶ Are the SNA always correct ? Are there conceptual differences ?
- ▶ Would have like more details on the design:
 - ▶ sample sizes of panel and non-panel
 - ▶ What is the AIBP sample ?
- ▶ Can the design be improved ?
 - ▶ High income ?

Concordance of Wealth Variables

	SFS 2012	NBSA 2012Q3	Coverage (SFS/NBSA)
Total Assets	9,367,532	9,327,235	100.4%
Total Financial Assets	4,666,076	4,778,249	97.7%
Life Insurance & Pensions	1,871,134	1,878,059	99.6%
Other Financial Assets	2,794,942	2,900,190	96.4%
Total Non-Financial Assets	4,701,456	4,548,986	103.4%
Real Estate	4,186,037	3,979,854	105.2%
Other Non-Financial Assets	515,418	569,132	90.6%
Total Debt	1,337,071	1,688,432	79.2%
Mortgage Debt	1,029,811	1,062,623	96.9%
Other Debt	307,261	625,809	49.1%
Net Worth	8,030,461	7,638,803	105.1%