

# The under-reporting of households' financial assets in Italy

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## 1. Introduction

The main sources of information about Italian households' financial wealth are the quarterly National Financial Accounts (NFA) and the biannual Survey on Household Income and Wealth (SHIW), both produced by the Bank of Italy. The two sources are independent, and differ in that the first is aggregate, whereas the second is based on micro data collected from a representative sample of Italian households. As a result, they do not provide consistent information, even accounting for differences in definitions and evaluation criteria (Bonci et al., 2004). As previous studies have shown (Brandolini et al., 2004), two important reasons for those differences are the low propensity of wealthy individuals to participate in the survey (D'Alessio and Faiella, 2002) and the under-reporting behaviour of participants (Cannari and D'Alessio, 1990).

This paper focuses mainly on the second issue. Nonetheless, the two aspects are closely related, since under-reporting is more common among the rich. In the present analysis, under-reporting refers both to inaccurate statements about the ownership of a specific asset and to errors in the declared amount owned. We propose a method for dealing with such problems, using data from a customer survey conducted by a leading Italian banking group as a supplementary source of information.

## 2. The extended supplementary sample

The "extended" supplementary sample (ESS) comes from a survey carried out in 2003 by a leading Italian banking group. In order to maximise data comparability, the survey design and implementation were set up to be as similar as possible to those of the SHIW.<sup>2</sup> The reference population consists of customers who authorised the disclosure of their data for research purposes, as required by Italian privacy law.<sup>3</sup> The population is stratified according to geographical area of residence, size of municipality and, more importantly, financial wealth held at the bank. The survey collects data on 1,834 households. The overall response rate was 18%, but the presence of financial wealth brackets as a stratification variable makes it possible to re-weight each observation to control for selection bias due to non-response among wealthy households.

The main feature of the ESS is that data were linked with the bank's administrative databases by an exact matching procedure, "extending" the information collected. Each

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<sup>2</sup> The survey design was developed in collaboration with the Bank of Italy's Economic Research Department, which produces the SHIW. The same market research firm managed the survey field, using, as far as possible, the same interviewers as for the SHIW. A Computer Assisted Personal Interviewing (CAPI) methodology was used for data collection and the same software was used to develop it.

<sup>3</sup> The target population consists of the bank's current account holders and excludes customers under 20 years of age and over 80, and those holding less than 1,000 euros or more than 2.5 million euros.

respondent answers regarding his or her financial assets held at the bank, and therefore the self-reported wealth is comparable with that shown in administrative records. Financial data were available for six aggregate financial assets (deposits and repos, government bonds, private bonds, quoted shares, mutual funds and managed savings) and for financial liabilities.

Assuming that ESS respondents are representative of customers of other banks, the information can be extrapolated to the 2002 SHIW data.<sup>4</sup> In order to control for the different demographic composition of the two samples, the sampling weights were post-stratified to reproduce the distribution of the Italian population of bank customers.

### 3. The adjustment method

The econometric framework used is based on the *hurdle model* (Wooldridge, 2002). The approach consists in separately modelling the decision about whether or not to invest and the decision about the amount to invest. It represents an alternative to regression with censored variables, typically carried out with Tobit models (see Maddala, 1983). The adjustment procedure comprises three steps.

The first step is to estimate under-reporting on ownership. The response variable, obtained from the administrative records, is a dummy for the effective possession of an asset at the household level. The probability of under-reporting is estimated by including among the covariates a dummy for the asset ownership declared in the interview. The analysis is carried out separately for the six financial assets and for the financial liabilities.

Step 2 models the under-reporting on the amount held, defined as the ratio between the actual and reported amount for each asset class. The ratio is computed at the individual level, and is assumed to be a proxy for reticence at the household level. The log of the ratio is regressed on the household's declared amount, its squared value, and a set of social and demographic characteristics.

The third and last step fits the preceding estimates to the SHIW data. We assume that the models estimated in the previous steps hold for all Italian households. For each financial instrument, the estimated probability of holding a given asset is fitted at the household level. A random experiment is then used to impute ownership to households that are likely to possess an asset,<sup>5</sup> whether they declare it or not. For each asset, we reconstruct the amount owned by the households to which the experiment attributes ownership, even if they did not declare it. Finally, the estimated coefficients of misreporting on amounts are fitted to the SHIW data to obtain an inflation factor (or, less often, a deflation factor) for the declared amount.<sup>6</sup>

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<sup>4</sup> Since the ESS respondents know that the survey is being conducted by their bank, they might be less reticent than the SHIW respondents. This would imply that the adjustment method proposed would not fully correct for the under-reporting. Unfortunately, the data at hand do not enable us to test this hypothesis.

<sup>5</sup> Symmetrically, the same mechanism attributes the status of non-possession of an asset to households unlikely to possess it, even if they declare the contrary to be the case. This is justified by the fact that over-reporting, albeit on a small scale, is present in the ESS data.

<sup>6</sup> To ensure the consistency of the estimated coefficients, they are first multiplied by an adjustment factor derived from an auxiliary regression (see Wooldridge, 2002). Such a correction is necessary whenever predicted values are derived from a regression with a logarithmic transform as dependent, in order not to under-estimate the true value.

## 4. Main results

The respondents' reticence, measured by the percentage of sample units failing to declare ownership, varies according to the financial instrument, ranging from a minimum of 5–6% for managed savings and government bonds to a maximum of 22–27% for mutual funds and private bonds. As to the under-reporting of amounts, reported values tend to be 50% of the corresponding administrative ones. This percentage drops significantly for private bonds (16.8%), whereas it ranges from 40% to 60% for mutual funds, managed savings and government bonds.

Under-reporting is higher for elderly, retired or less educated heads of household, in particular for government and private bonds and for mutual funds. Self-employed heads of household are more reticent in declaring shares and private bonds. People of low educational level primarily under-report government bonds, while the well-educated under-report shares. Furthermore, under-reporting is higher for households residing in the northern regions or located in the upper tails of the income and tangible wealth distributions.

Fitting the previous results to SHIW data significantly increases Italian households' financial wealth and the complexity of their portfolios. The percentage of households owning at least one financial asset increases from about 74.3% to 79.4% (Table 1). The share of those with private bonds jumps from 6.4% to 23.9%. Similarly, the diffusion of mutual funds increases from 11.2% to 29.3%. At the same time, the percentage of households with financial liabilities increases from 21.3% to 25.9%. The adjusted total financial wealth is about 2.7 times the original value, inflating the unadjusted value of 22,000 euros to 59,000 euros.

Looking at the distribution of the financial assets, the adjustment replaces zeroes or low values with values closer to the cell average values, thereby reducing the concentration: the Gini coefficient decreases from 0.790 to 0.721 (despite the fact that under-reporting is more common among the rich), and the decrease is significant when sample variability is taken into account. There is a similar effect for liabilities, although on a smaller scale (the corresponding Gini coefficient goes from 0.925 to 0.914).

We can produce a synthetic view of the effects of the adjustment by showing how the percentages of households with increasingly riskier portfolios vary (Table 2): the quota with low-risk portfolios (only deposits and repos) decreases from 56% to 31%, whereas riskier assets become more widespread (from 19% to 42%).

The adjustment procedure allows us to account for a large part of the gap between the SHIW and the NFA. As shown in Table 3, the sample estimate for total financial assets increases from about 31% to around 85% of the NFA amount. The corresponding percentages for liabilities are 47% and 65%.

Table 1

**SHIW: effects of the adjustment on the estimates**

<b>Assets</b>	<b>Starting values</b>	<b>Step 1</b>	<b>Final step</b>
	<i>(percentage of owner households)</i>		
Deposits and repos	73.4	73.4	73.4
Government bonds	9.4	12.2	12.2
Private bonds	6.4	23.9	23.9
Shares	10.1	17.3	17.3
Mutual funds	11.2	29.3	29.3
Managed savings	2.0	4.5	4.5
<b>Total financial assets</b>	<b>74.3</b>	<b>79.4</b>	<b>79.4</b>
<b>Financial liabilities</b>	21.3	25.9	25.9
<b>Average amount</b>	<i>(euros)</i>		
Deposits and repos	11,115	11,115	15,316
Government bonds	2,426	3,166	5,810
Private bonds	1,836	6,979	18,736
Shares	1,844	3,183	3,703
Mutual funds	3,071	7,883	10,715
Managed savings	1,395	2,868	4,221
Total financial assets	21,687	35,194	58,502
Financial liabilities	6,428	6,666	8,941
<b>Total financial assets</b>	<b>21,687</b>	<b>35,194</b>	<b>58,502</b>
<b>Financial liabilities</b>	6,428	6,666	8,941
<b>Gini coefficient (total financial assets)</b>	0.790	0.727	0.721
<b>Gini index (financial liabilities)</b>	0.925	0.914	0.914

Step 1: adjustment for non-reporting; Final step: adjustment for misreporting on amounts.

Source: Compiled by author.

Table 2

**SHIW: households' portfolios  
sorted by increasing levels of risk**

Percentage of households

	Starting values	Final step
Deposits and repos only	56.2	31.2
Deposits and repos + government bonds	5.9	2.4
Deposits and repos + government bonds + other risky assets	4.7	10.4
Deposits and repos + other risky assets	18.9	41.6

Source: Compiled by author.

Table 3

**Comparison between the SHIW and the  
Italian National Financial accounts: 2002**

Assets <sup>1</sup>	Starting values	Step 1	Final step	National Financial Accounts <sup>2</sup>
<b>Average amount</b>	<i>(Index. Financial accounts = 100)</i>			<i>Billions of euros</i>
Deposits and repos	55.5	55.5	76.5	421
Government bonds	28.7	31.3	57.4	213
Private bonds	11.2	38.4	103.1	382
Shares	31.1	51.2	59.6	131
Mutual funds	25.5	54.3	73.8	306
<b>Total financial assets</b>	<b>31.4</b>	<b>51.0</b>	<b>84.7</b>	<b>1.453</b>
<b>Financial liabilities</b>	46.6	61.0	64.9	290

Step 1: adjustment for non-reporting; Final step: adjustment for misreporting on amounts.

<sup>1</sup> Financial accounts do not produce a separate figure for managed savings. The relative sample estimate has accordingly been attributed to the other assets, using external information on the portfolio composition of financial intermediaries (published in the Statistical Bulletin of the Bank of Italy). <sup>2</sup> The following assets are not included: currencies, insurance technical reserves and postal deposits and unquoted shares.

Source: Compiled by author.

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