

# Measuring the value of micro-enterprises in financial accounts

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## Introduction and summary<sup>2</sup>

Census data show that in Italy approximately 3.4 million nonfinancial enterprises (out of a total of 4 million) are sole proprietorships or other unincorporated businesses.<sup>3</sup> Virtually all are very small “micro-enterprises”. Such enterprises account for just under one half of employees<sup>4</sup> in the nonfinancial sector and therefore contribute significantly to overall economic activity. Likewise, their value is likely to account for a significant share of national wealth. However, the unavailability of direct statistical sources such as balance sheet data makes the measurement of their value a tricky task.

According to international statistical standards, unincorporated businesses belong to either the household sector (“producer households”) or the nonfinancial sector (“quasi-corporations”), depending on size and other characteristics. This distinction makes a difference to financial accounts (FA). The financial assets and liabilities of producer-household firms, such as bank accounts or loans received, are recorded in the FA as assets/liabilities of households; on the other hand, the real assets of such firms, such as buildings or machinery, do not enter the financial accounts. The standard is different for quasi-corporations. Since quasi-corporations are treated as separate entities, their total net worth should appear in the FA both in the household sector, as an asset in the form of “shares and other equity”, and in the nonfinancial sector, as the counterpart liability in the same financial instrument. However, this component of equity in the FA is usually difficult to estimate and, consequently, it appears to be missing in the published data for many countries – including, so far, Italy.

This paper explains the strategy that the Bank of Italy is developing for estimating the net worth of nonfinancial quasi-corporations in order to fill the gap in the national FA. This strategy is mainly based on survey data from the Bank of Italy Survey on Household Income and Wealth (SHIW), which contains questions on households’ equity holdings in all types of businesses. It also makes use of banking statistics and other financial statistics.

Parallel work, based on a similar methodology, is under way concerning the estimation of the value of nonfinancial assets of micro-enterprises that are not quasi-corporations (producer

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<sup>3</sup> Sole proprietorships are defined in Italian law as “*ditte individuali*”. We use the term “unincorporated businesses” to mean “*ditte individuali*” plus all types of business partnerships, as defined by Italian law, in which partners (or some of them) have unlimited liability: *società in nome collettivo*, *società in accomandita semplice*, *società semplici*, *società di fatto*. Certain types of unincorporated businesses (*società in nome collettivo*, *società in accomandita semplice*) are required to hold a complete set of accounts, whereas others are not. None is required to publish accounts.

<sup>4</sup> In this paper, we use the word “employee” as synonymous with “worker”. This usage is somewhat loose, as the employer and his/her family may also count as workers in firms’ statistics even if they are not employees. The distinction can make a significant difference among micro-enterprises.

households), with a view to producing a comprehensive account of household wealth. This work does not directly impact the FA and will not be described here.

Using micro data on micro-enterprises for the estimation of macro statistics presents some difficult conceptual and practical problems. We discuss, among other things, issues of definition and the treatment of nonreporting behaviour, as well as the compatibility of estimated totals with independent macroeconomic information.

## Background

Italy is a country of small firms. According to census data, the average number of employees of firms engaged in nonfinancial activities was 3.7 in 2001. Approximately 4 million nonfinancial enterprises were actively operating in Italy in the same year, some 90 percent of which had five employees or fewer. Enterprises with up to five employees accounted for nearly 40 percent of total employment in nonfinancial businesses, thus representing a very significant share of economic activity. Figures have been evolving only very slowly over time, with the average number of employees increasing by 0.1 percentage point in four years, with the most recent updates largely confirming this fact. Fully accounting for micro-enterprises in macroeconomic statistics, including financial statistics, is therefore very important. It is also a challenging task.

For financial accounts, it is not too difficult to account for small enterprises, as long as they take the form of corporations. However, a large majority of micro-enterprises are constituted as sole proprietorships or some form of unlimited partnership. Some 3.4 million nonfinancial enterprises are unincorporated; virtually all unincorporated businesses are small. Legally, such entities are not required to publish their balance sheets or even, in many cases, to keep a separate set of accounts in any form. One way or the other, they escape statistical recording, hence their value is unknown and needs to be estimated.

Unincorporated businesses fall into two categories for the purposes of statistical classification. According to international recording standards as set out in ESA95, some of them are called “quasi-corporations” and are included in the nonfinancial sector. Quasi-corporations are defined as organisations not having independent legal status, that keep a full set of accounts, and whose economic and financial behaviour is different from that of their owners. This is a rather general description and it has to be operationalised at the national level. In Italy, the operational definition of nonfinancial quasi-corporations includes all firms with more formal types of unlimited partnerships (*società in nome collettivo, società in accomandita semplice*), regardless of size; it also includes simpler partnerships (*società semplici, società di fatto*) and sole proprietorships (*ditte individuali*), provided they have more than five employees.<sup>5</sup> Enterprises falling within this category are assumed to possess the character of quasi-corporations and are therefore to be recorded in the nonfinancial sector. The rest (ie simple partnerships and sole proprietorships with up to five employees) are to be recorded in the producer households subsector.

This distinction makes a difference to financial accounts (FA) and, more generally, to macroeconomic statistics. In the case of producer-household firms, no separation is assumed to exist between the firm and its owner(s). Consequently, the financial assets and liabilities of such firms, such as bank accounts or loans received, are recorded in the FA as

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<sup>5</sup> The five-employee threshold is a national convention. Other countries may use different thresholds and/or criteria.

assets/liabilities of households. On the other hand, the real assets of the same firms, such as buildings or machinery, do not enter the financial accounts.

The standard is different for quasi-corporations. Quasi-corporations are treated as separate entities with respect to their owners. Their total net worth should therefore appear in the FA in the form of “shares and other equity”, the financial instrument representing items associated with property rights in corporations and quasi-corporations. In line with double-entry accounting rules, this value has to be recorded twice: as an equity holding (asset) of the household sector, and as the counterpart liability of the nonfinancial sector, ie as the net equity (or own funds) component of the liability side of the micro-enterprise’s notional balance sheet. However, the value of the net equity of quasi-corporations is usually difficult to estimate, as its estimation presents some nontrivial conceptual and practical problems. Consequently, it appears to be absent in the published FA for many countries. At the moment, the value of quasi-corporation equity is not recorded in Italian financial accounts.

This paper focuses on quasi-corporations; more specifically, on the estimation of their net worth for the purpose of compiling the FA. A similar methodology to the one we develop here for quasi-corporations can be applied to producer households, in order to estimate the value of the nonfinancial component of the assets of those micro-enterprises that do not qualify as quasi-corporations. As noted above, this component is not included, by definition, in the FA, but it is part of the national private wealth. Parallel work on producer households is therefore under way, with a view to producing a comprehensive account of household wealth. This work will not be described here.

In Italy, according to the national definition, quasi-corporations comprise nearly 850,000 firms, 77 percent of which are “micro-enterprises” with up to five employees. These firms account for one third of total employees in the nonfinancial sector and are mainly engaged in trade and other services. Table 1 presents more data on the significance and distribution of these firms.

Table 1  
**Quasi-corporations in Italy in 2001**

<b>Nonfinancial quasi-corporations</b>	
Number of quasi corporations	849,168
of which:	
– with up to five employees	77.1%
Employees of quasi-corporations	3,465,301
<b>Share of quasi-corporations in total for non-financial corporations and quasi-corporations</b>	
Number of units	58.2%
Number of employees	29.0%
Value of output	22.1%

Source: ISTAT (census data, ASIA archive, national accounts).

## Methodology and results

How much are quasi-corporations worth? As we mentioned earlier, balance sheets of unlimited partnerships, as well as those of sole proprietorships, to the extent that they exist at all, are not publicly available. Therefore there is no direct information even on the order of magnitude of their value. In what follows, we examine three independent methods for estimating this value, and suggest an overall strategy that combines two of them.

The first two methods are based on data from the Bank of Italy's Survey on Household Income and Wealth (SHIW),<sup>6</sup> which contains direct questions on the value of households' equity holdings in all types of businesses.

The third method exploits information, available from supervisory statistics, about the financial debt of quasi-corporations towards the banking system, and makes an attempt to assess the value of quasi-corporations in an indirect manner.

All three methods involve consistency checks with available macroeconomic information. Each method has advantages and drawbacks; comparing estimates obtained using different sources and criteria provides the benefit of independent appraisals. It turns out that, for the year 2004, the range of estimates is quite small, which is an encouraging sign that reasonably reliable statistics may be compiled by making use of this information.

*Method 1: SHIW-based, net equity per enterprise.* In the Bank of Italy Survey on Household Income and Wealth, households are directly asked to give an estimate of the value of any enterprise(s) they own. Since the survey also contains information on the legal type and the number of employees of such enterprises, in principle it is possible to identify the subset QC of households whose firms qualify as quasi-corporations, based on the national definition explained above. The total value of quasi-corporations could then be estimated by using the following straightforward formula:

$$\text{Total value of quasi-corporations} = \sum_{i \in \text{QC}} \text{VAL}_i \cdot \text{WGHT}_i, \quad (1)$$

where  $\text{VAL}_i$  is the market value of quasi-corporations owned by household  $i$ , as declared by the same household, and  $\text{WGHT}_i$  is the population weight<sup>7</sup> of the household. In other words, once households owning quasi-corporations are identified, the value of their firms is simply expanded to the population total.

However, not all households that declare ownership of a business specify its legal type, therefore it is likely that QC is in fact a subset of quasi-corporation owners, and that the estimator (1) has a downward bias. The evidence also points in this direction. The number of quasi-corporations actually reported in the SHIW, once expanded, is 44% lower than the number of active quasi-corporations provided on a macro basis by the National Statistical Institute figures (ASIA archive). It is thus reasonable to assume that the total value of quasi-corporations is underestimated.

Moreover, among those households that do declare the legal type of their firm, there are some that do not report the firm's value, which must be estimated.

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<sup>6</sup> Bank of Italy (2006).

<sup>7</sup> The population weight is the inverse of the probability of inclusion for a given household in the sample. When it is applied to the whole survey, it reflects the sampling design and reproduces the whole Italian population. See Faiella (2006).

Estimates have therefore to be adjusted for two types of item nonresponse:<sup>8</sup> nonreporting of the legal form, and nonreporting of the value of the business.

There are two ways to adjust the estimates for nonreporting of the legal form: (a) re-weighting the survey data to match the population totals by means of a post-stratification procedure; or (b) imputing omitted responses through hot-deck methods. Both procedures increase the variance of the estimates, but this is unavoidable. In this paper, we use the second procedure.

Hot-deck imputation requires that a subset of eligible “donor” households be identified. “Donors” are households that (a) own a business; (b) did not specify the legal type of their business; but (c) did specify other features of that business (such as type of business, branch of economic activity and number of employees), which are similar to those of quasi-corporations identified for other households. Once a subsample of suitable records is selected, a number of donors are randomly drawn. Random draws are constrained to match the total number and the geographic composition of quasi-corporations resulting from macroeconomic data compiled by the National Institute of Statistics, ISTAT. In this way, a new subset of households is defined,  $QC^* = QC \cup \text{randomly drawn “donors”}$ . Estimates adjusted for nonresponse can be obtained by replacing  $QC$  with  $QC^*$  in (1).

Concerning the second type of nonresponse, ie declared quasi-corporations with unreported value, we imputed a value given by a weighted average of the value of similar firms in the SHIW, controlled for branch of activity and geographic location.

Table 2 reports the total estimated value of quasi-corporations before and after the adjustments. The estimate is about 108 billion euros before any correction. This rises to 167 billion after the first adjustment and to 187 billion after the second.<sup>9</sup>

*Method 2: SHIW-based, net equity per employee.* As mentioned above, both hot-deck imputation and post-stratification increase the variance of the estimator (1). An alternative way to estimate the value of quasi-corporations by means of a more efficient estimator involves the so-called “ratio estimation”.<sup>10</sup>

As in the previous exercise, the set of households declaring ownership of a quasi-corporation,  $QC$ , is selected from the SHIW. Then the average net equity per employee is computed on  $QC$  by means of the following formula:

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<sup>8</sup> On nonreporting behaviour in the SHIW, see Cannari and D’Alessio (1993).

<sup>9</sup> As mentioned in the text, the adjustment for item nonresponse necessarily increases the total variance of the estimator. Specifically, the hot-deck procedure adds to the variance of the estimator because of the random draw of “donors”. However, it turns out that the additional variability is not large. We performed a Monte Carlo simulation of the variability caused by the hot-deck procedure, by iterating the process of estimation 1,000 times. The outcome is reported below:

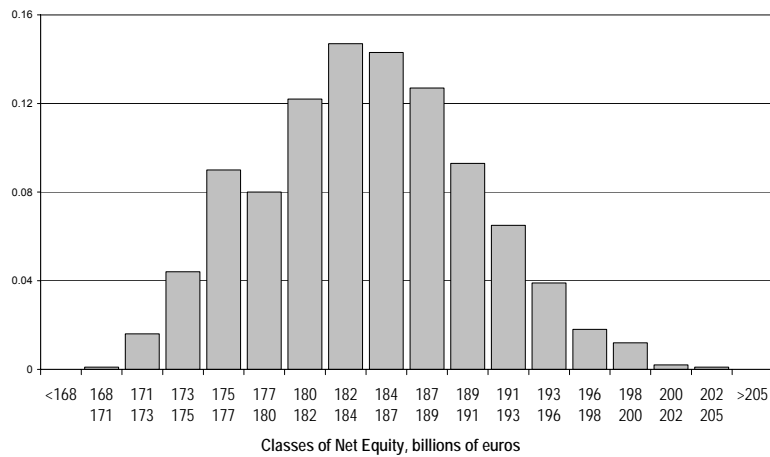
<sup>10</sup> Even though slightly biased, ratio estimation can be more accurate than number-raised estimation if the auxiliary variable is correlated with the variable of interest. Basically, the ratio estimator is, in principle, more efficient than the simple estimator (1) because its variance is lowered by the effect of the covariance between the numerator and the denominator. Furthermore, it does not require hot-deck imputation of missing data, as will shortly be explained.

Table 2  
**Method 1: estimates**  
 Millions of euros

Total value of quasi-corporations		2004
Before any adjustment		107,800
After adjustment for non-reporting of legal type		167,600
After further adjustment for non-reporting of business value		187,800
<b>Memorandum items:</b>		
Geographic distribution of firms	ISTAT <sup>1</sup>	SHIW
North	58.2%	59.8%
Centre	20.5%	17.4%
South	21.3%	22.8%

<sup>1</sup> Source: ASIA (2004).

**Distribution of the outcomes of 1,000 iterations**



Source: author's calculations based on Bank of Italy data.

As the chart shows, most estimates are concentrated within a range of 175-195 billion euro, while their distance from the mean is on average 6 billion euro.

$$\left( \frac{\text{Net Equity}}{\text{Employees}} \right) = \frac{\frac{\sum_{i \in QC} VAL_i \cdot WGHT_i}{\sum_{i \in QC} WGHT_i}}{\frac{\sum_{i \in QC} EMPL_i \cdot WGHT_i}{\sum_{i \in QC} WGHT_i}} = \frac{\sum_{i \in QC} VAL_i \cdot WGHT_i}{\sum_{i \in QC} EMPL_i \cdot WGHT_i} \quad (2)$$

where  $EMPL_i$  is the number of employees in quasi-corporation  $i$ , and other variables are as in (1). Hence the estimated net equity to employees ratio (left-hand side of the formula) is the ratio of two weighted averages: the weighted average value of quasi-corporations in the numerator and the weighted average of the number of employees in the denominator.

In this case, we make no correction for unreported holdings of quasi-corporations. Indeed, unlike under Method 1, such a correction would only be necessary in case of selection bias, ie if unreported quasi-corporations had systematically larger or smaller net equity per employee than reported quasi-corporations. While this cannot be ruled out in principle, there is no obvious reason why this should be the case, nor would there be an indication of the size or even direction of such a bias. On the other hand, computing the ratio on  $QC^*$  instead of  $QC$  would increase the variance of the estimator.

To check whether this procedure gives plausible results, we compute the ratio (2) separately for five size classes, and we compare the results with the same ratio for other types of firms for which the value of the ratio is known. For this purpose, we choose unquoted corporations (which may be assumed to be somewhat closer in their financial structure to quasi-corporations than quoted corporations, so that such a comparison is meaningful). Table 3 reports evidence on net equity per employee.<sup>11</sup>

Table 3  
**Net equity per employee**  
Thousands of euros

	Unquoted corporations	Quasi-corporations
Firm size (employees)		
1–5	59	59
6–9	43	37
10–30	49	29
31–100	64	31
>100	134	n.a.
Average net equity per employee	94	54

Source: Bank of Italy, SHIW ; CEBI/CERVED for unquoted corporations.

<sup>11</sup> We use Italian Central Balance Sheet Office (Centrale dei Bilanci) data. Balance sheet data do not actually report the number of employees. We estimate their number by means of total compensation per employee.

For all size classes, the ratio is similar in magnitude in unquoted corporations and quasi-corporations, but somewhat smaller in the latter. This seems reasonable; the choice of organising a firm as a corporation rather than as an unlimited partnership, other things equal, is likely to be determined in part by the easier access to capital enjoyed by more structured entities; it is therefore to be expected that corporations should have, on average, a higher capital ratio than simpler partnerships of similar size.

Having established the plausibility of the estimates based on (2), we proceed to estimate the total value of quasi-corporations by multiplying the average value of equity per employee in QC by the total number of employees of quasi-corporations given by macroeconomic sources (ie ISTAT's ASIA archive). The results are presented in Table 4.

Table 4

**Method 2: estimates**

Millions of euros, year 2004

Number of workers in quasi corporations	3,533,670
Net equity per employee <sup>1</sup>	53.7
Net equity of quasi corporations (Method 2)	189,659
<b>Memorandum Item:</b>	
Net equity of quasi corporations (Method 1)	187,800

<sup>1</sup> Thousands of euros.

Source: Bank of Italy, SHIW ; (\*) Thousands of euro.

The estimate is very close to that given by Method 1, which is encouraging.

However, one caveat is in order. While the SHIW underestimates the number of quasi-corporations (as explained above under Method 1), it overestimates the number of workers that quasi-corporations employ, compared to the macro-total provided by ISTAT. In other words, those quasi-corporations that households in the SHIW do report in full are, on average, larger than the population mean in terms of number of employees. In principle, this is a further potential source of bias. We leave the investigation of this point to future research.

*Method 3. Banking data, equity/bank credit ratio.* Methods 1 and 2 both rely on SHIW data. The SHIW is unique in providing direct information on the net worth of quasi-corporations; on the other hand, such information may be biased, as the survey sample is designed to be representative of households, not firms owned by them. Indeed, as shown above, even estimating the number of quasi-corporations or the number of their employees on the basis of the SHIW alone would lead to biased results. In order to provide an independent check of these, it is therefore useful to search for evidence, albeit indirect, that is based on totally different sources.

As banking supervisor, the Bank of Italy regularly collects a rich set of data from credit institutions. This includes information on bank credit broken down by counterparty



(sub)sector. Data on the debt of quasi-corporations towards (Italian-based)<sup>12</sup> banks is thus available.

The idea behind the third approach is to estimate the total value of equity for quasi-corporations from total bank credit, by assuming that the average ratio between the two (which we term, somewhat loosely, the “banking leverage ratio”) is the same for quasi-corporations as for some set of corporations that can be assumed to be reasonably similar to them, and for which data are available. Again, we choose unquoted corporations. Given that the average number of employees of quasi-corporations is four, we compute the banking leverage ratio for unquoted corporations with one to five employees, based on balance sheet data.<sup>13</sup> Then we compute:

$$\text{Total value of quasi – corporations} = \frac{\text{Banking debt of quasi – corporations}}{\text{Banking leverage}}, \quad (3)$$

where *Banking leverage* is computed on small unquoted corporations, as just explained.<sup>14</sup> As Table 5 shows, the point estimate (179 billion euros) is again very close to estimates from Methods 1 and 2.

Table 5	
<b>Method 3: estimates</b>	
Millions of euros, year 2004	
Banking debt of quasi corporations	81,419
“Banking leverage ratio”	45.5%
Net equity of quasi corporations (Method 3)	178,972
<b>Memorandum Items:</b>	
Net equity of quasi corporations (Method 1)	187,800
Net equity of quasi corporations (Method 2)	189,659

Source: Bank of Italy, SHIW.

## Discussion and conclusions

The main advantage of Methods 1 and 2 is that they rely on the only direct piece of information on the net worth of quasi-corporations that is available, namely the SHIW. Moreover, if the macro estimate of net worth is based on survey micro data, then it is possible to perform microeconomic analysis in a way that is consistent with macro

<sup>12</sup> Given the nature of nonfinancial quasi-corporations, it is unlikely that adding transactions with non-Italian banks would make any difference.

<sup>13</sup> Italian Central Balance Sheet Office (Centrale dei Bilanci).

<sup>14</sup> In fact, we do not use the overall average leverage ratio of small corporations. We compute a weighted average of the banking leverage ratios of small-scale (five employees) corporations belonging to those branches of economic activity where quasi-corporations are typically specialised. However, further refinement of this procedure is under way.

aggregates. It is also possible, in principle, to derive estimates at various levels of disaggregation in a consistent way, though there is a limit inasmuch as the sample size of the SHIW is too small to give reliable estimates for small subsets of corporations (eg by region, industry or size class).

The main weakness of Method 1 is that its results are suspect, as the SHIW underestimates the universe of quasi-corporations. Any correction for this (eg post-stratification or hot-deck imputation) increases the total variance of the estimator.

Method 2 is, in principle, more efficient than Method 1, and it is also more transparent and easier to compute, as it does not require any special manipulation of the data. On the other hand, it also suffers from the limitations of the SHIW as a sample of quasi-corporations. A point that is especially relevant to Method 2 is that the SHIW overestimates the number of workers that quasi-corporations employ. Therefore the estimated net equity to employees ratio may well be biased, although even the direction of any bias is unclear.

A common problem with SHIW-based methods is that the SHIW is available only every two years. Therefore any estimates must be interpolated and updated in some way to serve as input to the financial accounts, which are compiled quarterly.

Method 3 is as simple to compute as Method 2, and it provides a useful independent check on the other two methods. It is also available at high frequency (monthly). However, it relies on the strong assumption that the banking leverage ratio of quasi-corporations is equal to that of corporations with up to five employees. This assumption may not be unreasonable, but there is no direct evidence to corroborate it. Furthermore, while the indirect evidence provided by the comparison with SHIW-based estimates is surely welcome, it is worth noting that estimates based on Method 3 are rather sensitive to the exact definition of the reference set. For example, changing the reference set to unquoted corporations with up to 10 employees (instead of five) would increase the banking leverage ratio by 8 percentage points, from 45.5 to 53.5, and would therefore shrink the estimate of the total net equity of quasi-corporations by 15 percent (about 27 million euros).

All in all, it seems reasonable to use a SHIW-based method as a benchmark. Given that the estimator of Method 1 has, in principle, a higher variance, Method 2 seems preferable. Method 3 can be employed as an auxiliary method for interpolation and extrapolation and, in addition, as a way to cross-check the results.

It is encouraging that, when applied to 2004 data, all methods give very similar results, all in the rather narrow range of 178–190 billion euros. While further robustness checks are warranted,<sup>15</sup> we feel confident that this is a good starting point for developing a method for regular estimation of the total value of nonfinancial quasi-corporations.

Revising financial accounts to insert this estimate would result in significant changes in some important financial aggregates. The total amount of the “shares and other equity” instrument would increase by approximately 25 percent; the value of households’ financial assets would be revised upwards by about 5–6 percent, and that of the nonfinancial sector’s liabilities by 7–8 percent.

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<sup>15</sup> By end-2007, data from a new wave of SHIW (2006) will become available.

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