Estimate NOE in Italian approach

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Summary

1. Unregistered labour input
2. Under-reporting of value-added
3. Reconciling the supply and the demand aggregates
4. Conclusion

First of all

Istat believes that many of the non-observed productive activities may be measured correctly through an exhaustive estimate of the volume of labour that participates in the production of income.

The approach can give good results in an economic system characterized by many small enterprises, high volume of unregistered employment, considerable underreporting of production by enterprise.

Basic assumptions

A **strong labour force survey** should be the main condition for applying the LIM

Istat main assumptions:

1. respondents in the household surveys have less reasons than enterprises to conceal the nature of their work; so **household surveys capture both registered and unregistered employment**. This is also demonstrated empirically by the fact that they generally record a higher number of persons in employment than the business-side surveys.
2. **economic data** declared by registered enterprises **do not include the value of production provided by unregistered employement**.

1 - Unregistered labour input

Unregistered labour input estimation

:

- The level of employment is defined in a ***benchmark year***, where the availability of sources is at the maximum.
- Once the levels of the base year are fixed, estimations are updated with the information resulting from surveys currently performed by ISTAT and from sources of administrative nature.

1 - Unregistered labour input

$$U_{bc}=a_{bc}A_{bc}+b_{bc}B_{bc}+c_{bc}C_{bc}+d_{bc}D_{bc}+e_{bc}E_{bc}+f_{bc}F_{bc}$$

U = Units of full-time equivalents

A = Unique jobs, registered

B = Multiple jobs, registered

C = Informal jobs

D = jobs of resident, unregistered

E = Foreigner jobs, non resident (and unregistered)

F = Multiple jobs, unregistered

a, b, c, d, e, f, g = Coefficients of transformation of jobs into full-time equivalents

1 - Unregistered labour input

A registered, unique
- full-time
- part-time

B registered multiple jobs

C informal

Registered jobs (declared by institutions and enterprises)

D unregistered residents

E foreigners non residents

F unregistered multiple jobs

Unregistered jobs (identified using households surveys or indirect estimation)

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2- Under-reporting of VA

The exhaustive NA value added

CN = IND + *ΔRI* + *ΔNOR* + *ΔSEC* +*ΔQUA*

IND	survey data on value added
ΔRI	re-evaluation VA by regular units of labour
ΔNOR	V.A. by irregular Units of labour
ΔSEC	ESA components
ΔQUA	balancing of resources and uses
CN	national account value added

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2- Under-reporting of VA

Some specifications

- *(IND + ΔRI)* is equal to the re-evaluated per capita value added multiplies by regular workers

- *ΔNOR* is equal to the re-evaluated per capita value added multiplies by non regular workers

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2- Under-reporting of VA

The problem is:

Estimate the re-evaluated per capita value added

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Estimate the re-evaluated per capita value added (1)

The assumption is that enterprise net income should grant self-employed remuneration not lower than the wage of an employee working in the same industry with similar skills and working time

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Estimate the re-evaluated per capita value added (2)

If self-employed workers earn less than employees, it is assumed that they prefer to change their employment status, from self-employed to employed.

When profit and losses data declared by enterprises are not consistent with the above hypothesis, it is then assumed that self-employed were reluctant in state their receipts or over-reported intermediate costs; the above enterprises are then identified as under-reporting enterprises and, as consequence, undergo revaluation.

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Estimate the re-evaluated per capita value added (3)

Step 1 –per capita revenue of emploees

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Step 2 - • adjustment of the per capita step 1, to take in account the different working hours between employees and self employer

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Step 3 - enterprise net income

↓

Step 4 - per capita enterprise net income of self employer

↓

Step 5 - if the result of step 4 is negative or less than that of Step 2 is recalculates the enterprise net income attributing to each self employer the per capita of step 2

Estimate the re-evaluated per capita value added (4)

Step 6 – we adding to the enteprise value added , the difference between the result of Step 5 and the result of Step 3.

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Step 7 – we have for each enterprise two value added :

1. *Declared*
2. *Re-evalued*

↓

Step 8 – re-evaluted per capita value added by branch, for each branch we divide value added for workers declared by enterprises

Estimate the re-evaluated per capita value added (5)

The correction apply in turn to **turnover** (revaluating it) or **intermediate costs** (decreasing then), depending on the comparison of the ratio of these aggregates and the workers to the similar average ratio within the stratum.

Stratification of enterprises by:

- •Geographical area (NO; NW, C, S)
- •Juridical form (non stock company, cooperatives, stock co., etc.)
- •Size class (up to 500.000;500.000-5.000.000; over 5.000.000)
- •Enterprise life time (0-3; 4-6; 7-9; 10-19; 20 and over)
- •Economic activity (3 digit)

Estimate the re-evaluated per capita value added (6)

Adjustment on output or on cost?

$$(I\_turn)_{ij} = \frac{(K^*)_j}{(K)_{ij}}$$

$$(I\_cost)_{ij} = \frac{(C)_{ij}}{(C^*)_j}$$

C_{ij}, K_{ij} =cost and turnover by worker of the i[th] under reporting business belonging to stratum j.

C^*_j K^*_j=cost and turnover by average worker of non-under reporting business belonging to stratum j.

Estimate the re-evaluated per capita value added (7)

Costs are adjusted if

$$(I\_cost)_{ij} > 2$$

$$(I\_cost)_{ij} > (I\_turn)_{ij}$$

In all the other cases the turn-over is adjusted

Estimate the re-evaluated per capita value added (8)

The hidden economic aggregate produced by regular worker is equal

$$\Delta RI = \sum_{b=1}^{m}\sum_{c=1}^{z}(X'_{bc} - X_{bc})\cdot Ureg_{bc}$$

The hidden economic aggregate produced by non regular worker is equal

$$\Delta NOR = \sum_{b=1}^{m}\sum_{c=1}^{z} X'_{bc}\cdot Uirr_{bc}$$

Reconciling the supply and the demand aggregates

The preliminary estimate undergo balancing procedure within a supply-use tables

Balancing total resources with uses by assigning the aggregates different degree of reliability: ΔQUA can be positive value if supply are lower than demand preliminary estimate or a negative value if supply is higher than demand (for the totale demand>supply)

Two different Hypothesis

- *ΔRI* and *ΔNOR* are specifically attributable to the underground economy phenomenon

  (*minimum hypothesis= ΔRI + ΔNOR*)

- *ΔQUA* is the result of a mixture of statistical and economic underground

  (*maximum hypothesis= ΔRI +ΔNOR+ΔQUA*)

Conclusions (1/2)

Strengths of the Istat method

- The Istat approach for the input of labour estimation uses micro statistical methods and several sources of data in order to measure registered and unregistered jobs
- Labour input estimates are mainly used for estimating value added and production and minimising the problems of identifying the active enterprises and their structural changes
- Estimates follow the criterion of the exhaustiveness and the international suggestions regarding the GDP harmonisation among the Union countries.

Conclusions (2/2)

- Methodologies enable clear identification of the so ***called underground area for economic reasons***
- The above methodologies are constantly verified by EUROSTAT and other international bodies like IMF
- The results obtained are coherent over time
- Estimates on the underground economy like those on unregistered employment can be detailed by industry, size of enterprises and types of integration