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THE UNDERGROUND ECONOMY IN ITALIAN ECONOMIC ACCOUNTS

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PREFACE

This study contains researches, statistical-economic analyses and methodologies produced by the Department for National Accounts and Economic Analysis to quantify underground economy, on the occasion of the revision relating to 1982.[1]

Measurement methodologies illustrated are those contained in the publication of the National Statistica, Serie IX, Vol.9, and in subsequent updated versions.[2]

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[1] The studies were collected and organised by Dr. Antonella Baldassarini who also contributed her ideas to Chapter 1 - Concepts and definitions.

[2] The updated versions are contained in the "Inventory of statistical sources and methods for estimating GNP and its components", which was compiled for ISCE in compliance with Art. 4 of the Council Directive of 13 February 1989 No. 89/130/EEC, Euratom, on harmonisation of gross national product at market prices.

PART I

THEORETICAL ASPECTS

1. CONCEPTS AND DEFINITIONS

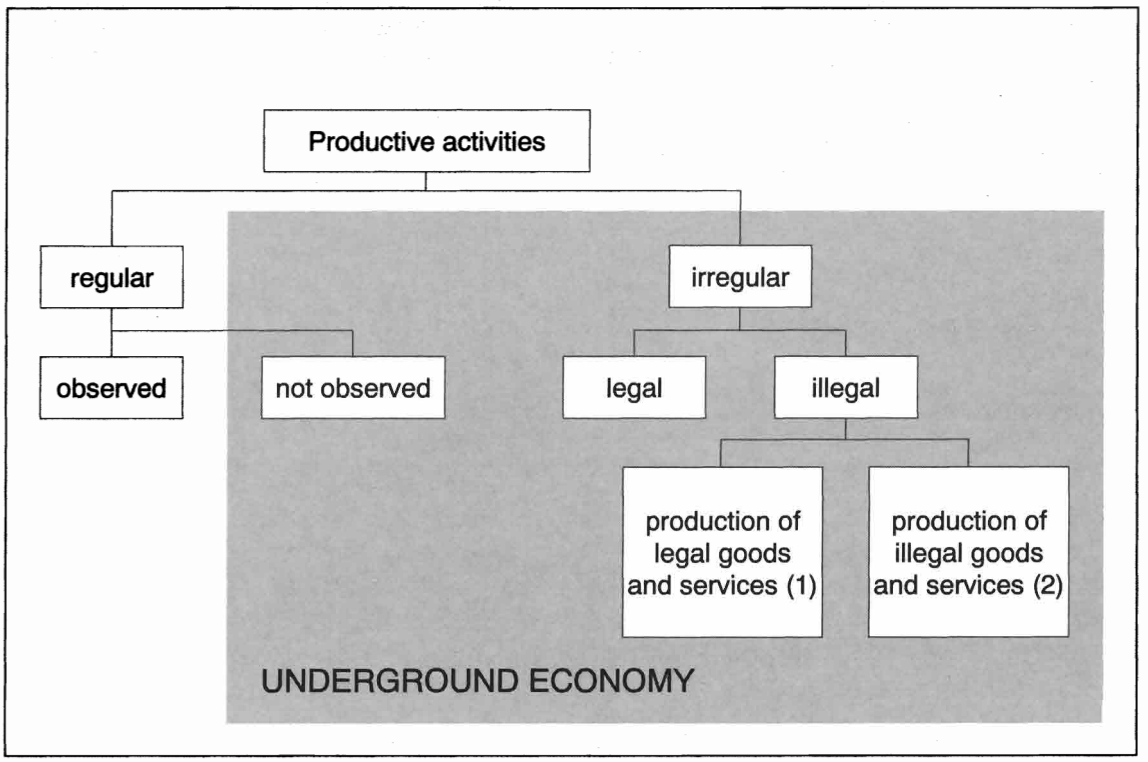
1.1 The underground economy forms part of the economy: its dimension is defined by a number of features and behaviours within the socio-economic system, such as: the size of firms; fiscal regulations; social control; the historically consolidated behaviour of entities and the behaviour of new entities, etc. Underground economy can be defined within the production boundaries established by the European System of integrated economic accounts (SNA).

Production is the creation of goods and services that may satisfy human needs, and in the national accounting model, all productive economic activities for which some sort of monetary recompense is made for factors employed come under this heading. Conventionally, some other activities are added, such as: the family consumption of foodstuffs grown by members of the same family in charge of agricultural holdings; the direct use of dwellings in ownership ; the self-production of investment goods. Within the production framework, activities may be visible or underground, legal or illegal. The old "ESA", still in force today, made no mention of these categories, not even to exclude them. The new "SNA" includes them expressly.

1.2 In the framework of economic activities as defined above, the underground economy may be identified by adopting either a socio-economic approach or a statistical approach.

1.3 Following a socio-economic approach (Chart 1), it is possible to make out:

Chart 1 - SOCIO-ECONOMIC APPROACH



[1] Legal activities that become illegal if performed by an operator not authorised by law (e.g. clandestine abortion and gambling).

[2] Prostitution, production and sale of drugs, etc.

a) a regular economy, consisting of productive activities, regulated and taxed by the State;

b) an irregular or underground economy, including productive activities which are "hidden" or irregular, i.e. they do not comply with at least one of the provisions of tax regulations or social security laws. It includes legal but irregular productive activities and illegal productive activities, i.e. carried out in violation of a civil or penal provision. The latter produce legal goods and services (e.g. abortions, gambling, etc.) or illegal commodities and services (e.g. trafficking and selling of drugs, prostitution, etc.).

1.4 Following the statistical approach (Chart 2), it is possible to divide the economy into two parts:

a) an economy observed statistically;

b) an economy that is underground or not observed statistically.

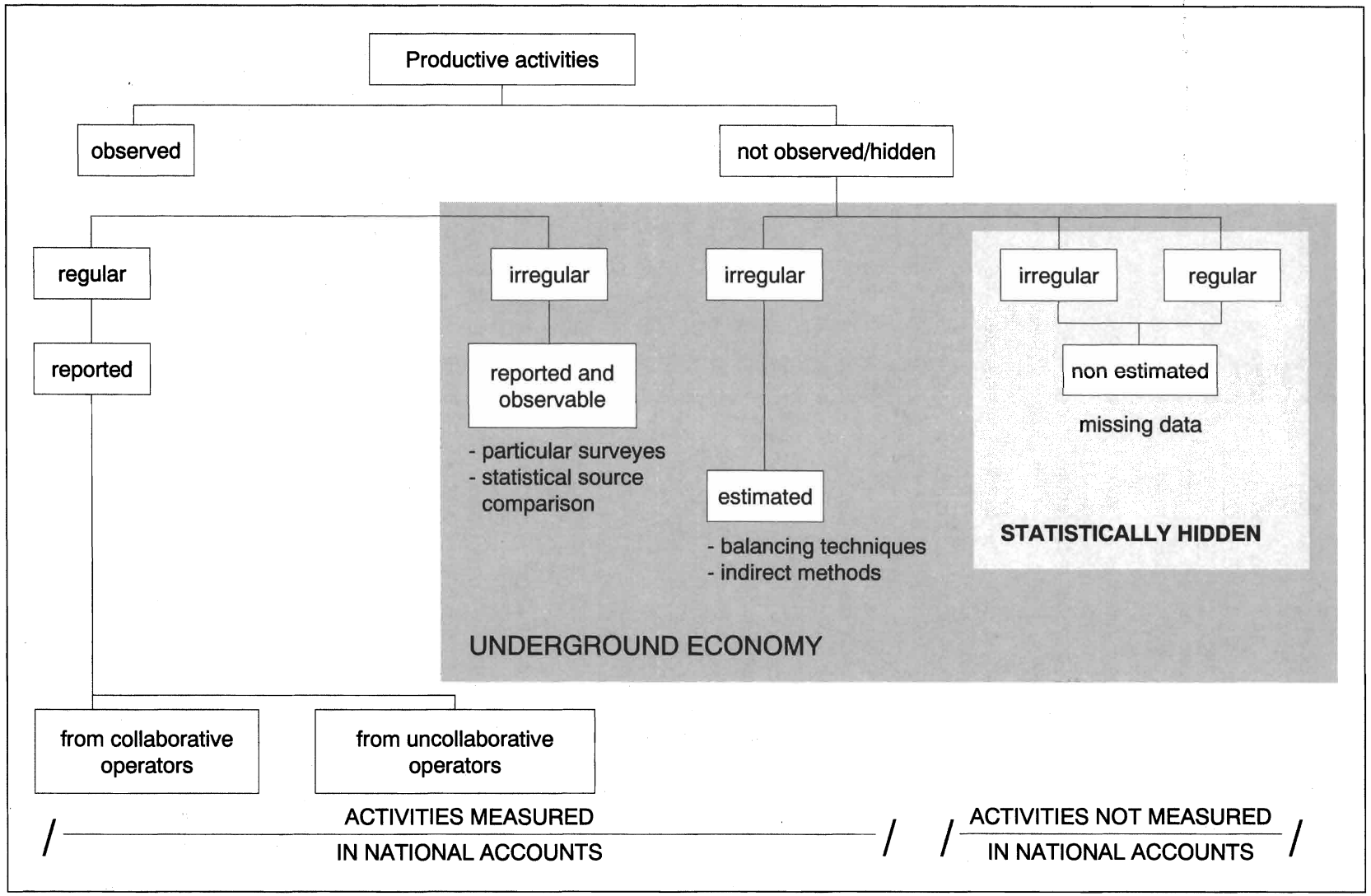
Practically all of the regular economy is observed statistically, and a part of the irregular economy, although it is underground from an economic point of view, does not escape statistical observation. The latter is undertaken by means of specific sample surveys or is carried out by analysing discrepancies or the different values of statistical data which quantify different aspects of the same phenomenon.

That part of the economy for which statistical information is completely lacking is considered to be underground and therefore not observed statistically. The largest part is accounted for by the irregular economy that wishes to escape observation, and, a smaller proportion is accounted for by the regular economy that cannot be investigated since it consists of entities which are not registered, either because the registers have not been updated or because they were updated after the survey took place.

The irregular economy that is not surveyed either directly or indirectly and which therefore wishes to escape observation is nevertheless normally observed in economic accounts. This part of the economy is appraised by using statistical techniques that permit totally or partially missing data to be added, or it may emerge by adopting account-balancing techniques.

This overview clearly shows the intention to reduce to a minimum that part of productive activities which is not statistically quantified, and at the same time to highlight separately both that part of the underground economy uncovered by statistics and that part which is estimated using indirect methods and balancing techniques.

Chart 2 - STATISTICAL APPROACH



2. ESTIMATIVE METHODS

2.1 Economists and economic statisticians have used various methods for estimating the underground economy, and they can be divided into three categories: direct methods, indirect methods and mixed methods.

"Direct methods" are based on data gathering through statistical sample surveys conducted on families, individuals and businesses to investigate into their active or passive participation in the underground economy. Tax evasion controls and sample surveys on balance-time come into this category.

A number of techniques are used in the indirect methods category: that which aims to identify the phenomenon through discrepancies among various observed sources; monetary techniques, based on the relationship between cash availability and bank deposits or between cash availability and income; techniques analysing the activity rates of the population; analyses of the awareness of the underground economy problem and other similar techniques.

"Mixed methods" are those which make use of both direct and indirect information, or those that use the method of 'estimates' made by experts.

These methods allow to estimate not only observed economy, but also the underground economy, which is generally added, but not integrated within the accounting system.

2.2 National accounting authorities in Italy have however adopted an original approach. The "underground economy" phenomenon has been dealt with ex ante and in overall terms with regard to the problems of measuring different aggregates, and therefore the methodological solutions adopted to quantify this phenomenon are included in the system. It is thus only possible ex post to carry out a conceptualisation of the categories contained in the system and analyse the single elements included therein.

Before describing the methodologies we adopted, we would like to give a brief overview of the criteria used for estimating production[3]. These criteria can be grouped into four categories:

a) criteria which foresee the direct gathering of costs and earnings from balance sheets and administrative documents. This data is complete and is not underdeclared; it refers to activities of large-size enterprises, public enterprises and public administration institutions;

b) criteria which foresee the aggregation of estimates relating to quantity of output and relative prices; these criteria are used for estimating the activities of the agricultural and construction sectors as well as the branch of energetic products;

c) criteria which foresee the expansion of per capita values for labour units, after having estimated the overall labour underlying the product and after having corrected the per capita values for eventual undervaluations;

d) criteria which estimate the product, by means of information concerning the utilisation; these criteria are usually adopted to estimate the activity carried out by the so-called "invisible" units or by very small units which want to stay hidden and therefore do not regularly register their product.

These criteria clearly show the fundamental role played by employment in methods which estimate the product from the point of view of formation; as a result the Italian accountants designed a methodology enabling them to identify and analyse the various segments of regular and irregular economy within the labour market, by choosing a disaggregation level by economic activity and by territory, which optimises results.

The per capita values have moreover been controlled and revaluations are carried out in order to avoid the phenomenon of underdeclaration by entrepreneurs.

It may be noted that, in order to estimate the created product, Italian accountants consider the following to be the major aspects of underground economy: the utilisation of irregular labour within the productive process and underdeclaration of the product obtained by means of regular labour.

As far as other branches of economic activity are concerned, particularly those in which the proportion realised by very small units is highly important, direct sample surveys were carried out with the aim of uncovering aspects of irregular and underground economy.

The whole range of the above described methodologies enabled us to integrate the underground activities with the data which

[3] A detailed description may be found in "Nuova contabilità nazionale" and in "Inventario delle procedure e delle basi statistiche utilizzate per il calcolo del PNL e dei suoi componenti". See note 2.

makes up the statistical base used to estimate the various economic and financial flows which describe the different phases of the income circuit.

Finally, the account balancing has made the system coherent, and in addition it uncovered other activities not symmetrically registered.

In other terms, we may formalise what has been said in the following way:

$$Y = \sum_{b=1}^{m} \sum_{c=1}^{4} X_{bc} \cdot u_{bc} + \sum_{b=m+1}^{44} Y_b$$

where:

b = indicator of branch of economic activity (44)
c = indicator of class of firm based on size
y = total value added
x = mean value added
u = labour unit
$\sum_{b=m+1}^{44}$ = part of the value added not measured via labour units

2.3 The following chapters will analyse in greater detail the single criteria used for estimating underground production. In particular the following aspects will be discussed: the estimate of irregular segments within the labour market, the revaluation of underdeclared production, surveys carried out in order to investigate sectors which are particularly inclined to hide their economic activity and, finally, balancing techniques.

2.4 Before going into greater depth on the eswtimates of the irregular segments of labour, it appears necessary at this point to define and understand the ways in which the labour market is present in the country's economic system, and to highlight all the statistical problems which arise when an exhaustive and coherent description of reality is undertaken.

3. LABOUR MARKET ASPECTS - STATISTICAL PROBLEMS

3.1 In Italy in the late 1970s, researches carried out by experts and specialised organisations indicated a labour market split up into different heterogeneous realities (cottage industry labour, illegal immigrant labour, secondary activities) that may not easily be represented in a single category.

These realities cannot be easily identified and quantified, both because of the particular nature of the environment (extremely small businesses, individuals not having a fixed place of work, families that work at home on behalf of firms, etc.) and because economic subjects tend to hide their activities from the tax-authorities and from statistical institutes. It is for this reason that these activities are called *underground labour* or *undeclared labour*.

3.2 The National Institute of Statistics, well aware of these phenomena, has broadened the field of observation and has begun to devote particular attention to the way questions are set out on statistical questionnaires, as well as undertaking a more effective qualitative control of data gathered.

Only if data is more detailed, complete and of higher quality can national accountants use available statistical data to paint a precise picture of the complex segmentation of the labour market in all its activities, making use of all sources at its disposal to form a coherent picture, and creating methodologies to ensure, through systematic observation, that varying aspects of the economy are adequately represented.

3.3 If one looks at the actual situation and reads in greater detail the basic data, one is led to re-consider the concept of "employed". The "employed worker", taken to mean an individual that performs a working activity, no longer appears adequate to describe the complexity of the various categories of worker that co-exist in the labour market. These range from those who devote only a few hours, and not regularly, to productive activity, to those who perform a multitude of activities and devote their whole day to working, exceeding the "9 to 5" timetable which is dedicated to their principal occupation. It is clear that these "extreme" cases are both individuals, but their working contribution is, at least in terms of quantity, very different. In other words, it may be said that they are not homogeneous with regard to the factor of labour intensity. In a bid to measure correctly the level of employment belonging to the so-called underground economy, where the phenomena of secondary activities, work performed within invisible establishments and part-time work are most widespread, it is absolutely necessary for some concepts fundamental to the measurement of employment to be reviewed.

4. WORK VOLUME MEASUREMENTS - GENERAL PRINCIPLES

4.1 In national accounts statistics, the total number of "internal" workers includes all workers, both employees and self-employed, that perform a productive activity. Their number is expressed in the form of a "mean number" in a given period (quarterly or yearly) of persons that have taken part in the production process in a continuous form. In the calculation of this number, particular attention is paid to occasional or seasonal workers, especially when the average level of employment is measured on the basis of surveys that do not cover all the months of the period under observation.

The mean number of employed persons, both employees and self-employed, as defined by the ESA, undoubtedly represents the number of natural persons that participate in the production process in a continuous form. It does not however seem to consider fully the number of activities that each person may perform or, in other words, the working positions that a person may occupy.

4.2 As regards the actual economic situation in our country, the phenomena of occasional and marginal labour have been joined, to an increasing extent, by the element of the worker who, in the same period of time, performs more than one activity and therefore occupies more than one working position even in different branches of the economy. It is therefore believed that the definition of "worker" should be broadened. It is thus necessary to split up the worker-employment identity and rather take into account the number of activities or working positions that each person occupies in the production process.

From this alternative point of view, the quantity of work performed is represented by a group of working positions identified by the number of workers ("heads") only up to the point in which that position is the only or, at least, the main employment. Beyond this limit, the quantity of work is represented by the group of working positions consisting of a category defined as "second activity". The volume of work performed in the production process must also include that latter group.

This means that neither the number of "persons who work" nor the number of "working positions" may permit a satisfactory calculation of the volume of work that contributes to the production process. It follows therefore that a new concept and a new group needs to be introduced by national accounting authorities, which is the work volume expressed in "labour units". These units, characterised by the (approximate) parity of effort in the production processes of single economic activities, are obtained by reducing a series of so-called "working positions" to roughly homogeneous units. In detail, labour units are measured within the framework of each branch by bringing, through a coefficient of reduction, non-continuous and part-time working positions (main and secondary) up to the same quantity of labour as calculated for units occupied full-time.

This coefficient has been calculated as the ratio between the hours actually spent working by a part-time worker in any working position and the hours actually worked by a person declared as "employed" in the survey on labour forces for industry and services. As regards agriculture this ratio is calculated by using the number of days worked as an indicator.

Briefly, it may be said that in national accounts, employment is measured in terms of "labour units", which reduces to approximately homogeneous units an intermediate series (*obtained from various* sources and subject to duplications) that is called "working positions".

4.3 It should be pointed out that the most complete and correct measurement of the volume of work performed in a given period is to be obtained from the sum of all hours worked by employees and self-employed workers in any working position (main or secondary).

This may be true in theory, but when it comes to drawing up a methodology which encompasses all existing sources, some problems arise. The only global data relating to the number of hours worked is supplied by the survey on labour forces. But the problem with this data, according to analyses carried out, is that they are called into question owing to their "institutional" nature, namely the compiler of the questionnaire usually refers to the number of hours as laid down by contract instead of the actual mean number of working hours for the period in question. Secondly, this data is in any case available with a restricted analysis for only 12 branches of economic activity. Other statistical sources

dealing with working hours do not even cover global groups, which at least is the case for the aforesaid data. Surveys conducted at firms, such as the survey on the gross product, while grasping more precisely the nature of the "actual" number of working hours, limit the scope of their action to obtaining data for employees possessing working skills and, of course, to the economic activities included in the "field of observation" of the survey. Therefore, due to the lack of precision and/or the partial nature of statistical sources, it is not a good idea to express the volume of work in terms of "working hours".

Further problems crop up if it is recalled that in national accounting, the main purpose for measuring work volume, as well as providing an important measurement in its own right, is that of contributing towards the measurement of other economic aggregates, such as production, value added, employees' incomes, etc. Measuring work volume in terms of the number of hours worked would make it necessary to have basic data (taken from statistical surveys) expressed in terms of mean hourly values (e.g. productivity per hour), with which to bring these mean hourly values up to the whole population these mean hourly values via the product with the "total number of working hours" . An operation of this sort, as is well-known, is quite impossible from an operative viewpoint, because of the continued lack of information sources. Indeed, as well as not having satisfactory sources for the measurement of the "total number of working hours", no statistical survey currently offers the possibility of being able to measure accurately any "mean hourly value" whatsoever, since firms release economic data that refers to the whole labour force (e.g. the gross product of a company derives from the productive contribution of all employees), while working hour values refer only to blue collar workers. From these same surveys, however, the "mean values per employee" may be obtained, and only by using this data correctly it is possible to bring this date up to whole population values in order to measure economic aggregates for national accounts.

After this introduction to the problem, it is now important to spend a few words on the degree of accuracy achieved by using mean per capita values specifically for the measurement of an aggregate.

To use the mean per capita values "correctly", they need to be attributed to working positions that have been occupied for a working period which is on average of a duration equivalent to the average period for workers to whom the per capita value refers. If on the other hand these working positions have been occupied for a different period, the mean values must be corrected through a coefficient produced by the ratio between the actual working period of the person occupying the part-time working position and the actual period of the person occupying the working position in question (assuming that the mean value refers to the worker employed "full-time").

If the correction operation through this coefficient is applied, instead of the mean per capita value, to the number of working positions on which the mean per capita value is based, the final result of the measurement of the aggregate for national accounting purposes does not change, but a way would be found to express concisely and approximately the work volume. This operation, which carries all working positions to a full-time scale and produces the sum of these positions and the estimated coefficient, gives rise to what we have called "labour units". In this way, each working position may be worth one labour unit (if it involves a full-time employment) or a fraction of a labour unit (if it involves a main or secondary part-time activity).

It may be deduced that the total of all the first working positions coincides with the number of people employed, and it is likewise evident that the connection between employed persons and labour units is the following: one employed person equals one labour unit if he works full-time in one working position; he is worth a fraction of a labour unit if he works part-time in a single working position; he is worth one labour unit plus a fraction if he holds more than one working position of which one is full-time and one part-time.

The advantage of expressing the volume of work in this way and of measuring aggregates for national accounting purposes through mean per capita values instead of hourly values is obvious: instead of calculating the number of working hours throughout the economic system, it is sufficient to calculate an approximative coefficient to bring up to a full-time value only those working positions for which a working

period is below mean per capita values. At this point, statistical sources relating to actual working hours may prove to be sufficient. It is indeed no longer necessary for these sources to have to provide reliable, homogeneous, detailed and global data concerning the number of hours worked in all branches of economic activity by all workers; what is required is simply indications for the calculation of coefficients to be applied only to working positions having a working period other than that of statistically surveyed positions. In this respect, the reference units that are to be consulted do not need to be homogeneous: for example, for some branches the coefficient may be calculated according to data concerning working hours, since data is available on this, while for other branches (a typical case is agriculture), it may be based on the number of working days. For some working positions, the coefficient may be directly constructed on suppositions based on subjective judgments rather than on actual data. For example, with regard to "second activity" working hours, it is highly likely that time dedicated to the second job is no more than half that devoted to the main working position, etc.

The degree of imprecision and/or subjectiveness associated with this form of calculation of aggregates for national accounting purposes is in any case small, since it is limited to only a small percentage of working positions. For all other positions, indeed, the working hours implicitly contained in the obtained mean per capita value and used in national accounting estimates are to be considered as valid.

4.4 At this point it may be useful to give an example of what has been said so far, taking value added as the aggregate to be measured.

Value added for national accounting purposes (VA) relative to a single branch, as we have seen above, may be considered as the sum of two elements: the declared value added of firms and the estimated value added which completes the data supplied by the former.

Declared value added (VR_r), being declared by firms, concerns the employment declared by these, recorded in the payment books and therefore regular from legal, administrative and social security viewpoints; it may thus be defined as regular employment.

Estimated value added, on the other hand, is made up of a part pertaining to additional regular employment (VS_r) to complete the data obtained from firms, and another part pertaining to irregular employment (VS_n), undeclared labour, etc. We may formalise this in the following way:

$$VA = VR_r + VS_r + VS_n \qquad (1)$$

The three components may also be expressed as products of the working positions and the productivity relative to the single working position.

$$VA = vPR_r + zPS_r + yPS_n \qquad (2)$$

The mean productivity v may evidently be obtained from the ratio: $\frac{VR_r}{PR_r}$, but it may be divided into its elementary components:

$$V = \frac{VR}{OR_r}\frac{OR_r}{PR_r}PR_r\frac{1}{PR_r} \qquad (3)$$

where $\frac{VR_r}{PR_r}$ is the hourly productivity and $\frac{OR_r}{PR_r}$ is the number of hours worked by a person who regularly occupies a working position in statistically observed firms.

It appears evident from this formula that the productivity data implicitly contains the "information" relating to the actual number of working hours performed by those who regularly occupy a working position.

The mean productivity z, referring likewise to a regular employment in the same branch of the economy, may be assumed as equal to v, supposing the mean working hours of positions PS_r are equal to those of positions PR_r.

Ergo: $z = v$

For mean productivity y however, the same identity may not be assumed, since among the positions PS_n, there are some concerning working hours that are not the same as those of regular working positions. Productivity y should therefore be calculated as the ratio between the hourly productivity multiplied by the number of hours worked by those who occupy an "irregular" position and the number of irregular positions.

$$y = \frac{VR_r}{OR_r} OS_n \frac{1}{PS_n} \quad (4)$$

This formula can also be written in the following way:

$$y = v \frac{\frac{OS_n}{PS_n}}{\frac{OR_r}{PR_r}} \quad (5)$$

where the term $\frac{\frac{OS_n}{PS_n}}{\frac{OR_r}{PR_r}}$ is the ratio beetween the actual number of working hours of those occupying an irregular working position and the actual number of hours worked by those occupying a regular working position. If we indicate this term by K, it is possible to re-write (2) in the following way:

$$VA = vPR_r + vPS_r + KvPS_n \quad (6)$$

in which it is clearly necessary to convert the irregular working positions through the element K so as to obtain a correct estimate of VA.

In reality, what distinguishes the per capita value added of the various occupational components of an economic branch is not of course only the duration of the working timetable but also the quality of work performed (including therein the professional content) and the unitary value of the goods and services produced. With reference to the above formalisation, it should be asked if it is correct to assume the per capita productivity "v" as being equal for all three components of employment, or rather, given that productivity "v" is applied to labour units KPS_n and not to working positions PS_n, if it is correct to assume the hourly productivity implicit in "v" as being equal for all components.

This problem obviously affects estimates of national accounting monetary aggregates and goes beyond those aspects regarding the measurement of work volume. It is however worth mentioning that, as will be seen later on, the volume of work, in its practical application, is sub-divided not only into occupational categories that have differing working periods (regular, irregular, undeclared workers, etc.), but also into classes of firm size based on the number of employees. Also, the irregular occupational components are all to be found among smaller-sized firms, considering that most "underground" activity is undertaken in these. This means that for every sector of the economy, there is not only one type of equation as for type (6); there are in fact as many as the classes of firm size, and that in measuring the value added of a branch using per capita values divided at least into firm size classes, it is possible to attribute to undeclared labour the mean productivity of smaller-sized firms, which usually proves to be the lowest among the various production units of a branch.

The reasoning followed up to this point is obviously valid for the calculation of other aggregates: for employees' incomes, for example, not only is it possible to assign the lowest per capita salaries of smaller-sized firms, but it is also possible to exclude some items that are certainly not paid with irregular work, such as social security contributions, etc., and so the labour costs of a branch are measured not only with a "v" which varies according to the size of the firm, but also within firms based on occupational activity segments.

Going back to the problems of the quantitative measurement of work volumes, we may observe that when applying the aforesaid general principles in practice, there are many full-time reducing coefficients, according to the branch and the single occupational segment.

Later we shall go on to look at how these coefficients have been obtained and used, and the various methodologies adopted for the measurement of labour units in different sectors will be specified.

Further considerations pertaining to the general theory and relative definitions have still to be developed.

5. DELIMITATION OF THE FIELD OF OBSERVATION

5.1 For national accounting, quantitative data on employment must necessarily be referable to production and all other aggregates relative to the various phases of distribution and use of income. This is so as to give meaning to the relationship between the result of economic activity of production

units and the group of human resources that has produced this result.

The field of observation covered by employment must therefore be the same as that of production as defined by the ESA, with regard to both territory and economic activity.

As far as territory is concerned, employment data includes all resident and non-resident workers that perform an activity at resident production units, that is units that have been for over a year of central interest to the country's economic territory. The concept of "internal" worker differs from the national concept normally used by labour statistics. Compared with national employment, "internal" employment also includes non-residents that work in resident production units and, to a lesser extent, residents working in non-resident production units.

Furthermore, as regards activity, the concept of production as understood for national accounting purposes excludes from the field of observation, and therefore from the measurement of employment: work performed by housewives, the work of the individual who performs ordinary maintenance work in his own home or constructs objects for his personal use; unpaid voluntary work undertaken as an expression of loyalty to ideals or solidarity towards certain categories of citizens. Illegal work, as mentioned previously, is a peripheral part of production, but is not included in estimates due to the difficulty of quantifying these items and relative production.

5.2 The statistical unit with which employment is observed is the local unit that represents a "proxy" of the homogeneous unit of production, an elementary unit defined by the ESA for input-output analyses.

5.3 The classification adopted to separate work performed by employees and the self-employed according to the Italian economic activities (ATECO) is the NACE-CLIO classification.

5.4 Finally, in order to correctly express the quantity of work applied to the creation of income, those workers that have not participated in the production process, because they have been laid off and placed under the care of the Cassa Integrazione Guadagni (CIG, that is wage supplementation fund) have been eliminated from the calculation.

6. STATISTICAL SOURCES FOR MEASURING EMPLOYMENT

6.1 Inventory of statistical sources

The most important statistical sources available for measuring employment are:

a) for labour supply flows, the number of workers obtained from:

- the population census (CP);
- the sample survey on labour forces;

b) for labour demand flows, the number of workers supplied by ISTAT and from external sources.

The ISTAT sources that have a bearing on labour demand are:

- the census for industry, trade, and crafts (CIC);
- the census for agriculture (CA);
- the survey on gross product;
- the survey on financial companies (loan and investment companies, trust companies and equity investment companies, investment fund companies);
- the survey on public and private hospitals;
- the survey on the whole range of state and private schools;
- the survey on scientific research;
- the survey on national and local welfare bodies, on national and local economic bodies, on research institutes and social security bodies;
- the survey on family expenditure for the ordinary and extraordinary maintenance of dwellings.

As regards labour demand, ISTAT data has been compared with the following external sources:

- ENEL (National Electricity Company), which supplies the number of its employees, distributed according to economic activity;
- The Transport Ministry, which supplies the number of employees of the State Railways and of railway licensees;
- Post Office, Telecommunications and telephone service companies, State Monopolies and the RAI (Public Broadcasting Company), which supply the number of their employees according to economic activity;
- CISPEL, which supplies the number of employees of local authority utility companies according to economic

activity (electricity, gas, water, transport, etc.);
- The Ministry of the Interior, which supplies the number of employees belonging to the Provinces and Municipalities, as well as information on the number of foreigners present;
- The Health Ministry, which supplies the number of employees working in local health authorities;
- The Treasury Ministry (General Accountancy for the State), which supplies the number of public sector employees;
- The Finance Ministry, which supplies the number of VAT registration numbers;
- The Bank of Italy, which supplies the number of its employees and those of the Italian Exchange Rate Office, as well as those of state-held credit institutes, other credit firms and relative central institutes, and of Institutes and sections for special credit;
- ANIA, which supplies the number of employees of insurance companies;
- SCAU, which supplies the number of workers and the number of working days performed in agricultural holdings.

6.2 Critical analysis of principal sources

The principal sources of information for measuring employment are taken to be the data obtained from the three censuses (population; industry, trade, services and crafts; agriculture) plus the data obtained from the survey on labour forces.

Each source has its own specific capacity of representing the differing areas of a labour market that presents the above-mentioned features.

Briefly, sources from the supply side:
- have no "physical limits" when it comes to identifying the employment, in that data is gathered from the person's home;
- can count the only or principal working positions, but do not count the second or third working positions [4];
- may however uncover irregular dependent labour, as the compiler of the questionnaire is less interested in hiding his activity;
- do not consider foreign workers entering the country on a daily basis, as they are overseas residents, but on the other hand include residents who perform their activity in non-resident units;
- encompass all economic activities, but the distribution of workers in differing activities is probably unreliable, at least as regards employee-based occupation.

On the other hand, sources from the demand side:
- obviously encompass only the economic activities included in that survey's field of observation (thus the CIC does not included most agricultural activity nor several service activities) [5];
- encompass only that part of employment which is identified through the local unit in which the person works;
- consequently do not include those workers, usually self-employed, who perform their activity in their own home, namely those workers who do not have a fixed link with a resident local unit;
- on the other hand are able to provide a measurement of the second activity of self-employed workers, if in every firm the holder of the working position is recorded;

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[4] Even when a specific question is posed to people who occupy a second working position, like in the survey on labour forces, the number of replies appears incomplete and unreliable.

[5] In the field of observation of the industrial and trade census of 1981, the following classes or sub-classes or categories of economic activity were not included:
(a) in the branch of Agriculture, the sub-classes 011 (Agriculture) and 012 (Zootechnics); the categories 0131 (specialised holdings for the selection and incubation of eggs of hens and other birds), 0133 (specialised holdings for the selection and breeding of other kinds of animals) and 0201 (forestry holdings);
(b) in the branch of Public Administration and public and private Services, part of category 9121 (all services under the control of the General Administrative Office for detention and punishment Institutes); category 9122 (judicial psychiatric hospitals); sub-classes 913 (National security and public order), 914 (National Fire Brigade Service), 915 (National defence), 935 (Professional professors and teachers), 955 Professional activities of self-employed paramedics), 966 (Religious organisations) and 976 (Artistic and literary professions), categories 9784 (Professional activities of self-employed sportsmen) and 9794 (Self-employed teachers of recreational activities), sub-class 985 (Domestic services for families and cohabitations), class 99 (Diplomatic corps, international and supra-national organisations and allied armed forces).

- identify the occupation of the firm's employees as registered in the wages books, which are therefore regularised;
- are not able to include extra activity within the firm since, in all probability, this activity is not regularised or recorded in wages books;
- supply a reliable classification of workers according to economic activity, since the compiler of the questionnaire is the owner of the business or a person within the organisation or within the administration of the firm.

The variety of information sources as regards employment brings up the question of the existence of profoundly differing concepts and relative empirical aggregates.

Sources that gather information from the labour supply side (CP and family sample surveys) lead to a calculation of the number of employed persons, and each person is counted only in relation to his single or principal working activity.

Statistical sources on the labour demand side (that is surveys in which businesses are interviewed) appear to count the number of employed persons, but in reality they indicate the number of working positions existing in firms, or rather the positions that they wish to declare.

Theoretically, in census-type surveys, the two different types of data (employed persons and working positions) might coincide, assuming the field of observation and the date the censuses were carried out were the same, only if each person has a single working position, if this position is regular (that is the labour contract is regulated in accordance with the relative norms in force, so that the firm is not interested in hiding information) and if the working position may be referable to a physical location (the firm's premises, plant, local unit, etc.). If the single position condition is not respected (some people perform second activities), the number of working positions is greater than the number of employed persons. If however labour contracts are not all regular and if some activities are not performed in identifiable places (for example cottage industry work), the number of persons proves to be higher than the number of working positions declared by the firm.

By comparing census data, it is therefore theoretically possible to single out three components of employment:

1) persons in possession of a regular labour contract represented by those who in population censuses declare themselves to be employed, which is confirmed numerically by the number of working positions revealed by censuses undertaken at firms;

2) persons performing irregular work, represented by declared employed workers in the CP exceeding the number of working positions declared by businesses;

3) second activities resulting from the excess of working positions, obtained from censuses carried out at firms, compared with the number of persons who declared themselves to be employed in the CP.

In addition to these components, others need to be considered to get a better idea of the phenomena relating to the labour market.

First of all, there are varying degrees of irregularity as regards the working relationship, and by comparing data from the demographic census with that from firm-based censuses, it is possible to show up that part of irregular activity for which compilers of the questionnaire consider themselves in every respect full-time workers.

Along with these, however, there are workers who do not consider themselves as such, but rather as housewives, students, pensioners, etc., even though they have worked a certain number of hours; there are moreover illegal immigrant workers whose "degree of irregularity" is such (in all senses) that they "refuse to answer" any statistical survey in an attempt to hide their very presence in the country. It should then be considered that second activity working positions shown up through a comparison of census data are revealed only if they are performed within fixed physical locations that may be identified by compilers of firm-based censuses, and they should in any case be included to take into account all activities performed with "different modalities" (e.g. small commercial agencies, professional consultancy, repairs and maintenance of dwellings, the road transport of persons and goods, etc.).

It should be emphasised therefore that none of these statistical surveys permits an exact measurement of one or the other aggregate (employed persons or working positions). In particular, censuses and periodical surveys, such as the quarterly surveys, count the number of workers or working positions at a given moment, but in all

probability they do not fully reveal the incidence in the labour market of fluctuating masses of occasional and seasonal workers.

What has been illustrated up to this point at a theoretical level implicitly contains the course of all the methodological steps followed to measure the mean yearly work volume in 1981 in terms of labour units. This may be summed up in the following phases:

a) preliminary standardisation of principal sources, so as to render them coherent and comparable, and in compliance with national accounting definitions;

b) integration and correction of principal sources, so as to eliminate or reduce to a minimum faults in data, limitations due to the different fields of observation and the likely errors inherent to each of these sources;

c) quantification of working positions in reference to the three segments of employment that may be identified by comparing principal sources (regular, irregular and second activities), once the minimum level of classifications has been fixed for territorial and sectorial analyses;

d) measurement of the positions referring to the segment of undeclared workers;

e) integrative estimate of second activity positions for activities not carried out in easily identifiable fixed locations, by means of censuses of companies and local units;

f) estimate of coefficients to bring data pertaining to part-time positions up to full-time scale, and calculation of labour units;

g) data taken as a yearly average so as to eliminate seasonal phenomena implicit in principal sources;

h) estimate of number of labour units corresponding to the hours of CIG (wage supplementation fund) payments, and their deduction from the total number of labour units, so as to arrive at an estimate of the volume of work that has gone to produce the gross domestic product.

PART II

MEASURING THE QUANTITY OF WORK

7. OPERATIONS ON PRINCIPAL SOURCES

7.1 Standardisation with national accounting definitions

The phenomenon "employment" was interpreted by unifying and standardising all sources within a coherent framework. It was firstly necessary to refer data obtained from the principal information sources back to the concepts, definitions and field of observation of national accounting, and then to ensure the same degree of coverage for the phenomenon under observation. From a temporal point of view, the three main sources used, namely the industrial and trade census, demographic census and sample survey on labour forces, did not need to be standardised since they all referred to October 1981, and so the data pertaining to each of these sources was processed in accordance with the criteria as laid out below.

As far as the *population census* (CP) is concerned, employed persons identified in the area of residence were firstly classified according to the rank in their profession and the economic activity of the industrial business, agricultural holding, shop, office or body at which they performed their working activity. Then each person was identified in relation to the place of work. This operation transformed resident employment into "present" employment and thus eliminated persons employed overseas. The results of this operation are contained in Table 1.

Table 1 - Employed persons in the 1981 Population Census

Regions	Employed persons				
	Residents	that work in other regions	that work overseas	that come from other regions	Presents
PIEMONTE	1,778,385	29,099	9,640	30,990	1,770,636
VALLE D'AOSTA	43,879	1,647	147	2,024	44,109
LOMBARDIA	3,585,616	30,324	40,416	85,149	3,600,025
TRENTINO A.A	331,771	4,345	3,531	7,777	331,672
VENETO	1,639,703	31,095	10,335	21,740	1,620,013
FRIULI-V.G.	459,064	7,779	3,510	17,822	465,597
LIGURIA	615,491	14,081	6,806	24,887	619,491
EMILIA ROMAGNA	1,658,673	23,405	2,993	34,009	1,666,284
TOSCANA	1,365,929	20,087	3,818	21,757	1,363,781
UMBRIA	290,930	10,857	1,088	5,044	284,029
MARCHE	547,191	12,312	2,099	8,371	541,151
LAZIO	1,614,130	20,832	5,922	38,623	1,625,999
ABRUZZI	390,465	14,599	6,112	7,551	377,305
MOLISE	104,237	4,062	3,997	3,719	99,897
CAMPANIA	1,381,775	37,400	24,337	11,317	1,331,355
PUGLIA	1,087,353	24,747	16,982	7,553	1,053,177
BASILICATA	178,339	8,986	9,279	6,474	166,548
CALABRIA	522,459	21,091	24,238	5,567	482,697
SICILIA	1,194,767	22,990	23,956	4,787	1,152,608
SARDEGNA	433,394	8,284	4,565	2,861	423,406
ITALIA	**19,223,551**	**348,022**	**203,771**	**348,022**	**19,019,780**

This shows that in October 1981, Italian workers that undertook their activity in non-resident units were 204,000 circa, and the number of workers that moved from their regions of residence to work in other regions, without changing their registered address, was 348,000 circa.

In order to standardise the number of employed persons as identified in the CP with the concept of "internal employment" as defined by the ESA, persons employed in diplomatic services, international organisations and allied armed forces (as defined in the classification by ATECO of code 99.0) were removed, while conscripts and an estimate of non-resident or illegally present foreigners that performed their activity in resident units were included.

As is well-known, foreigners who perform a working activity in Italy are, on account of their characteristics, not included either in the CP nor in the survey on labour forces, and only marginally in the CIC. It was therefore necessary to estimate their numbers by using in part basic data and indications supplied by the Ministry of the Interior and also indirect indicators, such as the number of Italian carriers that perform a maritime transport service to other countries.

From this information it was possible to calculate the amount of employment among non-resident foreign workers performing activity in resident units for October 1981, that is 321,000 units. This figure was then distributed in the branches of agriculture, fishing, mechanical engineering, construction, repairs, commerce, hotels and restaurants, transport and domestic services, adopting a parameter based on information obtained from several researches conducted on the phenomenon, referred to in the general section.

Data from the survey on labour forces was standardised with CP data by adding the number of declared employed persons (that is excluding those who did not declare themselves as employed yet in another question replied that they had undertaken hours of work in the week of reference), the workers who lived in cohabitation, military conscripts and non-resident foreign workers.

Finally, as regards data on persons employed in local units obtained from the *Census on industry and trade* (CIC), the data on economic activities not included in the field of observation[6] was obtained by resorting to data contained in the CP for the corresponding ATECO's, and to information from social security Institutes regarding female domestic workers. By including the number of employed non-resident foreign workers and military conscripts, the CIC was also harmonised with the concept of "domestic occupied population".

7.2 Comparison of standardised data

The first overall comparison among data of the population census (CP), the census for Industry Trade and Crafts (CIC) and the Labour force Survey (FdL) (excluding non-resident foreign workers and persons who were not registered as employed although they had performed working hours) showed the differences between the sources, appearing separately for employees and self-employed workers (Table 2).

[6] Cf. note (5).

Table 2 - Comparison of basic data of main sources *(in thousands)*

Sectors	CP	FdL	CIC	CA
	EMPLOYEES			
Non Agricultural Sectors	A) Published data			
	14,560	14,752	12,247	–
	B) Comparable data			
	13,538	13,644	2,740	–
	FdL - CP = +106			
	FdL - CIC = +901			
	CP - CIC = +798			
Agricultural Sector	890	996	–	839
	FdL - CP = +106			
	FdL - CA = +157			
	CP - CA = + 51			
	SELF-EMPLOYED			
Non Agricultural Sectors	A) Published data			
	4,664	5,906	4,636	5,641
	B) Comparable data			
	3,538	4,076	4,609	–
	CIC - CP = +1,071			
	CIC - FdL = + 533			
	FdL - CP = + 538			
Agricultural Sector	1,417	1,702	–	5,766
	CA - CP = +4,349			
	CA - FdL = +4,064			
	FdL - CP = + 285			

It can be seen from this that the labour force survey revealed a larger number of employees and self-employed workers than the population census both in agricultural and non-agricultural sectors, whereas it revealed a fewer number of self-employed workers compared with the censuses conducted at firms (CIC, CA).

As mentioned above, the CP counted fewer workers than the labour force survey, but it revealed 798,000 more workers than the CIC in non-agricultural sectors and 51,000 more than the CA in the agricultural sector. In the same way as the labour force survey, it counted a fewer number of self-employed workers in all sectors of economic activity compared with censuses carried out at production units.

An analysis of the quality of census data, carried out on a sample of 2% of family survey sheets, showed that the error in responses concerning the position of the profession was minimum, which enabled the possibility of a significant classification error on account of this feature to be ruled out.

The comparison by ATECO also brought to light numerous positive and negative differences between the number of employed workers in the CP and the CIC.

From these first comparisons, it was deduced that on the whole, the labour force survey managed to reveal a greater quantity of employment compared with the CP by virtue of the interview technique employed, and that the classification according to economic activity of the CP was less accurate than the CIC.

These conclusions brought about two requirements:

a) to single out the regions in which the CP revealed a fewer number of employees and self-employed workers compared with that resulting from labour force surveys;

b) to correct CP data on economic activity, assuming that the ATECO's included in the CIC are less affected by errors since, as already pointed out, in the industrial census the interviewee was the owner of the firm and, in all likelihood, is expected to supply a less approximative answer than that given by the compilers of questionnaires for the population census [7].

[7] The classification error according to ATECO, due to the poor interpretation of the economic activity, may in any case be present in borh censuses.

7.3 Data integration at a geographical level

The regions in which the CP did not reveal the full amount of employment were identified by observing in which regions the frequencies of employees and self-employed workers included in the CP fell outside the confidence interval, with a confidence level equal to 95%, compared with the results of the labour force survey. The basic assumption is that the latter survey reveals a greater amount of employment more on account of its interview-based survey technique (that is due to the method with which the survey is conducted) than because of the sample nature of the technique. In the regions identified using the aforementioned criterion, frequencies were brought within the limits of the confidence interval, and so the number of workers included in the CP were brought up to a level compatible with numbers deriving from the labour force survey. This level was calculated also bearing in mind that from comparative analyses of regional data of the two surveys, it emerged that labour force data, in keeping with the nature of the survey, did not fully reveal the amount of employment present in the place of work, but continued to classify a part of it (about 20%) in the place of residence.

The integration of employees data for the CP concerned the regions of Campania, Calabria and Sicilia. The integration of data on self-employed workers affected all the regions of Italy, but only partially, that is only for household collaborators, in Friuli Venezia-Giulia, Emilia Romagna, Toscana and Marche. Modified data within each region was evenly distributed among all the ATECO's.

7.4 Correction of classification errors by economic activity

In order to apply the criteria as laid out in paragraph 6.2 for the identification of some occupational segments (regular, irregular and second activities) by comparing the main sources of data from the labour supply side with those from the demand side, it is necessary, apart from standardising these sources with national accounting definitions and integrating reciprocal data, to eliminate errors, at least the most probable errors, that may create numerical discrepancies when analysing and comparing the above-mentioned data.

There are two basic elements underlying the differences that emerge between sources from the demand side and sources from the supply side at the minimum level of analysis; one is due to the fact that two statistical surveys concerned with the same phenomenon (employment) may give a different measurement of the phenomenon, because both are subject to errors, and as a result, when the two are compared, "statistical discrepancies" are observed; the second is due to the fact that the two surveys, addressing different subjects (families and businesses) in order to measure the same phenomenon (employment), have the inherent capacity of observing different aspects, so that once that part of the phenomenon revealed by both surveys has been removed, namely "employment regularly entered in firms' wages books", residual elements may be interpreted as "statistical measurements" of particular phenomena (irregular employment, that is, not entered in wages books, and second activities). It is clear that in order to be able to quantify "precisely" these phenomena, it is necessary to try to eliminate the element of error, so as not to run the risk of falsely inflating these results.

The minimum levels of analysis should therefore be defined in relation to three aspects: the capacity of sources to "pin-point phenomena", the possibility of automatically compensating for errors due to the aggregation of data, the possibility of correcting errors that cannot be offset with the above-mentioned mechanism. After several experiments at very analytical levels, the levels which appeared most satisfactory were: three professional positions (employees, household collaborators, other self-employed workers), 20 regions and 674 categories of economic activity (ATECO), in accordance with the ISTAT classification.

Corrective measures in relation to the first two levels of analysis have already been dealt with.

With regard to the sectorial level of analysis (ATECO), it should be pointed out that, according to the considerations outlined in paragraph 6.2, corrections were necessary only regarding employees from family-based sources. As regards self-employed workers, it is probable that the same person answered the questions in the CIC and the CP and gave the same information as regards his/her own activity and that of the family collaborator.

Correction of the distribution of employment for employees according to ATECO based on the CP was carried out by grouping together the data from CP and CIC in 45 macro-filières (from the French word filière) classified by region and by single categories of economic activity. These filières were based on the basic raw material of a product or of a group of products, with a list of derived products: that is, all the products obtained from transformations of the raw material during the course of its economic life-cycle until it is transported and sold on the market.[8] The basic assumption is that economic activity classification errors, resulting from information given by individual workers in the CP, will in all probability remain within the same filière of production, thus nullifying the error.

In other words, it has been supposed that an employee might have classified himself in the CP in one of the following ways: a) correctly, in the same ATECO in which the employer has inserted him in the CIC; b) in an activity that is very similar and therefore may be confused with the exact activity; c) in another ATECO connected with the exact one, in those cases in which the production process of the firm for which the employee works is a long one and covers a vast range of ATECO's, from production of the raw material to its transformation, and commercialisation of the finished product.

In cases b) and c), the difference between the totals of data from the CP and CIC included in each segment should tend to zero. This result was in fact the case for almost all the 900 groupings (45 filières x 20 regions), even though there were significant discrepancies within each ATECO. By correcting the discrepancies between CP and CIC data so as to bring the former as close as possible to the latter (which, as has been said, probably gave a more reliable classification), one obtains a much smaller quantity of residual information, which may be

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[8] In the appendix, the ATECO codes included in each filière are listed, giving the reader o,terested in the argument the possibility of re-linking these codes to their economic contents by using the "Classification of economic activities" published by Istat in "Classificazione delle attività economiche", in "Metodi e Norme" - maggio 1981.

interpreted as measurements of particular segments of employment, as suggested in point 6.2. The criterion adopted for the approximation of data will be illustrated later, once some aspects pertaining to the grouping into filières of employment data have been dealt with.

Specific application of this method required two modifications which arose both from the nature of available elementary data and from the fact that in the CIC not all ATECO's were investigated. With regard to the nature of available elementary data, it is to be recalled that data does not represent the number of persons employed in the manufacturing process of a product, but rather the number of persons employed in the production process of an activity, which in some cases may involve more than one product. This means that an ATECO must be fragmented so as to be included in more than one segment.

In this case, the ATECO becomes a "pivot" variable which, being used to minimise the differences within the segment, assigns to each segment in which it is placed the same number of employees as that necessary to rectify classification errors.

With regard to the second point, it should be said that in order to correct CP classification errors present in agricultural activities and in foodstuff activities connected with it or at least linked to it in the production process, a number of agricultural employees had to be assigned to the CIC. In order to calculate this number, only a part of the CP data was taken into account, whose estimate was undertaken by assuming that if the CIC had investigated this economic activity, the corresponding number of employed workers would have registered the same mean deviation existing between the total number of workers revealed by the two censuses in the field of observation common to both (that is in all agricultural-foodstuff and manufacturing activities deriving directly or indirectly from agriculture).

It may safely be considered that if all the agricultural workers counted in the CP had been transferred to the CIC, then a part of the CP errors would also have been transferred, and it would have been impossible to correct errors using the filières.

In order to make this clearer, all the operations accomplished to correct CP classification errors within each region have been set forth as follows:

a) Within each segment, the differences between CP and CIC data have been calculated for each single ATECO;

b) Assuming CIC data is classified correctly, all negative differences (that is where the CIC data proved to be greater than the CP data) were brought to zero, taking employment away from those ATECO's in which differences were positive (CP > CIC) in proportion to the importance that these ATECO's had on the total amount of positive differences;

c) Corrected CP data was obtained by taking away from the basic CP the differences vis-à-vis the CIC, and adding to it the corrected differences.

The following frame gives an example of this procedure. In order to simplify matters, it is assumed that a segment is made up of just five ATECO's. Thus for the single region we will have:

CP DATA	CIC DATA	CP-CIC	CORRECTED DIFFERENCES	CP CORRECTED DATA
P_1	C_1	d_1	d'_1	$P'_1 = P_1-d_1 + d'_1$
P_2	C_2	d_2	d'_2	$P'_2 = P_2-d_2 + d'_2$
P_3	C_3	d_3	d'_3	$P'_3 = P_3-d_3 + d'_3$
P_4	C_4	d_4	d'_4	$P'_4 = P_4-d_4 + d'_4$
P_5	C_5	d_5	d'_5	$P'_5 = P_5-d_5 + d'_5$

Assuming that d_2 and d_4 are negative, namely $C_2>P_2$ and $C_4>P_4$ the values assumed by corrected differences will clearly be equal to zero if

$$\sum P = \sum C$$

since the positive differences will all be "absorbed" by the negative differences.
If however the sum of CP data is greater than CIC data ($\sum P>\sum C$), we will have:

$$d'_2 = 0;\ d'_4 = 0$$

and the general corrected positive difference will be given by:

$$d'_i = d_i - \left[\frac{d_i}{d_1+d_3+d_5}(|d_2|+|d_4|)\right]$$

that is, the ATECO 'i' will yield employment in proportion to the importance that its (positive) difference has on the total number of positive differences.

Finally, if the sum of CP data is less than CIC data ($\sum P<\sum C$), it is clearly not possible to eliminate the internal negative differences, and so:

$$d'_2 \neq 0; \qquad d'_4 \neq 0;$$

rather, the general corrected negative difference is given by:

$$-d'_j = d_j + \left[\frac{|d_j|}{|d2|+|d4|}(d_1+d_3+d_5)\right]$$

that is, the ATECO 'j' will absorb employment in proportion to the importance that the negative difference has on the total number of negative differences, and the corrected positive differences will all equal zero, with corresponding ATECO's having to yield all extra employment to carry negative differences to zero.
A concrete example of the procedure is illustrated in table 3, concerning the filière of milk, meat and derived products in the Emilia-Romagna region.

In column 1 are the ATECO codes included in the filière; it is to be observed that they involve breeding activities (from 0121 to 0140), related activities regarding the transformation of products in zootechnic holdings (from 0412 to 0437), industrial transformation activities (from 4121 to 4236), wholesale trade activities (from 6115 to 6179) and retail trade (from 6412 to 6546).

In columns 2 and 3 are CP and CIC data pertaining to these ATECO's (basic data).

In columns 4 and 5 appear the data pertaining to filières. They are either: equal to basic data; or less than basic data (according to previously mentioned criteria) since the ATECO's to which they refer are also included in other filières; or greater than basic data, in the case of the CIC for ATECO's from 0121 to 0140 which, not appearing in the field of observation of that census, have been integrated according to previously mentioned criteria.

In column 6 are the CP-CIC differences. In column 7 appear the results of the corrections of these differences, clearly showing the carrying of negative differences to zero and the proportional reduction of positive differences.

Finally, column 8 contains corrected CP data. It is clear that the overall CP value was not changed and that the whole operation served to render the internal differences in each segment between CP and CIC data as small as possible.

Table 3 - Correction of data pertaining to employee employment in the Population census in the filière of milk, meat and derived products in the Emilia-Romagna Region

Ateco	Basic CP Total	Basic CIC Total	CP in Filière	CIC in Filière	Differences in Filière	Corrected Differences	Corrected in Filière
1	2	3	4	5	6=4-5	7	8=4-6+7
0121	3,294	0	3,294	2,966	328	10	2,976
0122	1,231	0	1,231	1,109	122	4	1,113
0123	1,043	0	1,043	939	104	3	942
0124	275	0	275	247	28	1	248
0125	168	0	168	151	17	1	152
0126	183	0	183	165	18	1	166
0128	379	0	379	341	38	1	342
0131	273	0	273	246	27	1	247
0133	94	0	94	85	9	0	85
0140	101	0	101	91	10	0	91
0412	275	8	275	8	267	8	16
0413	653	107	653	107	546	17	124
0423	733	846	733	846	-113	0	846
0424	383	930	383	930	-547	0	930
0425	1,426	2,631	1,426	2,631	-1,205	0	2,631
0431	1,210	1,387	1,210	1,387	-177	0	1,387
0437	216	188	69	60	9	0	60
4121	2,144	1,904	2,144	1,904	240	7	1,911
4122	6,426	7,400	6,426	7,400	-974	0	7,400
4131	1,394	1,261	1,394	1,261	133	4	1,265
4132	1,847	1,048	1,847	1,048	799	24	1,072
4232	212	180	212	180	32	1	181
4236	120	89	35	26	9	0	26
6115	158	125	158	125	33	1	126
6172	1,313	1,529	1,313	1,529	-216	0	1,529
6173	731	1,131	731	1,131	-400	0	1,131
6179	1,751	2,543	297	416	-119	0	416
6412	267	122	267	122	145	4	126
6413	1,222	808	1,222	808	414	13	821
6414	351	34	351	34	317	10	44
6416	169	120	169	120	49	1	121
6417	1,911	1,309	292	200	92	3	203
6419	2,338	1,143	360	176	184	6	182
6423	305	103	51	17	34	1	18
6424	4,322	5,461	660	834	-174	0	834
6546	88	44	88	44	44	1	45
TOT.	**39,006**	**32,361**	**29,807**	**29,684**	**123**	**123**	**29,807**

The method described up to this point permitted the correction of CP data regarding the distribution of employees according to ATECO's, and this corrected distribution represented an indicator used to rectify data in the survey on labour forces, which was subject to the same errors observed in the CP. From a comparative analysis of data it was observed, for example, that there was an inflated number of workers revealed by the labour force survey in repair workshops to the detriment of the number of employees in mechanical industries,a greater number of workers in family services to the detriment of the number of workers in business services etc. This distortion was also borne in mind when adjusting estimates on regional employment, as mentioned above.

Having standardised data regarding both national accounting definitions and the degree of coverage of main sources and having corrected classification or errors by applying the "filière" method, data processing was then carried out, separating industry and service activities from agriculture.

8. DATA PROCESSING FOR MEASURING EMPLOYMENT IN THE INDUSTRY AND SERVICE SECTORS IN 1981

8.1 Comparison of data from main sources with data from other sources and their integration

The first operation performed in this phase of the work consisted of verifying the data contained in principal sources by comparing it with other specific sources, namely sources dealing specifically with single branches or sectors, made up of special surveys or of information obtained directly from vatious bodies.

These sources concern the following sectors:

- Tobacco industry (data from State Monopolies);
- Public and private health (ISTAT survey on public hospitals and private clinics);
- State and private teaching (ISTAT survey on the whole range of schools);
- Scientific research (ISTAT survey on scientific research);
- Credit (numerous sources covering the whole sector, as indicated below);
- Insurance (ANIA data);
- ENEL (National Electricity Company);
- State railways;
- Licensee railways (data from Transport Ministry);
- Post Office and Telecommunications (data from P.T.T. Ministry);
- Telephone services (SIP and A.S.S.T. telephone companies);
- RAI (Public Broadcasting Company)
- CISPEL (Italian association of local-authority public services) ;
- Public Administration (data concerning the number of employees of the various bodies contained therein).

By comparing data, it was possible to correct basic data where necessary, replacing incorrect data with that obtained from administrative sources and from companies. This was especially the case for the sectors of Public Administration, Credit and Insurance.

In the branch of Public Administration, the number of employees appearing in CP and CIC surveys was replaced, according to the single category of economic activity (ATECO), with the figure resulting from statistics drawn up by the Ministries for Treasury, for Interior and for Health, and by ISTAT surveys on public bodies. In addition, military conscripts were included among employees in accordance with ESA norms. Data was replaced since some analyses conducted at a regional level showed up several classification errors in CP data.

In the Credit and Insurance branches, comparative analyses pin-pointed classification errors between the data of these branches and credit intermediary and insurance data. It was therefore decided to establish the former by using data obtained from specific sources and to modify data where necessary when differences in ATECO's were observed by the above-mentioned intermediaries.

As regards the Credit sector, data was obtained from the Bank of Italy survey on credit firms and special credit Institutes, from the Bank of Italy's annual report, from direct contact with the Italian Exchange Rate Office, from balance reports of the "Mediocredito Centrale", "Artigiancassa" and from the ISTAT survey on financial companies.

As regards the Insurance sector, data was obtained from an ANIA survey regarding personnel in insurance companies.

Data was integrated and corrected at regional level separately for employees and self-employed workers. Integrations and corrections have not led to modifications in the totals pertaining to basic data, but only to changes in distribution according to the ATECO.

Below is the number of employees as revealed by the aforesaid specific sources, recalling that for some sectors the data was in line with data obtained from censuses.

8.2 Processing of standardised data

Once the main sources had been standardised, it was possible to go on to undertake a comparative analysis within each ATECO and region, separately for employees, household-collaborators and other self-employed workers. This analysis showed up any similarities or differences between data which, thanks to the work of standardisation and correction, no longer took on the aspect of statistical discrepancy but assumed economic significance.

In practice, the analysis showed up:

a) *regular workers* (that is, regularly entered in wages books), the workers in the CP that were the same as those in the CIC;

b) full-time *irregular workers* (that is workers not regularly or continuously entered in wages books, or 'cottage industry' workers): the workers in the CP that exceeded the number of workers in the CIC. It is to be pointed out that workers inserted into the CP as a result of the comparison with data in the labour force survey are also included in this segment (see point 4.3);

c) *secondary activities*, that is the working positions of the CIC which exceeded the number of those in the CP.

Table 4 - Number of employees resulting from specific sources *(in thousands)*

Sectors	Sources	Employees
Industry	Monopolies (Tobacco)	12
	Enel (Electricity)	120
Credit	B.I. etc.	311
Insurance	A.N.I.A.	45
Public Administration	Treasury, Interior, Health, Istat military conscripts	3,260
Transport and Comunication	Llicensee railways, bus and underground companies, P.T., S.I.P., A.S.S.T.	428
	RAI	14
	State Railways	208
Private educational and reserarch services	Private teaching	122
	Research institutes	18

The following were also identified:

d) persons not registered as employed but who performed hours of work as employees or self-employed workers, taking the labour force survey as the source. As is well-known, this survey supplies the number of these persons for only 12 branches of economic activity; therefore, these had to be distributed throughout the 674 ATECO's. This operation was performed by assuming initially that these persons were distributed in the ATECO's contained in each of the twelve branches surveyed in a similar way to the distribution of irregular workers. Subsequently, after having standardised the 674 ATECO's with the NACE-CLIO groups, some other transfers were performed, largely of minor significance and in any case without altering the basic data for the original twelve branches. These transfers were rendered necessary when the input-output table was adjusted in 1982;

e) non-resident foreigners who perform their activity in resident units, on the basis of data and information already mentioned in point 4.1.

These five segments, or working categories, formed the basis for subsequent processing. Once the various groups of working positions for work segments had been estimated, it was possible to re-compose the aggregates which combine best with the concepts and definitions illustrated in previous paragraphs and to quantify the volume of work in terms of "labour units".

This operation, as mentioned in paragraph 2.1, consists of the conversion to a full-time scale, by means of a coefficient of reduction, of working positions occupied for a period less than full-time. This operation therefore concerned all second activities and, first of all, those people who did not declare themselves as employed but who however undertook some hours of working activity.

The main source for measuring coefficients to convert part-time work to a full-time scale was the survey on labour forces. From this survey, in fact, it is possible to obtain separately, since it was directly surveyed, the number of working hours in the main or single activity, both for persons that declared themselves as employed and for others who declared their position to be another, as well as the number of hours worked in the possible secondary activity. So, comparing the number of hours declared by "non-employed persons with working hours" with those hours devoted to the principal or single activity worked by those persons who declared themselves as employed, it is possible to calculate a coefficient in order to convert the working positions of the former to a full-time scale. In the same way, by comparing the number of hours dedicated to a second activity by persons who admit the fact with the hours dedicated to the main or only activity of persons who declared themselves to be employed, a coefficient may be obtained to convert the secondary working positions to a full-time scale.

However, whereas for "undeclared workers" and for principal or single activities of declared workers, the relative working timetables are analysed according to position in the profession and economic activity (which in the survey, we recall, is analysed in only 12 branches), these details are not available as far as second activities are concerned, since the survey only asked questions about the existence of a second activity and the time devoted to it, without investigating into the branch or the professional position in which it is performed.

As regards the second activity, therefore, the coefficient adopted was the same for all ATECO's in industrial and service branches and for all professional positions, based only on average general indications which, essentially, brought about a reduction of second working positions by around 60% in order to obtain the corresponding labour units.

For undeclared workers, however, the coefficients are specific, according to professional position and branch, and are considered equal in all ATECO's that make up single branches of the twelve surveyed for the labour force survey.

It may be useful to provide an example with some numbers: from the survey on labour forces, it emerged that those who declared themselves as employees in the "transport and communication" branch work on average 38 hours per week, while those who, not declaring themselves as employed, said in response to another question that they had worked for 18 hours per week, that is for a working period which is 47% of that of an employed worker who considers himself/herself as such in every respect. The working positions of employees that do not declare themselves as being part of that

sector must therefore be reduced by 53% so as to be "worth" as much as those positions occupied full-time.

Thus, for example, the 8,157 unregistered workers calculated in ATECO 723 (road transport of goods), make up the equivalent of 3,864 labour units.

For self-employed workers, the coefficient is obviously different, being obtained from the ratio between the 25 hours worked on average by those who did not declare officially this professional position in the "Transport and communication" branch, and the 44 hours of those who consider themselves as employed in every respect; thus the 630 autonomous unregistered workers in the ATECO 723 sector make up 359 labour units, that is 43%.

The volume of work calculated for October 1981 was brought to the 1981 yearly average for each single work segment, using the corresponding variations between the annual mean and October 1981 data in order to remove seasonal factors, based on the survey on labour forces.

The calculated mean annual volume of work still did not represent the total volume, as it did not include, in terms of working units, the number of activities or working positions occupied as a secondary activity, or some particular activities performed in not easily visible operative units that may escape attention. It was therefore deemed necessary to bridge this gap in information, present to a large extent in the construction industry and in services, by using indirect indicators according to the methodology illustrated below.

8.3 Methodology adopted for estimating 'secondary activities' performed in particular branches of industry and services

(I) In order to estimate the number of second activities undertaken in the Construction industry, the expenditure borne by families for the ordinary and extraordinary maintenance of dwellings carried out by persons performing a second activity was taken into consideration.

The information was taken from the special survey conducted by ISTAT on this phenomenon with reference to 1985. These expenses, brought to 1981 values by means of an index on values obtained as the product of a quantity index (given by the variation in the average number of rooms of a house and by the variation in the level of maintenance undertaken by families) and a price index (given by the variation in the cost of construction of a residential building) represented the revenue produced.

The per capita revenue of construction companies, having a workforce of from 6 to 9 units, was then taken from the survey on small-sized firms, conducted by ISTAT in 1983. This per capita revenue was then brought to 1981 values via the index for the cost of construction of a residential building (assuming constant productivity) and was relieved of some costs, such as social security contributions and general expenditure (legal, trade union costs, etc.) which are not believed to be borne by those who perform a second activity and whose incidence may be valued at around 13% of the per capita revenue according to the same survey.

By dividing the revenue produced by those who perform a second activity by the presumed per capita revenue the number of labour units was estimated, subsequently converted into the number of working positions occupied by self-employed workers as a second activity.

(II) To estimate the number of second activities performed in the branch of Hotels and Restaurants, the total demand was taken into consideration, made up of the expenditure, in terms of final internal consumption, borne by families for the services of this branch, and of the intermediate consumption of businesses, taken from the 1980 input-output table (brought to 1981 values with the variation in GDP, assuming a constant coefficient over the two years between this aggregate and the intermediate costs borne by businesses for these services).

This data was considered as the total revenue of the branch. The revenue of small-sized firms was calculated by deducting from the total revenue, as defined, the revenue of firms having more than 20 employees. The revenue per employee in small-sized firms was then calculated (obtaining this value from the 1983 survey on small-sized firms, brought to 1981 values with the variation in value added per employee in the same branch, as it appears in the old series of national

accounts)[9], followed by the revenue per employee of firms having more than 20 employees. By comparing the revenue of small, medium and large-sized firms with their relative per capita revenues, the corresponding number of labour units was obtained. The total proved to be greater than the number of labour units calculated previously with the general methodology applied to other branches by around 509,000 units.

This procedure may be outlined as follows:

D = Total demand
D_g = Revenue of firms with 20 or more employees (survey on gross product)
D_p = D - Dg Revenue of firms with fewer than 20 employees
P_p = Revenue per employee in firms with fewer than 20 employees (survey on gross product of small-sized firms)
P_g = Revenue per employee in firms with 20 or more employees (current survey on gross product)
A_p = D_p / P_p Labour units in small-sized firms
A_g = D_g / P_g Labour units in firms with 20 or more employees
U = Labour units previously estimated (resulting less than $A_p + A_g$ by 509,000 units).

This number of labour units to be added to the total appeared rather unreliable, or at least needed to be verified. So the total revenue, calculated as we have seen from the demand side, was compared with the figure that would be obtained from the supply side, by considering the product of per capita revenue of small, medium and large-sized firms for respective labour units that had previously been estimated. The estimated total revenue proved to be less than the revenue obtained from the demand side to the tune of 11,000 billion lire.

As the amount of estimated revenue from the total demand side was considered as reliable, it was assumed that both the revenue and the number of labour units on the supply side were under-estimated. In the absence of direct or indirect information on relative under-estimations, it was supposed that both were under-estimated by a proportionally identical factor. This assumption led to the final estimate of second activities in terms of labour units, as illustrated below.

Formalising what has been said thus far, and picking up the symbols used previously:

a) The previously estimated labour units U are made up of the two quantities:

U_p = Labour units in firms with 1 to 19 employees
U_g = Labour units in firms with 20 or more employees

b) The total demand "D" is, in theory, composed of

$$D = (P_pU_p) + (P_gU_g)$$

In reality, the estimate $(P_pU_p) + (P_gU_g)$ is less than the total demand "D", believed to be reliable, for which reason both the per capita (P_p, P_g) and the number of labour units U_p, U_g are considered as under-estimated.

In order to obtain equal values, a correction factor K is applied, rectifying both per capita and labour unit values.

$$D = (KP_p\ KU_p) + (KP_g\ KU_g)$$
$$D = (K^2P_pU_p) + (K^2P_gU_g)$$
$$D = K^2[(P_pU_p) + (P_gU_g)]$$

$$K = \sqrt{\frac{D}{(P_pU_p) + (P_gU_g)}}$$

therefore the K factor must be applied to the estimated labour units "U" to obtain the integration needed to reach a quantity of labour input congruent with production "D", given the mean productivities KP_p and KP_g.

The labour units will thus be $U_f = KU$, of which the quantity $U_f - U$ like second activity workers.

(III) An estimate of second activities in the branch of "Internal transport" was carried out by assuming that there was at least one driver for every vehicle in circulation and at least two persons for every trailer truck or semi-trailer truck.

Information on vehicles in circulation were taken from the ANFIA (a national transport sector association), thought to be a more exhaustive source compared with census data. The division between means of goods transport used for one's own activity and those used on behalf of third parties was performed on the basis of CIC data.

The number of vehicles in circulation for the transport of persons and for the transport

[9] Resorting to the old series of national accounts could not be avoided, since at this stage of the work, the data from the series was still not available.

of goods on behalf of third parties was compared with the working positions resulting from previous surveys. This comparison enabled us to observe an under-estimation of second working positions for employees and self-employed workers, in units that performed services for the transport of both persons and goods. The distribution of employees and self-employed workers in working positions that emerged from the new calculation was carried out in proportion to the working positions already surveyed in the branch.

(IV) After having carried out the modifications to data as described in the three previous points both in terms of "labour units" and working positions, the total number of working positions of self-employed categories in the strict sense of the word (employers, self-employed workers and qualified professionals) was compared with the number of VAT registrations.

When the latter proved to be greater in number, the difference constituted the sum of the newly-calculated number of second working positions occupied by self-employed workers in the strict sense of the word. This was the case in the following branches: wholesale trade, retail trade, transport, company services, medical market services and recreational and cultural services.

It was assumed that the number of VAT registrations provided a satisfactory value of the total number of working positions occupied by self-employed workers, bearing in mind that the opening of a VAT register brings about numerous advantages (for example the declaration of costs for tax purposes, the possibility of stipulating leasing contracts, etc.), especially important for persons whose primary activity is performed as employees.

(V) A calculation of the number of second activity workers performing domestic services should also be included. The overall number of working positions, calculated according to the general methodology previously illustrated, was compared with the data regarding those persons registered with social security Institutes. The difference between the calculated figures and the number of registered persons was attributed to the number of second activity workers.

The following are the results of the above-mentioned estimates on second working positions.

Secondary activity data *(in thousands)*

	Positions			
	Employees	Self-employed	Total	Labour Units
Building and construction	—	87	87	35
Lodging anda catering	440	110	550	220
Transport	184	80	264	106
Other services	—	475	475	190
Domestic services	185	—	185	74

This section concludes with a brief summary of operations performed to calculate the level of employment in various segments.

Definition of working positions

Positions	Sources
Regular	CP = CIC
Irregular	CP and FdL > CIC
Unregistered workers	FdL
Irregular and unregistered foreign workers	Ministry of Interior and University
Second working positions	CIC > CP and FdL estimates VAT registration numbers Social security registrations

8.4 Aggregated data

Having performed the specific calculations for the various sectors of industry and services, as in the previous point 8.3, the total number of working positions for 1981 was calculated. Numbers obtained were then divided according to the various classes of firm based on size: 1-9 employees; 10-19; 20-49; 50+.

The set-up of firms as described in the CIC was taken as the basis for the division of firms. A sub-division of labour units according to the economic activity of local units and to the size of firms was thus obtained. This two-fold classification is the most functional for the purposes of calculating GDP and other national accounting aggregates for which the surveys on the gross product of businesses (the annual survey on firms with 20 or more employees and the periodical survey on small-sized firms) are used as main sources. In the classes from 1 to 19 employees, the number of regular workers is integrated with the number of irregular workers (that is those who perform working hours but are not registered as employed), non-resident foreigners and second activity workers, estimated using the aforementioned processes.

8.5 Considerations on the classification by economic activity

Estimates of labour units were carried out for 674 categories of economic activity, in accordance with the ISTAT classification used in the censuses. These categories of economic activity were then standardised with the NACE-CLIO classification.

It should be pointed out that when undertaking the aforesaid re-classification for NACE-CLIO branches, repair workshops for goods (excluding the repair of consumer goods and vehicles) were not classified among market services, whereas before the revision they had been calculated in the industrial sector. This re-classification operation, implemented in order to comply with the ESA classification, brought about the transfer of 149,000 labour units circa from the branch of "recovery and repair services", included in market services, to the branches of mechanical industry.

9. DATA PROCESSING FOR MEASURING EMPLOYMENT IN THE AGRICULTURAL SECTOR

The particular nature of the agricultural sector and the partial diversity of sources used made it necessary to process agricultural data separately.

Occupation pertaining to employees was first considered. By virtue of a comparative analysis between data from the Census of agriculture (CA), the SCAU and the CIC, from the labour demand side, and CP data integrated with the data from the survey on labour forces corrected with the filière method (see points 4.3 and 4.4) from the labour supply side, the following results emerged:

a) to consider as regular employees those who receive a fixed salary and whose contract provides for over 180 working days per year, as contained in the CA and the SCAU;

b) to consider farm labourers and rural day labourers as irregular employees, with data taken from the difference between the total number of agricultural employees resulting from the integrated and corrected CP and the number of regular workers as defined above;

c) to quantify, on the basis of the survey on labour forces, the number of persons that are not registered as employed, but who have admitted performing working hours in the agricultural sector.

d) to estimate, according to above-mentioned criteria (see point 4.1), the number of non-resident foreigners who undertake their working activity in agriculture.

A total of about 1 million primary working positions was calculated.

The corresponding labour units were estimated by reducing the total number of primary working positions by means of a coefficient of reduction which was taken to be equal to the ratio between the mean number of days worked by part-time employees and the mean number of days (200) worked by regular employees. Data was taken from the CA and from the SCAU which, observing the phenomenon from the demand side, tended to express more the regular than the irregular aspects of labour.

This feature made it necessary to control the degree of reliability of the coefficient of reduction by analysing for each region and among various regions the degree of deviation between the number of labour units estimated according to the above mentioned criteria and the number of working positions indicated by the integrated and corrected CP, considering the fact that the degree of irregular work varied considerably from region to region.

From this comparison, it emerged that in the regions of the centre-north of the country, the variation between the estimated number of labour units and the number of working positions is minimal, whereas in southern regions, estimated labour units proved to be considerably fewer than the number of working positions occupied by employees.

According to specialised studies on the matter and to sociological analyses, it did not appear that this variation could be justified by a greater presence of irregular workers and of undeclared farm recruitment (the so-called corporates) in these regions than elsewhere. because along with this phenomenon there is also the supposed phenomenon of workers who intend only to take advantage of special treatment for unemployment and other benefits.

These considerations led to the conclusion that CA data on working days gathered in these regions was not very reliable.

As it was however impossible to find an alternative indicator, even indirect, for the measurement of working days performed per year by irregular workers in these regions, it was decided to calculate directly the number of "labour units". This was calculated by taking the medium value situated between the minimum number, that is the estimated number of labour units as above, and the maximum value, represented by the working positions resulting from the integrated and corrected CP.

By putting together the estimates from all regions, a total number of 876,000 employee labour units was obtained (159,000 fewer compared with previous estimates of employment).

The next step was to estimate self-employed employment.

The agriculture census revealed about 5,700,000 persons that worked independently, performing on average 83 working days per year. In the same census, those working over 180 days per year in the agricultural holding were considered as regular self-employed workers, which was the case for a little more than a million people (a figure that is confirmed by corrected CP data, but not if compared with the survey on labour forces). The number of irregular workers, estimated at 374,000 units, was calculated by taking the difference between the total number of self-employed workers resulting from the integrated and corrected CP and the number of regular workers as estimated above. Then, on the basis of the labour force survey, the number of those not registered as employed, but who performed working hours, was calculated and taken to be 272,000.

This meant a total number of natural persons (heads) occupied in the agricultural sector of 1,687,000 persons circa.

The difference between the total number of agricultural working positions revealed by

the CA and the number of individuals (heads), namely those who performed their primary or single activity in agriculture, revealed the number of second working positions of self-employed workers present in the sector, which came to 4 million circa.

The "working positions" were then converted to "labour units" by means of a coefficient of reduction, taken to be the ratio between the total number of working days performed in the agricultural sector, as indicated in the CA, and the mean number of working days performed by an agricultural worker on a full-time basis, assumed to be 280 in accordance with European Community norms.

The number of self-employed labour units performing work in agriculture was estimated to be 1,970,000 (350,000 units more than the previous national accounting estimates).

10. COMPARISON OF 1987 REVISION ESTIMATES WITH PREVIOUS NATIONAL ACCOUNTING DATA

Standardisation of different sources, taken from the demand side and from the supply side, an overall evaluation of the volume of work in 1981 was obtained, which was 6.6% above previous estimates. The volume of work performed by employees was up by 3.0% and that regarding self-employed workers by 15.8% (Cf. Table 5).

Table 5 - Labour units by sector of economic activity and position in the profession, according to new and previous estimates. Year 1981 *(in thousands)*

Sectors	Position in the profession								
	Employee			Self-employed			Total		
	New estimates	Old estimates	Difference %	New estimates	Old estimates	Difference %	New estimates	Old estimates	Difference %
Agriculture	876	1,035	-15.3	1,970	1,620	+21.6	2,846	2,655	+7.2
Industry	6,657	6,470	+2.9	1,353	1,062	+27.4	8,010	7,532	+6.3
– industry (not including construction)	5,346	4,995	+7.0	832	767	+8.5	6,178	5,762	+7.2
– building and construction	1,311	1,475	-11.1	521	295	+76.6	1,832	1,770	+3.5
Market services	4,314	3,907	+10.4	3,436	3,154	+8.9	7,750	7,061	9.8
Not-market services	3,734	3,712	+0.6	-	-	-	3,734	3,712	+0.6
Total	**15,581**	**15,124**	**+3.0**	**6,759**	**5,836**	**+15.8**	**22,340**	**20,960**	**+6.6**

As regards single sectors of the economy, the new estimates for employment in national accounting data brought about the following variations compared with previous estimates:

- in agriculture, the volume of work went up by 7.2% overall, which is the result of a 15.3% reduction in work performed by employees and an increase in the volume of work carried out by self-employed workers of 21.6%;
- in industry (not including con-struction), an overall increase of 7.2% in work volume was registered, due to a 7.0% rise in the work volume for employees and an 8.5% rise for self-employed workers;
- in the building and construction industry, the overall rise in work volume was 3.5%, made up of an 11.1% drop in work performed by employees and a rise of 76.6% in work performed by self-employed workers;
- in market services, there was an overall rise of 9.8%, due to a rise in volume for both employees and self-employed workers of 10.4% and 8.9% respectively;
- in non market services, there was a 0.6% rise in work volume, due entirely to work performed by employees.

The data on employment, expressed in terms of working positions and labour units, classified according to the condition (regular, irregular work, etc.) and position in the profession (employee or self-employed), is illustrated in Tables 6-9, showing overall totals and the figures for the three main sectors of activity.

Table 6 - Working positions and labour units by condition and position in the profession. Total Economy. Year 1981 *(in thousands)*

Condition	Position in the profession		
	employee	self-employed	total
Working positions			
1. Principal or single activities			
1.1 Regular workers	13,234	4,445	17,679
1.2 Irregular workers	1,575	1,018	2,593
1.3 Unregistered workers	318	438	756
1.4 Non-resident foreigners	321	-	321
Total of domestic workers	**15,448**	**5,901**	**21,349**
2. Secondary activities			
2.1 Second job	846	5,590 [10]	6,436 [10]
3. Total	**16,294**	**11,491**	**27,785**
Labour units			
1. Regular	13,234	4,445	17,679
2. Irregular [11]	1,438	907	2,345
3. Unregistered workers	249	288	537
4. Non-resident foreigners	321	-	321
5. Second job	338	1,120	1,458
Total including CIG (wage supplementation fund)	**15,580**	**6,760**	**22,340**
Total not including CIG	**15,301**	**6,760**	**22,061**

[10] Including 4,002 in agriculture.
[11] The reduction in the number of irregular workers is due to the influence of workers in agriculture.

Table 7 - Working positions and labour units by condition and position in the profession. Agriculture. Year 1981 *(in thousands)*

Condition	Position in the profession		
	employee	self-employed	total
Working positions			
1. Principal or single activities			
1.1 Regular workers	211	1,041	1,252
1.2 Irregular workers	724	374	1,098
1.3 Unregistered workers	46	272	318
1.4 Non-resident foreigners	41	-	41
Total of domestic workers	**1,022**	**1,687**	**2,709**
2. Secondary activities			
2.1 Second job	-	4,002	4,002
3. Total	**1,022**	**5,689**	**6,711**
Labour units			
1. Regular	211	1,041	1,252
2. Irregular	587	263	850
3. Unregistered workers	37	181	218
4. Non-resident foreigners	41	-	41
5. Second job	-	485	485
Total including CIG (wage supplementation fund)	**876**	**1,970**	**2,846**
Total not including CIG	**875**	**1,970**	**2,845**

Table 8 - Working positions and labour units by condition and position in the profession. Industry. Year 1981 *(in thousands)*

Condition	Position in the profession		
	employee	self-employed	total
Working positions			
1. Principal or single activities			
1.1 Regular workers	5,924	955	6,879
1.2 Irregular workers	608	233	841
1.3 Unregistered workers	102	38	140
1.4 Non-resident foreigners	38	-	38
Total of domestic workers	**6,672**	**1,226**	**7,898**
2. Secondary activities			
2.1 Second job	-	354	354
3. Total	**6,672**	**1,580**	**8,252**
Labour units			
1. Regular	5,924	955	6,879
2. Irregular	608	233	841
3. Unregistered workers	86	25	111
4. Non-resident foreigners	38	-	38
5. Second job	-	141	141
Total including CIG (wage supplementation fund)	**6,656**	**1,354**	**8,010**
Total not including CIG	**6,380**	**1,354**	**7,734**

Table 9 - Working positions and labour units by condition and position in the profession. Services. Year 1981 *(in thousands)*

Condition	Position in the profession		
	employee	self-employed	total
Working positions			
1. Principal or single activities			
1.1 Regular workers	7,099	2,449	9,548
1.2 Irregular workers	243	411	654
1.3 Unregistered workers	170	128	298
1.4 Non-resident foreigners	242	-	242
Total of domestic workers	**7,754**	**2,988**	**10,742**
2. Secondary activities			
2.1 Second job	846	1,234	2,080
3. Total	**8,600**	**4,222**	**12,822**
Labour units			
1. Regular	7,099	2,449	9,548
2. Irregular	243	411	654
3. Unregistered workers	126	82	208
4. Non-resident foreigners	242	-	242
5. Second job	338	494	832
Total including CIG (wage supplementation fund)	**8,048**	**3,436**	**11,484**
Total not including CIG	**8,046**	**3,436**	**44,482**

11. ESTIMATES OF LABOUR UNITS BENEFITING *CASSA INTEGRAZIONE GUADAGNI* (Wage Supplementation Fund)

The data obtained up to this point can now be compared with the old-style national accounting data, and it is correctly used for applying added values obtained with the survey on the gross product of firms to the economy as a whole.

However, in order to calculate correctly the volume of work applied to the creation of GDP so as to be able to quantify productivity with a higher degree of accuracy, the number of workers that are laid off work and receive wage supplementation fund (Cassa Integrazione Guadagni, CIG), and consequently have not played a part in the production process, should be omitted from data. Before outlining the methodology adopted for estimating the number of workers benefiting from the "CIG", it is important to make some considerations about the basic data used for this purpose. In particular, it is necessary to distinguish between employees made redundant at productive firms and those from firms that have been wound up. The former tend to remain included among the personnel of the firm, which does not consider workers to have been dismissed. It is therefore supposed that they are classified as employed in both the CP and the labour force survey. The latter however do not appear in statistical sources. It is indeed logical for a bankrupt firm not to compile statistical surveys and it may therefore be surmised that the worker in this type of firm is not registered as employed in the CP and in the labour force survey, even if he benefits from the CIG.

The procedure for estimating the number of labour units in CIG is based on the data pertaining to the number of hours of CIG as published by the National Institute of Social Security (INPS).

INPS calculates the number of hours by adding together the hours authorised by the Employment Ministry to firms that request this sort of benefit. For each company, the number of authorised hours (CIG_t) is obtained from the product of the number of employees (L) benefiting from the provision by the number of weeks of validity (S) and by the number of working hours per week as envisaged by specific work contracts (H). With reference to time (t), we may create the formula:

$$CIG_t = \sum_{t=1}^{n} [L_{ti}\, S_{ti}\, H_{ti}]$$

where the number from 1 to n is the number of models with which CIG hours are authorised (during a year, and in compliance with the law, the single firm may therefore present different models referring to various sub-periods).

By way of example, if a company makes 4 requests for the payment of wage supplementation fund to 1 employee having a contractual timetable of 40 hours per week for a period of 3 months (13 weeks), the number of authorised hours is calculated as:

$$\sum_{i=1}^{H} (1 \times 13 \times 40) = 2.080$$

In this case, therefore, a total of 2,080 hours are counted for one labour unit in CIG for one year.

Another important aspect that needs to be considered is that for ordinary and extraordinary CIG there is a considerable distance in time between the actual placement in CIG and when these CIG hours are authorised, which is due to bureaucratic delays that are calculated at two months for ordinary CIG and 6 months for extraordinary CIG.

Bearing these particular aspects in mind, the number of workers in CIG is estimated by dividing the number of authorised hours, regarding active firms only for the period of reference, by the product between the number of weeks of CIG in a year and the number of working hours per week as indicated in the contracts of different sectors.

12. RE-CONSTRUCTION OF HISTORICAL SERIES

12.1 General criteria

The numbers of working positions and labour units for 1980 and the period 1982-86 were estimated by assigning to the estimated data for 1981 (based on census information and according to the method described in previous points) the percentage changes on the previous year affecting the corresponding features of the phenomenon, estimated from statistical data obtained from current surveys

and specific sources from both the labour demand side and the labour supply side.

In order to adopt this method, it was first of all necessary to create new data banks concerning the measurement of employment from both the labour demand and labour supply sides. This was to comply with two essential requirements:

a) to keep information on single labour market segments (regular, irregular, unregistered workers, non-resident foreigners, second work) classified according to the position in the profession (employees, household collaborators, entrepreneurs and self-employed professionals), the economic activity of the local unit and the size of the firm represented by the local unit (1-9; 10-19; 20-49; 50+);

b) to be able to calculate those indicators used to observe the evolution and structural variations of single sub-aggregates over set periods of time.

12.2 Statistical sources

The main sources used for calculating data on the number of workers from the labour demand side were:

- the survey on the gross product of firms;
- the survey on employment in firms with more than 10 employees, available for the years 1983 to 1985, and the survey on employment in industrial plants, the first of which conducted in 1987, referring to 1986;
- the 1983 sample survey on the gross product of small-sized firms; this survey will be conducted every three years (the 1985 survey is being drawn up);
- the survey on the set-up of agricultural holdings conducted by Istat for the European Community in 1982 and 1985 (three- yearly);
- specific sources already described for 1981 (see section 6).

The main sources for calculating data on the number of workers from the labour supply side, was the sample survey on labour forces.

These sources provide the number of workers classified according to the "ATECO" of the firm, if the size of firm is in one of the classes: 1-9, 10-19, 20-49, and according to the "ATECO" of the functional unit if the firm employs 50 or more workers. Since this basic data was used to estimate the variations in census data on labour which, as has already been written, is classified according to the "ATECO" of the local unit, it was necessary to assume that in companies employing fewer than 50 workers, the ATECO of local units was identical to that of the firm, and that in large-sized firms (+50 workers) the functional units corresponded to local units or a group of local units, and therefore the ATECO was identical.

This assumption may be eliminated in the next few years when data becomes available on employment levels in single industrial plants and if, of course, this data is deemed to be quantitatively and qualitatively valid.

This assumption however necessitates the use of analytical data for each single economic activity.

12.3 Methodology

As we saw in previously mentioned concepts, demand side sources provide information on single or principal regular working positions and on secondary activities. The sectors covered by these sources are: agriculture and related activities, all industrial activities, consumer good repair workshops, the activities of commerce, lodging and catering, transport, communications, credit and insurance, some company service activities, some activities of non-market services and Public Administration activities.

Within each sector, sources usually refer to firms that employ 10 or more workers. It is only possible to measure indicators that refer to the whole range of companies for establishments whose data is provided by specific sources and for agricultural activities subjected to surveys on the set-up of that sector.

For small-sized firms (less than 10 employees), the number of workers per single ATECO was calculated as follows: in 1983, on the basis of information gained from the survey on small-sized firms in the sectors of industry and services; in 1982, as an intermediate value between the two points estimated for 1981 and 1983; in other years, by extrapolating values from these fixed points.

From the information obtained from production units or estimated, it is possible to create a year by year series of change

indexes on the previous years, in the number of working positions according to the position in the profession, the ATECO and the size of firm, which can be compared with a similar matrix prepared from census data, which refers to regular employment in the single or principal working position and to secondary activities.

In other words, this matrix gives an indication for each position in the profession of the variation coefficients from year to year in the number of working positions by ATECO and the size of firm.

Starting from a basic matrix of unitary coefficients, the series is built up in stages through the adding of as many matrices as the number of information sources from the demand side. Information is added by superimposing in the basic matrix those variation coefficients obtained from statistical sources that guarantee a higher quality of information.

By way of example, for the same firm size and the same ATECO, the coefficient of variation calculated from data deriving from the survey on the gross product of firms is deemed to be more reliable than that from the survey on employment in firms employing 10 or more workers, since the data is controlled within a framework of aggregates that must be statistically and economically coherent.

For branches not covered by surveys, the variation index (provisionally assigned to the relative cells of the matrix) for 1980 and 1982 is equal to the unit compared with 1981 ; for the years after 1983, the index of variation attributed to relative cells has been estimated by extrapolating the data pertaining to previous years according to criteria that will be illustrated hereafter.

Information obtained from the survey on labour forces concerning the number of registered workers gives an indication of the number of natural persons or single or principal working positions occupied regularly and irregularly, classified according to the position in the profession and according to the twelve branches of economic activity.

From this data, it is possible to estimate, for each position in the profession and for each branch, change indexes on previous year (calculated from 5-term annual averages) for the whole range of the two labour market segments under study.

The coefficient matrix constructed from labour demand side information is used to estimate from year to year the data referring to regular workers and second working positions as indicated in the CIC, whereas the matrix of coefficients constructed from labour supply information is used to estimate the data pertaining to regular and irregular workers resulting from the CP.

By juxtaposing the matrices of variation indices constructed from both labour demand side and labour supply side surveys, it is possible to quantify the distance separating the two indicators for each set of classification features.

It is assumed that the indicator constructed from labour supply information is more reliable.

The difference in values (if there is a difference) is then distributed among irregular and regular workers for the firm size 1-19 (assuming information from the survey on gross product for firms having plus of 20 employees is reliable); if no information is available for constructing an index from the demand side, the difference is distributed among irregular workers for all firm sizes.

Having thus estimated for each year, via the above-mentioned method, the historical series of regular and irregular single or principal working positions and of secondary working positions, classified according to position in the profession, ATECO, and size of firm, other labour market segments were then evaluated (unregistered persons performing working hours and non-resident foreigners), in accordance with the same criteria already described for 1981.

From particular data for the branches of Construction, Lodging and Catering and Inland Transport, and a comparison of estimated working positions with the number of VAT registrations, it was possible to calculate the number of secondary working positions.

After having estimated for each year the working positions in each labour market segment, classified according to position in the profession and for the 44 branches of the NACE-CLIO classification, the number of labour units was calculated from data on working positions.

This procedure, carried out using the same criteria adopted for 1981, initially involved irregular workers in the sector of agriculture,

those persons not registered as employed but who performed working hours, and finally those occupying a second working position.

Once other national accounting aggregates had been estimated (value added, employees' incomes, etc.), those workers benefiting from the wage supplementation fund were deducted from the number of labour units, and part-time workers were brought up to a full-time scale, including regular part-time workers present since 1984.

PART III

OTHER ESTIMATES

13. REVALUATION OF UNDERDECLARED INCOME

As we have already pointed out, the second major aspect of underground economy is the underdeclaration of output obtained by means of regular labour, generally present in accounting documents of small enterprises.

An underdeclaration of the income produced can be assumed if the hourly pay of the self-employed worker is lower than the one of the employee who, given the same amount of working hours, operates in the same activity sector.

Should this be the case, the original data, relating to the value of production and income, is rectified by means of a procedure based on the Franz method. This procedure, which is carried out by subclass of economic activity and by employee-number class, is divided into the following phases:

a) the per capita earnings of employees (managers, white and blue collars) is revaluated on the basis of the same working hours of self-employed workers (entrepreneurs and household collaborators);

b) for each firm the net income is calculated (by subtracting the employees' earnings, the passive interests, bank expenses, fixed capital amortizations, renting and insurance expenses from the gross earnings) thus calculating the per capita net earnings of self-employed workers;

c) if the per capita earnings of self-employed workers is lower than the one of employees, the latter is then attributed to self-employed workers.

Table 10 shows the coefficients used to adjust the data pertaining to small enterprises by branch of economic activity, from 1983 to 1989.

It is interesting to note that the number of corrective actions performed for the different branches has fallen sharply also due to the new, more efficient measures applied against tax evasion, and particularly the one foreseeing the mandatory use of cash registers in all shops.

This method, as can be easily understood, considers tax evasion to be the main cause of anomalies found in the behaviour of the entrepreneurs. Even though this principle holds true in the case of strong growth, it appears to be less so when the economic cycle is undergoing a decline; in the latter case the production function should be structured in a way enabling the behaviour of the operator and the underlying causes to be more efficiently analysed. These aspects are the object of the research projects which are being carried out in order to improve information for the 1992 benchmark.

Table 10 - Revaluation coefficients of Gross Product for firms with less than 20 workers.

Branches	1983	1985	1986	1987	1988	1989
Agricultural, forestry and fishery products	5.1	5.9	6.0	3.8	3.1	3.7
Ferrous and non-ferrous ores and metals	6.8	3.1	5.5	3.6	4.0	2.3
Non-metallic mineral products	6.6	5.8	8.3	4.8	3.6	3.2
Chemical and pharmaceutical products	2.9	4.0	4.0	2.8	2.1	1.6
Metal products except mach. and transp. equipm.	9.2	5.1	5.3	3.4	2.7	2.5
Agricultural and industrial machinery	6.6	5.8	3.9	2.5	2.4	2.1
Office and data process. machines; precis. and optic. instr.	6.7	3.5	4.0	2.8	3.2	1.8
Electrical goods	3.7	4.5	4.1	2.6	2.5	2.1
Motor vehicles	8.6	5.4	6.1	5.1	3.8	2.5
Other transport equipment	10.8	7.9	11.4	6.5	6.0	3.7
Meats, meat prep. and preserv., other prod. from slaughtered animals	7.4	9.4	4.4	3.3	3.7	4.3
Milk and dairy products	5.7	6.2	5.4	3.8	5.2	2.6
Other food products	8.3	7.3	8.1	3.9	4.5	4.2
Beverages (alcoh. and non-alcoh.)	8.0	11.1	4.7	5.3	3.9	2.8
Textiles and clothing	7.3	5.0	6.4	4.1	4.0	3.5
Leathers, leather and skin goods, footwear	5.0	4.4	5.5	5.5	5.0	3.2
Timber, wooden products and furniture	11.8	7.1	9.9	6.9	5.3	4.7
Paper and printing products	7.0	3.4	3.7	2.5	2.8	2.8
Rubber and plastic products	5.2	5.0	4.1	2.8	2.9	2.3
Other manufacturing products	7.1	5.0	5.8	3.1	2.9	2.4
Building and construction	7.3	5.6	8.7	5.1	4.1	3.4
Recovery and repair service	19.8	6.9	17.1	7.0	12.4	4.2
Wholesale and retail trade	14.9	7.2	9.3	4.7	6.4	3.6
Lodging and catering services	30.1	9.7	21.8	7.3	11.0	5.2
Inland transport services	21.9	10.5	17.2	6.0	10.1	6.4
Maritime and air transport services	7.2	4.6	6.6	6.0	8.1	3.4
Auxiliary transport services	15.8	8.5	12.4	6.5	9.4	5.6
Communication services	42.4	3.7	12.5	3.5	8.4	3.2
Business services provided to enterprises	15.9	-	15.9	-	11.6	-

14. SAMPLE SURVEYS CARRIED OUT ON FAMILIES AND ENTERPRISES

(I) Some operating units which are not "visible", or units characterised by a small number of workers, tend to hide part or all of their activities, being facilitated by the scarcity of general controls and by the possibility of avoiding statistical surveys. The data gathered on the side of supply and income formation do not generally cover the total product created, even though they are integrated with the revaluated activity of irregular sectors of the market.

For these activities, the product estimate is therefore independent of the underlying quantity of labour and is instead obtained by means of data on family expenditure, gathered in "ad hoc" surveys, and by integrating this data with data from other sources. The underlying hypothesis is that families have no interest in hiding data.

Phenomena which are observed in "ad hoc" sample surveys represent family expenditure for:

- holidays;
- meals in restaurants, food and beverages;
- household maintenance.

The results of surveys on holidays and restaurant meals, food and beverages, adequately integrated with expenditure of foreign tourists in lodging and catering facilities, enable us to estimate the product of the "Lodging and catering services" branch.

The results of the survey on ordinary and extraordinary maintenance of households which, as we have already seen, has also drawn attention to secondary activities, was aimed at completing the evaluation of the product of the construction industry.

Finally, the product of the construction branch has been completed in order to uncover another part of underground economy, i.e. illegal construction. This activity, which cannot be identified by means of surveys on "building licences" issued by City Councils, was identified by comparing data from the latter survey with Census data.

(II) The surveys described above enable us to quantify the overall product of different branches, but cannot help us to identify the proportion of underground economy pertaining to the product. These proportions can only be estimated "ex post", using as direct indicators the estimates relating to irregular employment which have been considered above.

15. ACCOUNT BALANCING

The balancing method adopted by Italian accountants permits the integration between flow estimates of sectorial interdependence tables (available in benchmark years) and current estimates of national economic accounts.

This method is based on an adaptation of the Stone, Champernawne, Meade (1942) method. It is a procedure which integrates a manual, error-correction approach with a more sophisticated approach which enables the correction of unbalances highlighted in the accounting system, by distributing discrepancies between various aggregates forming part of the accounts, according to the degree of reliability. The latter can be expressed as the variance of direct estimates of each component of the system (value added, intermediate consumption, etc.).

This method, used in the rebalancing process, not only corrects statistical errors, but can also show proportions of products which the techniques analysed so far have not been able to show. These are usually proportions of product recorded under the "utilisation" heading, but not under the "formation" one.

APPENDIX

Regrouping of economic activity groups (ATECO 1981) into 45 macro-filières

1. Cereals, zootechnics

0111, 0119, 0415, 0434, 0436, 4162, 4220, 6111, 6112, 6423

2. Cereals, bread, pasta, cakes and pastries

0111, 0119, 0433, 4161, 4170, 4180, 4191, 4192, 4193, 4211, 4212, 4231, 4233, 4234, 4235, 4961, 6176, 6178, 6179, 6370, 6417, 6418, 6419, 6423, 6424, 6620, 8135

3. Sugar

0112, 0119, 0429, 4200, 4961, 6178, 6179, 6417, 6419, 6424

4. Fruit and vegetables

0112, 0115, 0116, 0119, 0414, 0426, 0437, 0439, 4140, 4236, 6171, 6179, 6411, 6417, 6419, 6423, 6424, 7230

5. Wine

0113, 0119, 0416, 0417, 0427, 0428, 4235, 4251, 4252, 4961, 6179, 6370, 6417, 6419, 6424

6. Alcoholic, non-alcoholic beverages, beer and water

0119, 0418, 0432, 4241, 4242, 4243, 4270, 4281, 4282, 4961, 6175, 6179, 6370, 6417, 6419, 6421, 6424, 8132

7. Vegetable oils

0114, 0119, 0411, 0421, 0422, 4111, 4112, 4113, 6174, 6179, 6417, 6419, 6421, 6424

8. Tobacco

0119, 0438, 4291, 4292, 6119, 6178, 6422

9. Milk and meat

0121, 0122, 0123, 0124, 0125, 0126, 0128, 0131, 0133, 0140, 0412, 0413, 0423, 0424, 0425, 0431, 0437, 4121, 4122, 4131, 4132, 4232, 4236, 6115, 6172, 6173, 6179, 6412, 6413, 6414, 6416, 6417, 6419, 6423, 6424, 6546

10. Fish

0311, 0312, 0321, 0322, 0435, 0437, 4150, 4235, 4236, 6177, 6179, 6415, 6417, 6419, 6423, 6424

11. Plants and flowers

0117, 0118, 6114, 6179, 6417, 6419, 6424, 6545

12. Wood

0201, 0202, 0203, 4610, 4620, 4631, 4632, 4633, 4640, 4651, 4652, 4653, 4661, 4662, 4663, 4671, 4672, 4674, 4830, 6131, 6151, 6159, 6178, 6179, 6197, 6330, 6350, 6380, 6390, 6481, 6485, 6487, 6561, 6562, 7230, 8460, 8470

13. Leathers, leather and skin goods, footwear

4410, 4421, 4422, 4511, 4512, 4520, 4812, 4830, 6117, 6161, 6166, 6167, 6197, 6380, 6390, 6457, 6461, 6462, 6487, 6561, 6562, 6720

14. Metal products for consumption

3136, 3161, 3162, 3163, 3165, 3166, 3167, 3168, 3191, 3288, 3433, 6534

15. Metal-working

2110, 2120, 2210, 2221, 2222, 2230, 2241, 2242, 2330, 3111, 3112, 3121, 3122, 3123, 3131, 3132, 3133, 3134, 3135, 3136,

3141, 3142, 3162, 3191, 3285, 3286, 3289, 3454, 5012, 6123, 6124, 6125, 6152, 6486

16. Construction and installation of plants

1630, 3111, 3136, 3150, 3282, 3283, 3288, 3289, 3611, 3711, 5012, 5013

17. Industrial machinery and equipment

0441, 0442, 0450, 3134, 3136, 3161, 3162, 3191, 3192, 3210, 3221, 3222, 3230, 3241, 3242, 3243, 3244, 3251, 3252, 3253, 3271, 3272, 3273, 3274, 3284, 3285, 3287, 3288, 3301, 3433, 3434, 3481, 3713, 5012, 5031, 6141, 6142, 6143, 6145, 6146, 6340, 6486, 6547, 6711, 7230, 7250, 8410, 8420, 8460, 8470

18. Motor vehicles and aircraft

3261, 3262, 3431, 3481, 3510, 3520, 3530, 3631, 3632, 3640, 3650, 4820, 6147, 6210, 6511, 6512, 6513, 6711, 6712, 6713, 7230, 7500, 7610, 7641, 7642, 8440, 8450

19. Boats and trains

3136, 3281, 3420, 3482, 3611, 3612, 3613, 3621, 3622, 3712, 6514, 6660, 7101, 7102, 7103, 7210, 7220, 7300, 7410, 7420, 7621, 7622, 7631, 7632, 7710, 7721, 7722, 7731, 7732

20. Precision instruments

2591, 3283, 3288, 3301, 3441, 3443, 3454, 3481, 3483, 3711, 3712, 3713, 3714, 3721, 3722, 3731, 3732, 3733, 3734, 3740, 4911, 4912, 4920, 4931, 4932, 4933, 6182, 6193, 6194, 6441, 6541, 6542, 6740, 6750, 7230, 8460, 8470, 9831, 9832

21. Electric household appliances

3164, 3289, 3451, 3452, 3454, 3460, 3470, 3483, 4920, 4941, 5031, 6153, 6154, 6155, 6483, 6484, 6493, 6730, 6750, 7230

22. Electric and electronic products

1610, 3136, 3191, 3288, 3289, 3301, 3302, 3410, 3420, 3432, 3433, 3434, 3441, 3442, 3453, 3454, 3481, 3482, 5031, 5032, 6144, 7230, 8131, 8132, 8133, 8430

23. Building and construction materials

1701, 1702, 2311, 2312, 2313, 2314, 2315, 2391, 2392, 2393, 2410, 2421, 2422, 2423, 2431, 2432, 2433, 2434, 2440, 2451, 2452, 2453, 2460, 2471, 2472, 2473, 2474, 2475, 2481, 2482, 2483, 2484, 4830, 5011, 5021, 5022, 5040, 6132, 6133, 6134, 6156, 6197, 6380, 6390, 6482, 6487, 6492, 6561, 6562, 7230, 8135, 8330, 8340

24. Hydrocarbon

1110, 1200, 1310, 1320, 1330, 1340, 1401, 1402, 1403, 1500, 1621, 1622, 2511, 2515, 5021, 5022, 6121, 6122, 6320, 6520, 6548, 7230, 7240, 8135

25. Chemical products

2320, 2511, 2512, 2513, 2514, 2516, 2517, 2518, 2519, 2550, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2570, 2581, 2582, 2592, 2593, 2600, 4811, 4962, 6113, 6126, 6157, 6181, 6183, 6184, 6430, 6442, 6443, 6444, 6547, 8135, 8372

26. Articles of fur

4560, 6118, 6162, 6310, 6457

27. Textiles and Clothing

0132, 2600, 4311, 4312, 4313, 4314, 4315, 4321, 4322, 4323, 4331, 4332, 4341, 4342, 4343, 4344, 4351, 4352, 4353, 4361, 4362, 4363, 4370, 4381, 4382, 4391, 4392, 4393, 4394, 4395, 4396, 4397, 4398, 4399, 4531, 4532, 4533, 4534, 4535, 4536, 4537, 4538, 4539, 4541, 4542, 4551, 4552, 4673, 4830, 4942, 4943, 6116, 6161, 6163, 6164, 6165, 6168, 6179, 6195, 6196, 6197, 6360, 6380, 6390, 6451, 6452, 6453, 6454, 6455,

6456, 6471, 6472, 6487, 6543, 6544, 6549, 6561, 6562, 8460, 8470

28. Paper and printing products

4710, 4720, 4731, 4732, 4733, 4734, 4740, 6158, 6191, 6192, 6197, 6220, 6380, 6390, 6487, 6491, 6531, 6532, 6533, 6561, 6562, 8396, 8397

29. Other miscellaneous products (gadgets, fancy goods, objects d'art, etc.)

4950, 6197, 6380, 6390, 6487, 6494, 6495, 6535, 6550, 6561, 6562

30. Lodging and catering

6610, 6620, 6651, 6640, 6652, 6653, 6671, 6672, 6673, 6674, 9113, 9670, 9791, 9822

31. Credit

8110, 8121, 8122, 8131, 8132, 8133, 8134, 8135, 8310

32. Insurance

8210, 8220, 8230, 8320, 8350

33. Business services

5011, 8350, 8360, 8371, 8381, 8382, 8391, 8392, 8393, 8394, 8395, 8398, 8399, 9112, 9113, 9230, 9402

34. Personal services

9212, 9360, 9781, 9783, 9784, 9810, 9821, 9822, 9841, 9842

35. State education

9311, 9321, 9322, 9323, 9331, 9341, 9771

36. Private education

9312, 9324, 9325, 9326, 9332, 9342, 9772

37. Public health services

9511, 9512, 9513, 9514, 9515, 9521,9522, 9523, 9524, 9525, 9561

38. Private health services

9516, 9517, 9518, 9519, 9526, 9527, 9528, 9529, 9531, 9532, 9540, 9562

39. Central administration

9111, 9112, 9121, 9122, 9130, 9140, 9150

40. National and local authorities

9113, 9190, 9211, 9220, 9611, 9621, 9631, 9782

41. Private assistance

9612, 9622, 9660

42. Post and telecommunications

7901, 7902, 7903

43. Various social institutions

9632, 9640, 9651, 9652, 9680

44. Public broadcasting

9741, 9742

45. Entertainment

9720, 9730, 9750, 9792, 9793

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