

**Official Statistics in Italy**  
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# ITALIAN OFFICIAL STATISTICS IN TRANSITION

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Paolo Garonna – *Director General of ISTAT*

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The 49th Session of the International Statistical Institute is a suitable occasion for the presentation of an outline of the evolution of official statistics in Italy and its role in a period of great change such as that which the country is going through in the 1990's.

A session of the Conference on the topic "Issues in Italian Official Statistics", organized by Istat, took place in Florence on August 1993. This volume gathers together the main contributions presented on that occasion.

Just as with the economy and society, official statistics has gone through, and is still going through, a period of rapid change which started in the early 1980s. During that decade, social and economic trends were emerging which brought forward the conditions of the crisis and the profound transformation under way. Indications as to the direction of change were also emerging. The shift, in Italy, has been from a basically "rigid" society, divided by ideological barriers, territorial differences, institutional inflexibility and low social mobility, to a society which is becoming more dynamic and flexible: a society which appears, therefore, less "well-ordered" and consequently harder to monitor, describe and understand.

The increased flexibility of industrial relations, the decentralization of manufacturing processes, the vitality of the hidden economy, changes in both life-styles and social relationships, the persistence of informal networks and, lastly, the unprecedented phenomenon of net immigration, are unmistakable signs of a shift leading away from static and highly structured situations towards transient phenomena and accelerations in the processes of change, the numerous aspects of which defy a thorough description.

It is enough to consider some data to become aware of the extent of the changes which have taken place over the last decade. In the first place, the family and demographic structure of the country has changed. Between 1981 and 1993, the birthrate has fallen from 11 to 9.4 per thousand and the number of children per woman from 1.6 to 1.2. This has brought about a rapid fall in natural growth (a fall from 1.5 per thousand to even negative values) and considerable aging of the

population (the over-65-year-olds now make up about 16.5% of the population; in 1981 the level was 13%). In the meantime, the average number of family members has fallen (3 to 2.8), as has the marriage rate (5.6 to 5.1) and family instability has been on the increase (the divorce rate increasing from 33.2 to 72.4 per thousand).

The migratory balance, which was negative up to the 1970s, was 23,000 in 1981 and reached nearly 200,000 in 1993. Integration of foreigners has continued: in 1991-2 more than 40,000 foreigners enrolled in educational institutions of whom more than 20,000 in the universities.

Deviance and the repression of deviance have increased, with a doubling of reported crimes between 1983 and 1991 (now 2,260,000) above all among minors who in 1992 committed 4,200 bodily harm (2,800 in 1981) and 17,300 attacks on property (12,700 in 1991).

The structure of the economy has changed greatly and has moved more and more into the tertiary sector activities which now produce more than half the value added (nearly two thirds if we include non-market services). At the beginning of the 1980s, this aggregate totalled approximately 45% (less than 60% if we include non-market services). At the same time, the number of labour units in industry has fallen from 7,300,000 in 1983 to less than 6,500,000 in 1993. This fall has also been noted in agriculture. In general, however, the numbers of the employed labour force has remained more or less the same. Nearly 23% of employment is "irregular" (peaks of more than 70% in agriculture and 40% in building and transport) presenting therefore considerable problems in surveying this field.

Despite some slowing down over the last few years, the average size of enterprises has significantly fallen (ca. 200 employees in industry and less than 80 in trade hotels restaurants and catering). More than 50% of income is produced by one-man businesses or partnerships with less than 20 employees. Only in trade and construction has there recently been an increase in the average number of employees. Official statistics, here too, is faced with a fragmentation of entities to be observed, which makes its task more difficult.

Seizing this moving reality, with its turbulence and frailties, of its hurdles and potentials, represents the main challenge that Italian Official Statistics must face up to in this phase of transition. The challenge is to a certain extent similar to that facing the statistical systems of certain central and eastern European Countries after the collapse of communism. Statistical Institutes have been forced to shift, in just a few years, from the practice of simple "notarial" recording of data from administration sources, to meeting the need for surveying rapidly changing situations which to a great extent operate outside official and "regular" circuits. In this context, the experience gained by Istat, above all in the field of measuring the hidden economy (see ISTAT 1993) and investigating informal networks, has shown itself to be particularly valuable for the promotion of cooperation projects with countries moving towards a market economy.

Italian Official Statistics also appears to be fully exposed to the

contradictions and dangers affecting the most advanced industrial societies: i.e. those pertaining to the monitoring of social change, to the attention paid to territorial and local phenomena, to the push toward growing internationalization, and to the development of a knowledge industry and information- based society (see P. Garonna 1994b).

The geographic position of the Country, at the crossroads between the North-South and East-West axes of the world, fully corresponds to the interlacement of problems relating to transition and development, and highlights the political and cultural function which may be assumed by Italy also in the field of statistics.

It is foreseeable that this challenge will become more and more significant in the near future. In particular, the trend towards "deregulating" economic activities (ranging from the management of the labour market to price policies, from the systems of control and authorization to the financial markets etc.), the reform of public administration and the increasing responsibilities delegated to regional and local governments, not to mention the coexistence of variegated cultures, habits and life-styles, made more "visible" owing to intensified communication and the growing presence of immigrants.

In such a context, Italian Official Statistics will be called upon to prepare and "follow up" the different aspects of the transition and, at the same time, to provide information on - and analyses of - the changing social and institutional landscape. Moreover, in a more open and differentiated society, the referent of official statistics will tend more and more to shift from the traditional "Prince" or "Planner" to the ordinary "citizen", i.e. the individuals who expect to be well informed in order to make conscious choices which, in turn, affect the global functioning of society.

In a society as dynamic and open as contemporary Italy, in fact, decision-making tends to be more decentralized and "widespread", and therefore require more disaggregated information than that requested by static and centralized systems (see P. Garonna 1994a).

The institution and launching of the National Statistical System (SISTAN) is directed toward decentralization of both the organization and the processes of statistical surveying, in order to more precisely and rapidly monitor changes which, in general appear much earlier and in more varied manners locally than nationally (see ISTAT 1994).

The emerging need for more and more detailed statistics at the sectorial and territorial level is highlighted by the - not always orderly - growth of private (or market) supply of statistics, which responds to specialized and customized information requirements. Facing growing competition therefore, official Institutes such as ISTAT, have no alternative but to have recourse to partnership and specialization, and to take upon themselves the onerous and delicate task of promotion and support with regard to the quality of statistical information as a whole, be this public or private.

The new prospects for the production and distribution of statistical information must be considered not only in terms of competition between public and private, but also, and probably above all, aiming at creating

a coherent framework in which the multiple segments of knowledge on the one hand and differentiated organization patterns on the other can be operationally integrated. The National Statistical System (SISTAN), endowed with a modular and decentralized structure and a strong coordinating centre (ISTAT), favours the application of the principle of subsidiarity relationships in the organization of surveys and data processing among the various operators. Accordingly, the new focus of attention for official statistics becomes data quality, timeliness of information and, above all, the reliability and independence of the statistical function.

This last point is crucial for statistical progress, for the efficacy of its role, and even for the very survival of official statistics, in Italy as it is elsewhere. The strength of official statistics increasingly depend not simply from an investiture received from the central power of the state as in the past, but rather more from the ability of National Institutes to present themselves and operate as authoritative leaders within the domain, and the market, of statistical information. In a context in which statistical activity is developed also through the market mechanism, the credibility of the supplier of statistics will turn out to be a precious resource. Without sufficient credibility, official data will be considered by operators and citizens, with the same degree of sarcasm which meets in authoritarian regimes the proclamation of "aims reached" or successes. The suspicion itself, on the part of operators, that official statistical data are not sufficiently reliable means that these will have little power, on a long term basis, to influence behaviour. Such a situation would lead to increased uncertainty and mistrust, with significantly negative social and economic consequences.

The transformation of ISTAT into a research institution and the delegation to this Institute of a coordinating role and of technical and scientific authority vis-à-vis all components of the National Statistics System represents a response to the need for strengthened credibility.

In modern "open societies", the reliability of official statistical data plays a role similar to that of the stability of a currency. Only a "strong" currency is capable of ensuring orderly exchange, while "coin clipping" taking the form of inflationary policies turns away economic agents toward more secure markets.

In a similar manner, only credible official statistics can back up the behaviour of economic and social agents, and of citizens as a whole, because their decisions and rational behaviour - even their expectations for the future - are based on official statistics.

Many measures have been taken in Italy to consolidate and increase the credibility of statistical institutions. The main one of these measures, is undoubtedly the improvement of data gathering and processing techniques, as well as the sanctioning of a "transparent" approach to adopted procedures. The possibility for users to verify the correctness of surveying techniques, and of data processing and analysis, on the one hand, ensures "scientific rigor" and, on the other, permits the enhancement of the qualitative standards required from suppliers of private statistics.



The introduction of quality control procedures and of probabilistic instruments for inputting missing data has led to considerable progress in the monitoring of certain important phenomena such as in the case of the Labour Force Survey, the Multipurpose Household Survey and the Censuses themselves.

The independence of National Institutes from political pressures and interest groups contributes greatly to the consolidation of the credibility of official statistics. The 1989 reform significantly strengthened the autonomy of ISTAT and its management bodies from Government interference. From this point of view, the parallel we have drawn between statistical information and currency is in fact confirmed. No economic agent would place his faith in a currency managed on the basis of the short-term needs of the issuing banks' most important "client" (i.e. the government), rather than with a view to monetary and exchange rate stability. To avoid such suspicions, in nearly all countries, and within the European Union itself, the central bank is accorded considerable autonomy from political power. It is therefore convenient that those authorities who "issue" official statistical information enjoy a similar status to that foreseen for monetary authorities.

The institutional framework, defined in the "Statistical Law" of 1989, confirms this principle, albeit with a degree of uncertainty. But this principle must, above all, come to the fore and take Roots in practice and in the public opinion. In 1992, ISTAT began to produce an "Annual Report on the state of Italy", presented to the media, the scientific community and government authorities in the spring. By means of this report (see ISTAT 1992 and 1993), the Institute puts to the test its ability to provide an objective and exhaustive picture of the various aspects and phenomena taking place in the country, from the economy to societal change, and from institutions to the environment. Through this Report, the Institute publicly monitors the state of its technical and scientific credibility, as well as its independence. At the same time, it provides regularly a highly valued product containing analyses and information on the state of the country.

Statistics, and not just official statistics, in Italy has had to adapt to a rapidly changing situation; but it is equally true that statistics has played an active part in the changes taking place within Italian society. The impact of statistical information has become evident not only in "traditional" fields such as financial markets and economic activity, or when it concerns policy makers or academic users. Statistics is also having an increasing impact on the public opinion which is becoming more and more sensitive on an increasing number of topics. Statisticians, and above all official statisticians, are therefore taking a position of great and increasing responsibility in the process of transformation of Italian society.

ISTAT has not eluded such responsibility. The Institute among other things played an active role in the definition of the new electoral districts in 1993. It has started to provide more and more information on phenomena of great social importance such as the functioning of the Public Administration, regional imbalances, etc. Legislative authorities

for their part, seem to display greater awareness of the fact that statistical information constitutes a fundamental element in the process of control and orientation of society and the economy. This is demonstrated, in particular, by the frequent references made to statistical data and methods within legislative measures.

### **Background documentation**

ISTAT 1992 and 1993, *Annual Report on the State of the Nation, 1992 and 1993*, Roma

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# PUBLIC OPINION SURVEYS AND THE NATIONAL STATISTICAL SYSTEM

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## 1. Public Opinion Surveys and Official Statistics

In Italy, it is not an idle question whether or not public opinion surveys belong to the system of official statistics. This is so for two reasons.

On the one side, the category of public opinion surveys include polls carried out on very extemporary phenomena and with very uncertain methods. So, academic statisticians and responsible bodies of the National Statistical System (SISTAN) do not trust opinion polls and ask for a clear distinction of which, and at which conditions, opinion surveys should be considered acceptable, and which should instead be left out the sacred field of official statistics.

On the other side, the law instituting the Italian statistical system was issued at the end of 1989, but the system dynamics is still at its start. New informative functions have been assigned to the Statistical Office of several peripheral units of the Public Administration.

Our view is that public opinion surveys may be considered as official statistics provided that

- a) the grain (i.e. the informative value of these surveys) be separated from the chaff (i.e. the ruffled techniques often used for data collection),
- b) contents and methods be integrated within the framework of the SISTAN's statistical programme.

Ours is not an isolated view since opinion and attitude questions are put forward in basic surveys currently carried out by the Italian Statistical Institute (ISTAT), such as the Household Multipurpose Survey and the Labour Force Survey. Moreover, a law issued in 1990 allows Municipalities to carry out their own surveys for planning and managing public services (details of this law are presented in Sect. 4).

Opinions are surveyed in official surveys in many countries without documented disputes about the acceptability of answers to subjective questions being argued for official statistics estimation. What is peculiar in Italy is the extent of the official statistical system represented by the institutive law and the autonomy of the Statistical Offices of the administrative bodies belonging to the SISTAN.

The Italian statistical system includes the National Statistical Institute (ISTAT) in Rome, the Statistical Offices of all national administrative units and public firms, 20 Districts, about 100 Provinces, Prefectures and Chambers of Commerce, more than 600 Health Local Units, about 1800 larger Communes. At its completion, the SISTAN will include, excluding ISTAT, about 3,000 national or local Statistical Offices.

A statistical office of an administrative entity operates both as a network terminal of the SISTAN and as the manager of the informative system of its administrative entity. The amount of work devoted to the national system tasks and the internal informative demand varies according to the type of unit. For example, the Statistical Office of a Ministry – which transfers annually its salient statistics to ISTAT – is expected to devote to the internal informative needs an attention larger than that of a medium size Commune currently engaged in social and economic data collection activities on behalf of the National Statistical Institute.

Anyway, if an office of the statistical system is enabled to carry out its own surveys, should it be controlled for contents, methods of data collection and analysis, and diffusion of the outcomes? Should it nevertheless have the support by the national system, and how? Should at least the people involved in non-standard statistical activities at the local level be taught on how to proceed?

Moreover, if a Statistical Office behaves incorrectly while it performs a survey activity, does this endanger the system of official statistics directly, indirectly, or at all? And could we discuss about legal responsibilities of incorrect behaviours?

This is just a sample of the questions brought to my mind whenever the statistical system is developed in the way touched upon. I have no specific qualification to give answers to them; therefore I shall limit myself to the spell of problems, trying to unwind their skein, possibly prepare warp and weft, and let others construct adequate solutions.

In Section 2 we deal with public opinion surveys with the aim of defining the kind of surveys to be considered for the statistical offices of the SISTAN. In the following section (Sect. 3) some features of the admissible public opinion surveys are highlighted. The intermediate sections are concerned with the decisions of survey execution (Sect. 4) and content (Sect. 5), data collection (Sect. 6) and processing (Sect. 7), and outcomes diffusion (Sect. 8). In the closing section (Sect. 9) some opinions matured after discussion with official statistics experts and people operating in the existing statistical offices are given.

## **2. Public Opinion Surveys**

Public opinion surveys are defined as direct surveys characterized by the collection of data on opinions, attitudes, forecasts and expectations, and other non factual contents.

Normally, this kind of surveys is based on questionnaires, either filled in by respondents, or administered to informants by interviewers. Samples of respondents are limited in size, sometimes of the panel-type. The curiosity for the subject matter and the volatility of the surveyed phenomena is such that the diffusion of the results is at the data collection's back, and often mass media happen to foster, with comments, the data.

The origin of public opinion polls dates back to the beginning of the XIX century. It is known that, at that time, Daniel Defoe, in England, and La Fayette, in France, structured a network of regional correspondents to survey people's attitudes (Droesbeke et al., 1987). In the U.S.A., electoral polls have been used, with alternate effectiveness, since 1824.

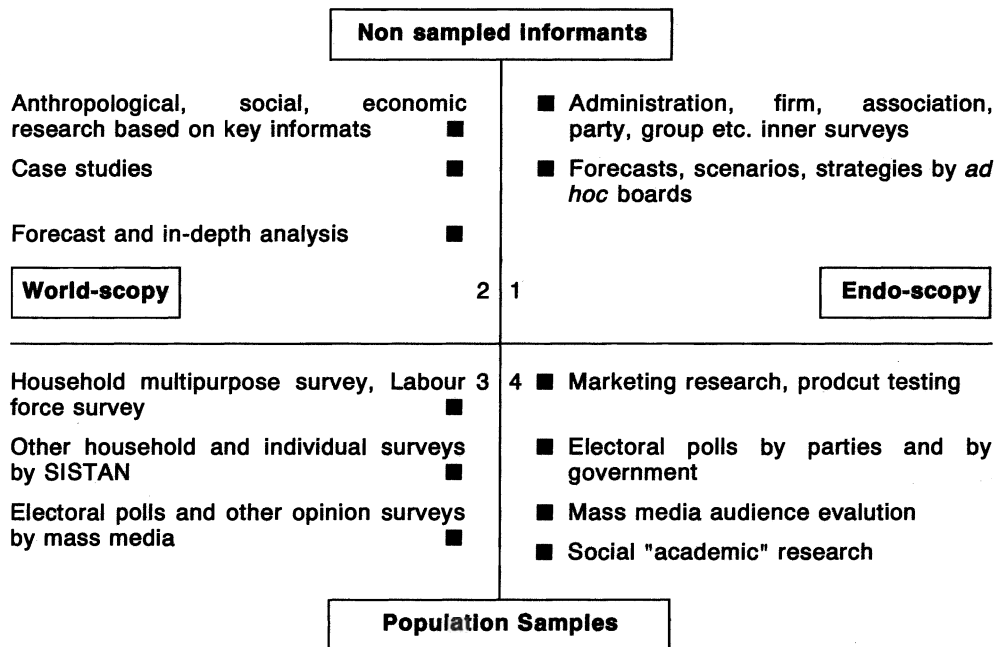
The development of a statistical methodology parallels the use of statistical methods in surveys. The methodology of random sampling, the methodology for questionnaire design, the use of refined techniques for the detection of sensible facts or opinions (e.g. the randomized response technique), the growing care of statisticians for data quality measurement and control, all this contributed to reduce the unreliability engrained in the detection of public opinion.

To have an idea of the types of opinion surveys compatible with a public statistical system, we can classify surveys according to the way informants are chosen to represent the phenomenon we are concerned with, and to the purpose of the survey.

Informants may be either samples of the general society (and inform about themselves or their unit, i.e. family, firm etc.), or the ones who, being the most knowledgeable on the studied phenomenon, are chosen as privileged respondents (they basically inform about the phenomenon at concern).

The purpose of the survey may be either of representing phenomena internal to the unit which requires the information (**Endo-scopy**), or of representing phenomena of a societal interest (**World-scopy**).

If we represent the two dimensions as in Fig. 1, opinion surveys are categorized into 4 classes. Some of the topical surveys are written into the 4 quadrants obtained crossing the two dimensional axes.



**Figure 1. Opinion surveys classified by purpose of the survey and type of respondents**

**NE** Endoscopic surveys based on key informants' opinion (quadrant 1) are:

- those promoted by corporate bodies, associations, parties and other groups for their own internal purposes,
- forecasts, scenarios, strategic policies produced (by means of Delphi-type techniques and the like) by ad-hoc boards

**NW** General surveys based on data produced by key informants (also called witnesses) are (quadrant 2):

- anthropological, social and economic research for description and analysis of particular situations
- case studies
- forecasts of social and economic phenomena with Delphi-type techniques

**SW** General surveys based on samples of the pertinent populations (quadrant 3) are the ones common to official and social statisticians

- surveys on households and corporate bodies carried out by the National Statistical System (such as the Household multipurpose survey, the Labour force survey, the Survey on family budget, the Survey on the product of industrial firms, and the like)
- electoral polls and other surveys on public opinion status and variation usually carried out by private statistical agencies
- other surveys on public opinion status and variation

**SE** Surveys on general population sponsored by private bodies for their own purposes (quadrant 4), such as

- marketing research and product testing
- mass media audience evaluation (newspaper readership, TV audience meter, ...)
- electoral predictions sponsored by political parties to frame their political decisions, or by the Minister of the Interior to feel the population pulse

- what may be called the "academic social research", i.e. the research whose outcomes are never known by anybody but the "researcher" (1)

### 3. The Official Character of Public Opinion Surveys

The surveys which interest the SISTAN's Statistical Offices are of two kinds:

1. those carried out by the administrative unit to know better its own structure and refine its own policy (quadrant 1), and
2. those intended to implement the National Statistical System (quadrant 3).

The first kind of data, even if collected for public utility purposes, produce "private" statistics, irrelevant to social knowledge. For example, it is irrelevant to the general public if either the ISTAT or a Commune surveys its employees to solve its problems of manpower planning. That information is certainly needed by public administrators to manage the body they are at the head of (2).

The second kind of surveys interests the National Statistical System. No limits on the content but its public utility. Even electoral polls might be considered: the Law 142/1990 on "legal system of autonomous Local Authorities" indicates that Communes can introduce into their statutes "forms of polls of the population ... aiming at promoting interventions for a better protection of the community's interests" and also "consultative referendums if required by an adequate number of citizens".

Opinions of key informants, such as experts of the topical field, managers of corporate bodies, political and syndicate representatives, and other decision-making people, may and are collected by offices of the SISTAN and, after appropriate processing, published as official statistics for decision making.

The quoted law deals explicitly with surveys in Communes, most of which do not have a statistical office. We do not see any reason why the statistical offices of other autonomous Local Authorities (Districts, Provinces, Health Local Units) should be denied this opportunity.

The stated intention by ISTAT to start – at least experimentally – public opinion surveys would favour three basic aims:

- 1) to make politicians aware that this is a general interest field, and assure public opinion and political science experts that no unadvised decision will alter the actual possibility of probing public opinion,
- 2) to improve the reliability of results through the development and experience of survey methods following the tracks of the Household

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(1) This may also be a joke.

(2) I know that people who believe that public information should be left at everybody's disposal may not like my unconditional position. In general, I agree with this position, but believe that the excess of information is noisy and makes the information relevant to problems less clear.

multipurpose survey and the Labour force survey. Performing surveys at the local level will certainly improve the data collection skill of SISTAN's peripheral units and this may be the basis for setting up a standing network of interviewers and field supervisors (see also Sect. 7 on that),

- 3) to stimulate – by implicit competition – private agencies operating in the topical field to refine their methods of data collection and data quality analysis.

The activity of the peripheral statistical offices may be co-ordinated even if their activities are beyond the scope of the national statistical programme. With reference to the co-ordination of the activity of peripheral offices for locally defined purposes,

- (i) an integration of the locally collected information with the official statistics system is needed (Rey, 1990),
- (ii) the National Statistical System should consider the possibility of endorsing the aims of the local surveys. This would certainly encourage the work of statisticians engaged in the statistical offices,
- (iii) the effective support to the peripheral offices by the National Institute may come from purposive meetings where survey experiences are discussed and methodological topics are put forward <sup>(3)</sup>.

#### 4. The Decision to Collect Data on Public Opinion

Quoting A. Girard (Antoine, 1969), "public opinion does not determine by itself a policy ... but no policy can be put forward neither against it, nor without it". The interaction between policy-makers and public opinion is then essential to democracy. This implies that knowing public opinion is important not only with reference to a given instant but also in the long time. To a statistician's mind this would call for a public opinion observatory based on some panel surveys.

The role of a statistical office is certainly different in public opinion probing. Firstly, just a few Communes have at their disposal an office with staff sufficient and qualified to perform such a task <sup>(4)</sup>. Official

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(3) In Italy an association of the Statistical Offices of the largest Communes, called USCI – Statistical Union of Italian Communes, is active in the promotion of meetings and exchange of experiences between Communes. The SISTAN could profit of this age-old institution.

(4) A survey by ISTAT (Rey, 1990) on the status of peripheral offices shows that: (a) District offices act basically as an intermediate between the National Institute and other administrative units; only the statistical offices of the autonomous provinces of Trent and Bolzano are fully devoted to statistical activities; (b) most Provinces, Prefectures, and Local Health Units have no statistical offices and statistical duties are carried out by other administrative offices; (c) each Chamber of Commerce has its own statistical office, but the average number of assigned people is 2.5 per Chamber, rising to 5.9 with people of all research departments; (d) only Communes with at least 100,000 inhabitants and few others (130 as a whole out of 8100 Italian Communes) in 1985, have a statistical office; the average number of people carrying out only statistical duties is 6.3 per Office.



statistics generated by national surveys take advantage of large samples of population and firms, or of repetitive surveys, refined as data collection, manipulation and analysis techniques. Local surveys are necessarily smaller in size and interviewers in most cases have to be recruited ad hoc. All this makes it the risk for "wild" surveys much larger at the local than at the national level.

The competition would also start a hopeless cold war with the private statistical agencies which operate on the topical field.

At present, only a limited number of purposive studies should be realized at the local and national level. The respondents' burden should be lightened both in the number of people to be contacted and the information to be drawn from them. A self-contained activity of local offices is necessary; a supervision by the SISTAN's responsible staff may strengthen the statistical system.

According to Law 142/1990, a shift in the responsibility of promotion of these activities from policy-makers to the community as a whole is perceivable. In a certain way, polls may become a tool for the community's direct participation in its administrative life.

## 5. Which Data to Collect

The only data to be collected are those pertinent to the information really needed by the community. The collection of the so-called "sensible" data should be as limited as possible.

Law no. 322/1989 defines as sensible "the individual data related to race, political and ideological opinions, religious belief, ... health status, sexual life, convictions" <sup>(5)</sup>. These are phenomena people are not obliged to inform about. Of course, questioning about them is not forbidden.

Electoral polls too may become an interest of the National Statistical System. Harsh disputes about the forecasting of voting based on polls recur at every election. One of the articles of the Italian electoral law recently discussed for approval by the Parliament prevented the spread of voting forecasts one month before the elections. This norm might be cancelled, but it is an evident symptom of the sensibility of politicians and of social lobbies to the problem. Why not consider the possibility of governing this hot matter?

A feature of opinion polls that would heighten their informative relevance is their ability in detecting the risk of social breakdowns, rather than describing social distress. The latter is often disproved by further outcomes, the former would help strategic decisions. The detection of risks of social breakdowns could be an ambitious target, anyway.

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(5) The sensible variables quoted in Law 322/1989 are the same as the EEC Convention of Strasbourg no. 108/1981 on the protection of individual data as to automatic processing.

In a complex survey, after the research aims are stated, its control shifts from its promoter to one or more professionals (Sociologist, Psychologist, Statistician, ...). Therefore, the decision on what and how to ask people is up to the data collection organizer(s). For the quality of official statistics, and in the long run even for statistics itself, it is convenient that the questionnaire and the respondent's approach be "politically" evaluated by survey promoters or by independent bodies, so that the public interest of the survey and the respondent-statistical system empathy can be safeguarded.

Problems for a statistical office may arise if its activity on public opinion detection conflicts with the political addresses of the Local Authority it serves. I am aware that it is more easily said than done, but, in the long run, it is safer for statistics if surveys are deemed to serve general rather than partisan interests.

Neutrality with respect to the subject matter is the only guarantee against the risk of manipulation of results. Besides, it is not the statistician's task to define the borderline between "private" and public utility of a survey, but the whole society's, possibly through its delegates.

## **6. Who Should Collect the Data**

Official statistics are a product of the activity of the National Statistical System. They are ordinarily collected by the statistical offices of administrative bodies, but may be collected also by private agencies under the SISTAN's supervision. The latter is, for example, the case of the data on air and marine pollution collected by both private and semi-public agencies and used for environmental statistics.

Whichever the data collector, the SISTAN's pertinent Statistical Office should supervise its activity. The "imprimatur" of an official body gives to a statistics the seal of reliability.

## **7. The Processing of the Data Collected**

The analysis of the data collected should be carried out by the Statistical Office itself. Public opinion surveys typically involve the use of analytical methods more sophisticated than usual enumerative surveys. In the former type of surveys the use of multivariate analytical techniques to find relations between variables, or sets of variables, is not uncommon.

The statistical education of the population is such that two distinct informative circuits should be activated: one of standard statistics, open to anybody, and another of more refined analytical statistics, addressed to experts of the topical field, researchers, and specific users (public administrators and corporate bodies).

Even if the data are processed with standard methods, the evaluation of the reliability of statistics requires the upgrading of the skill

of people operating in the peripheral units of the SISTAN. Many of these operators may not name themselves statisticians.

As the analysis of data from samples depends both on the sample and data collection design, the skill of the data analyzer has to be completed with an adequate knowledge of the impact of the survey design on the reliability of estimates.

Then, the analysis of data at the local level makes both the upgrading of in-service people of the statistical offices and the recruitment of qualified statisticians necessary, for this technical task can hardly be performed by alien experts.

The development of a processing skill at the local level is the crux of the improvement of the validity of the data collected by a national network. In the following sense. Designing an adequate data collection scheme is not an easy task, whatever the size of the sample. Nevertheless, people belonging to a Commune's Statistical Office might be drawn to believe that practicing data collection for the Labour force survey gives them enough hints to perform autonomous surveys on households in their territory.

Nothing but the direct experience in fully performing a survey helps to understand the importance of questionnaire design, the biasing effect of interviewers' subjectivity, and the disrupting impact of response errors and nonresponses on estimates' reliability, even when the sample was accurately selected. In other words, the relevance of the single operations of a survey is better understood when the whole survey is carried out.

A statistical office aware of the elements crucial to survey validity becomes a mission for the statistical education of its community and an efficient terminal of the national statistical system.

## **8. Diffusion of the Outcomes: the Possible Violation of Statistical Secrecy**

For a SISTAN's statistical office the norms on data diffusion are in Law 322/1989, i.e.:

- a) since the statistical information belongs to the community <sup>(6)</sup>, everybody is enabled to access it together with a fair guidance (meta-data) for the evaluation of its reliability,
- b) the office is bound to keep the individual information secret,
- c) the aggregated data should be spread in such a way that it is impossible to go back to the respondent.

All statistical offices of the public system may get and analyze the data collected to realize the objectives of the national statistical

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(6) Also according to Rey (1990), "The circulation of the statistical information is the obvious consequence of its production. The costs met by the community for its production imply the feedback to it as knowledge and instrument for democratic control to possibly improve the public services"

program. An administrative unit may ask its statistical office to analyze the system data for its institutional activity, but it cannot be given any individual information acquired by the office for its analyses.

Regulations trace the outline where an office is clearly separated for institutional and practical reasons from the other offices of the administrative unit. It has technical autonomy and legal responsibility <sup>(7)</sup> in managing the statistical information. Such an office may assume a paramount role within the administrative unit.

The possibility of guessing whom a particular result applies to is easier where everyone knows everyone else, and certain groups have very low frequencies (a typical case is that of firms classified according to economic and size class). Statistics should then be given out for large categories of respondents; detailed analyses apply to data which cannot be ascribed to respondents. For example, sensible data of a recognizable category of population should not be published, whilst there is no reason why the low frequency of a particular opinion over the whole population should not be published.

Therefore, since statistics at the local level are even more exposed to the risk of violation than the national ones, what are the rules for data dissemination? The Bifront nature of local Statistical Offices allows a double attitude: data belonging to the national statistical system should not be put at outsiders' disposal, while data which integrate the inner informative system can be accessible to everybody.

## 9. Final Considerations

The arguments dealt with in the preceding sections highlighted the following operative points. Firstly the necessity of developing local statistical offices both numerically and qualitatively.

Statisticians are and may remain a minority in the existing statistical offices. Of course, at any recruitment competition for personnel in statistical offices, statisticians should be preferred. But we doubt that it will be possible to find enough statisticians to cover the needs of the National Statistical System. Moreover, many practitioners at the local level are skilled in statistics even if they graduated in other disciplines.

The basic problem of the Italian Statistical System is the settlement of statistical offices. Once a statistical office is settled, whoever the experts assigned to it, it is up to the SISTAN to refine their skills.

Data formation, demographic, economic and statistical analysis are basic skills for people at the statistical office to perform adequately their duties. An important but often ignored skill is the ability to communicate the results of the analysis to a non-technical audience. This is one of the barriers to be removed to foster statistics outside the statistical circuits.

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(7) In fact, the employees who would spread out incorrectly the statistical information commit an indictable offence.

The second point is the SISTAN's responsible bodies' awareness of the financial resources, the equipment, and the persons both actually employed by the statistical offices or likely to be assigned to it for its set up.

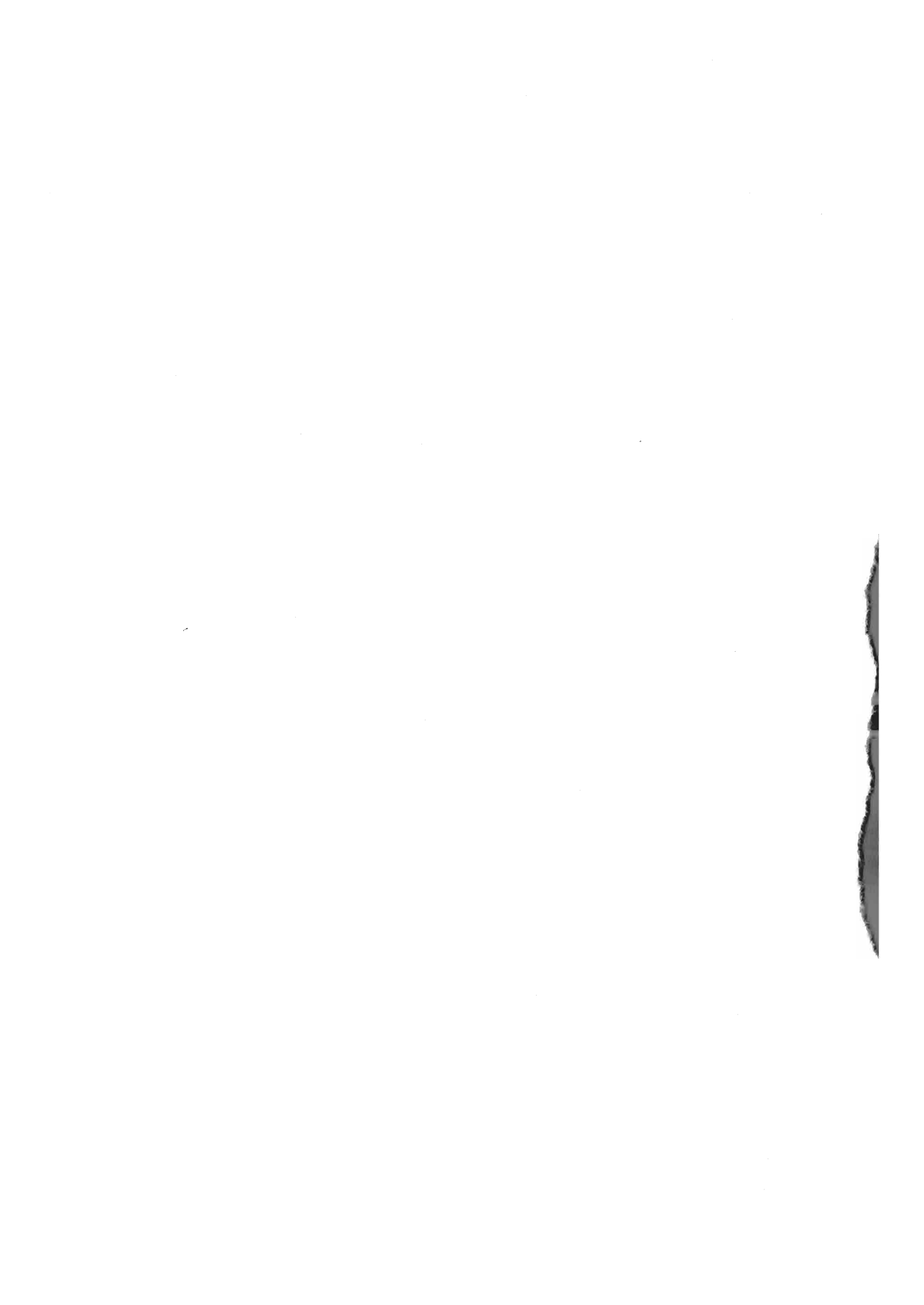
A survey on statistical offices should get the system acquainted also with its people's skills about the new duties they are given. Their ability to design questionnaires, samples, and data collection strategies, interpret and communicate statistical results, integrate survey and administrative data (drawn from their informative systems) should be known.

The survey ought to inform also about the office activity and the removability of the perceived limits to the realization of its purposes. It is important to know if difficulties arise from the political situation or from contingent causes which an expression of will of the national system could remove.

The last point is the relation between the SISTAN's offices and public opinion agencies for the collection of topical data. The risk of a conflict of interests is minimum. The new tasks assigned to the statistical offices imply the widening of the actual concern of public opinion polls. Therefore, provided the ISTAT decides not to settle its own fixed networks for data collection, serious agencies may be contacted by the statistical offices to serve as data collectors for their surveys. The situation remaining as it is, it is profitable also for private agencies which are able to guarantee good performances.

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# INCOME, CONSUMPTION AND LABOUR FORCE SURVEYS: AN OUTLOOK ON ITALY

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## Introduction

This paper describes the main features of Italy's most important official household surveys, namely, the Bank of Italy's Survey of Household Income and Wealth (SHIW), Istat's Survey of Family Budgets (SFB) and Istat's Labour Force Survey (LFS). SHIW collects data about income and wealth and SFB focuses on consumption, while LFS inquires into the structure and distribution of the labour force. As one of the most important sources for estimating the state of the economy, the latter is probably the most widely used. SFB provides information about household expenditure and its components while SHIW is mostly used for micro-economic studies.

These surveys are not the only sources of information about individual and household behaviour (much can be found in Istat's Indagine Multiscopo and other unofficial sources). However, they are the most commonly used in scientific empirical studies. Moreover they have all been conducted for decades, so that (at least in principle) comparisons over time are possible.

A detailed description of the methodology of these surveys would require a far longer paper. Many researchers have analyzed and discussed the sample design and the methods of data collection, assessed the error profile of each survey and put forward proposals to improve data quality (1). Our aim is to present a unified picture, from which, hopefully, to derive some suggestions for each.

SHIW, SFB and LFS are similar in many respects (see Table). The statistical unit in all three is the household. They all use a two-stage stratified sample design. In the first stage municipalities are selected from strata defined in terms of (roughly) the same geographical areas and population size of the municipalities and in the second households

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(1) Many of the considerations in this paper draw on more specific works by Brandolini (1993), Brandolini and Cannari (1993), Filippucci and Marliani (1992), Fabbris and Bernardi (1986), Innocenzi (1992), and Trivellato (1990).

are randomly drawn from registry office records <sup>(2)</sup>. Moreover, from the standpoint of economic analysis, the surveys are strongly related.

The usefulness of the SHIW data on income and wealth, with detailed information collected for each household member, is unfortunately undermined by high nonresponse rates and an appreciable under-reporting of assets, attributable to the sheer size of the questionnaire, as well as many households' marked reluctance to disclose details of their affairs. Our main suggestions for this survey accordingly call for shortening the questionnaire and experimenting with ways to increase the response rate. At the same time, a greater effort should be made to discover who the non-respondents are.

Details on consumption expenditure and its components are collected by Istat's SFB. The main problems with this survey are the short reference period for some expenditure items and the sample design. Lengthening the reference period would reduce the variability of estimates of consumer durables, but the heightened risk of misdating past events could increase measurement errors. One possibility might be resort to a panel scheme. Among other things, a panel survey would estimate the longitudinal age profile of income and consumption more accurately.

LFS collects data on the behaviour of individuals in the labour market. It estimates total employment and unemployment and breaks down labour market aggregates by geographical area and sector of activity. The cyclical relevance of this survey is reduced, however, by long lags before the results are released and by its only quarterly frequency. A possible remedy could be more frequent polling of a small sample with a short questionnaire, together with a less frequent survey of a larger sample. For completeness, some basic data on income and wealth might be collected on a subsample at longer intervals. However, any refinement must be handled with extreme care; past changes and refinements have often been mismanaged, creating breaks in the aggregate series and diminishing its usefulness as a cyclical indicator.

Many of our proposals would require more professional interviewers; in fact, the field work is a prime source of weakness for all three surveys, and in particular for LFS and SFB, which do not use professional interviewers. Neither the Bank of Italy nor Istat has much control over the field work; the former contracts the interviewing out to a market research firm, while the latter relies on local municipal employees. The new procedure employed by the Bank of Italy for the 1991 SHIW is interesting: a second firm was engaged to audit the survey, thus furnishing information about the quality of the field work and also acting

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(2) In each municipality, the General Registry Office keeps and continuously updates the list of resident households. Those moving to other municipalities or abroad are required to inform the registry office. The 1991 census data, however, have revealed errors and biases in the registries as well. Furthermore, the errors (which add up to a difference of a million persons in national population) are found disproportionately in the South of the country.



as a motivating device, as interviewers knew they would be checked. No such approach is likely to be feasible for Istat, however, given its greater number of surveys and far larger samples.

### Main features of Italian household surveys

	Survey of Household Income and Wealth (Bank of Italy) SHIW	Survey of Family Budgets (Istat) SBF	Labour Force Survey (Istat) LFS
Sample design	Two-stage stratified cluster sampling PSU: Municipality SSU: Household		
Basic survey unit	<i>De facto</i> Household	Legal Household	
PSU strata	No		
PSU strata	Defined (mainly) by geographical area and population size of municipality		
SSU strata	No		
Panel scheme	Yes	NBo	Yes
Post stratification criteria	No	By household size	By age and sex
Sample size households	8,000	39,000	70,000
Frequency	Zvery two years	Annual	Quarterly
Core of the survey	Income and wealth	Consumption expenditure	Employment and unemployment
Main problems and improvement	Non-response and under-reporting	Reference period for durables	Low frequency
	Changes in methodology	Lack of a panel scheme	Changes in methodology
	Poor quality of consumption data	Poor quality of data	Lack of income and wealth data
	non-professional interviewers		
Better use of administrative data for stratification and/or post-stratification of PSUs and SSUs			
Reduction of definitional disparities between surveys			
Design of a more closely integrated framework			

A common problem is definitional disparities, which hamper comparisons between different surveys. Researchers often request a more integrated framework. As a first step towards this, definitions, concepts and methodologies should be put on a comparable basis, and the statistical breakdown of published tables should be based on a large set of classificatory variables defined in the same way. We also suggest experimentation with matching the three surveys both using a subsample and on statistical basis.

The paper is organized as follows. In the first two sections we deal respectively with the Bank of Italy's Survey of Household Income and Wealth and with Istat's Survey of Family Budgets and in the third with Istat's Labour Force Survey. A brief history of each survey is followed by a description of its current definitions and methodologies, then a review of the main problems and some proposals for an improvement. In section 4 we deal with issues that are not survey-specific but relate to the design of a more integrated framework.

## 1. The Bank of Italy's Survey of Household Income and Wealth

### 1.1. A brief history

The Bank of Italy's Survey of Household Income and Wealth (SHIW) has been conducted since 1965, yearly until 1987 (except for 1985) and every two years thereafter.

The aim of the survey is to gather information concerning the microeconomic behaviour of Italian households. Data on income (net of taxes and social security contributions) and wealth form the core of the survey. Over the years the survey variables, sample design and methodology have undergone a number of changes, hampering intertemporal comparisons.

The definition of income was kept largely unchanged until 1986. An overall revision of the survey in that year brought the definitions more closely in line with the national accounts, introducing the distinction between receipts on income account and transfers on capital account and also between income from unincorporated enterprises and that from quasi-corporate enterprises. A further difference regards interest and dividend income: until 1986 interviewees were questioned specifically on this item; since 1987, it has been computed by multiplying holdings of each type of financial asset by the average market return on it. In 1989 and 1991 the wording of the questions concerning some income components, especially for the self-employed, was slightly changed.

Estimates of household real estate holdings are based on definitions that have remained largely unchanged over the years. On the contrary, questions on financial assets have undergone frequent changes of definitions and of wording.

Data on consumption spending have been collected since 1980 with only few questions, essentially to improve checks for internal consistency. In recent years, however, more attention has been paid to consumption and some expenditure items have been added to the questionnaire.

Sampling has always been conducted in two stages: municipalities are selected in the first stage, households in the second. Major modifications were introduced in 1984 and 1986. Until 1986 municipalities were selected on the basis of the local availability of professional interviewers. The system had the undesirable effect of under-representing some "poor" areas of the country. Since 1986, they have been randomly selected with a scheme that is consistent with that used by Istat's LFS. Until 1983, households were drawn from the Electoral Register, owing to the fact that the Bank of Italy had no access to registry office records. Thus, larger households were more likely to be selected and household income (as well as other survey variables) were biased upwards. Since 1984, the collaboration of Istat (and the municipalities involved) has made it possible to draw households from registry office records, thus eliminating the bias.

To reduce the variance of estimates, the sample size, ranging from 3,000 to 4,000 until 1984, was doubled in 1986 and kept unchanged thereafter. To further reduce the standard errors of some estimates,

especially those of variations of household income and wealth over time, the sampling scheme was revised in 1989 and a panel section was included in the sample. In 1989 about 1,200 of the households surveyed in 1987 were re-interviewed. In 1991 this panel section was increased to about 2,200 households.

## *1.2. Definitions and methodologies*

### *1.2.1. The information*

The basic survey unit is the household, defined as a group of individuals linked by ties of blood, marriage or affection, sharing the same dwelling and pooling all or part of their incomes. Persons living in nursing homes, prisons and military installations are excluded. If two or more nuclear families are listed separately at the registry offices but are linked by family ties and live together, SHIW records them as one household.

Sex, age, education, occupational status, sector of activity and relationship to the household head are recorded for each household member. The head is defined as the person most knowledgeable about family income and wealth.

Wages and salaries, self-employment earnings, pensions and other transfers are recorded on an individual basis, with the exception of incomes from household enterprises. Income from property (interest, dividends and rents) is conventionally assigned to the household head <sup>(3)</sup>.

Estimates of the market value of real estate are generally provided by the household head. Data on residential property (size in square meters, building date, location) are also collected.

Financial assets emerge as a serious problem area, because of the unwillingness of households to declare their holdings. The questionnaire has been repeatedly revised to cope with this problem.

In the current survey, households are asked to supply information on the percentage composition of their portfolios; only after completing this section do they face some questions on the actual amount of their holdings. Thus, information on the percentage composition of financial wealth of the household can be obtained even from households that do not intend to disclose their worth.

Information on consumption is collected with just a few questions, distinguishing between durables and nondurables (a distinction not available in 1986). In the current questionnaire spending on valuables, motor vehicles and other durables is recorded separately. The main nondurable items reported are food expenditure (monthly), rent (monthly), house maintenance (annual) and other outlays (annual).

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(3) Interest and dividend income, computed by multiplying holdings of financial assets by the average market return on each type, are imputed to the household as a whole. Rents are recorded for each residential and non-residential building or property owned. Homeowners are asked to estimate the implicit rent of their own dwelling. However, rental income could be separately attributed to each household member, as information about real estate ownership is recorded.

### 1.2.2. *Sample design*

The current sample is made up of two subsets: households that did not take part in previous surveys (non-panel) and households already interviewed (panel section). The former is selected by the two-stage stratified cluster sampling procedure described above <sup>(4)</sup>. The panel coincides with the set of respondents to the previous survey who had agreed (two years before) to be re-interviewed and are resident in municipalities with over 40,000 inhabitants or more than 5 households interviewed.

First of all, interviewers try to contact households participating in previous surveys, to get as large a panel subsample as possible. Then the non-panel subset is approached. If any household declines to cooperate, interviewers resort to a list of alternates, selected from the registry office records with the same criteria as the main sample.

### 1.3. *Some issues and suggestions*

Non-response and under-reporting are the main shortcomings of SHIW. Participation is voluntary and the response rate has traditionally been low, because of severe distrust. Such efforts to overcome non-response and under-reporting as the distribution of a booklet explaining the reasons why the survey is conducted and assuring confidentiality, giving households reports of previous surveys and issuing special identification cards to interviewers have not proved very successful.

At first glance, distrust seems to have risen over time: after oscillating around 60 per cent until 1987, the overall response rate dropped to 37 per cent in 1989. This rise, however, may be more apparent than real. First, since 1989 interviewers have also been paid for information provided concerning non-responding units <sup>(5)</sup>. Second, in recent surveys data collection has started in late spring and been completed during the summer; thus, as people went on holiday, noncontacts increased. Finally, since 1989 households that participated in previous surveys have been asked for re-interviews, and the response rate of this subset has been lower.

The theoretical sampling weights (computed on the basis of the ex ante probabilities of selection) are adjusted ex post using the response rates estimated for each municipality. This procedure is not fully satisfactory because the probability of responding might differ according

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(4) Municipalities are divided into 51 strata, defined by 17 areas and 3 population classes: over 40,000; 20,000-40,000; under 20,000. All the municipalities in the first class are included; those in the second are randomly selected with probability proportional to their population; the same criterion is applied to the municipalities in the third class, after further stratification by type of terrain and prevalent economic activity. Households are then randomly selected from registry office records.

(5) They may have slackened their efforts to persuade households to participate.

to gender, age, education, occupational status, income, wealth and other personal characteristics.

Only a few studies have examined the characteristics of nonrespondents. In 1987, interviewers were requested to ask neighbours or caretakers about nonrespondent families or to try to provide information about them (for example, estimating their social status by the characteristics of their dwelling). Only minor differences with respect to interviewees were found, the most significant being a lower propensity to respond among small households (Banca d'Italia, 1989). These findings, however, are to be taken very cautiously, because they are based mainly on interviewer judgements.

Cannari and D'Alessio (1992) have examined the characteristics of households that dropped out of the panel after an initial interview. They found that the response rate ranged from 26 per cent for low-income families to 14 per cent for the wealthiest families, fear of crime being the main reason for non-response among the latter. These findings, too, need to be taken cautiously. The problem here is that second-wave nonrespondents may be very different from the nonrespondents in a one-time survey.

Comparison of survey estimates to census or other data is another widely used method of assessing nonresponse and under-reporting bias. According to Brandolini and Cannari (1993), compared to the national accounts SHIW slightly overestimates wages and salaries, while underestimating self-employment income by almost one half; pensions fall short of the national account figures by almost a third. In investment income, net interest on financial assets emerges as a serious problem area, whereas rents are overestimated by about 7-9 per cent. On the whole the shortfall of total disposable income appears to be around 25 per cent, whereas for consumption it is about 30 per cent.

Even this assessment is not fully satisfactory, however. Comparability with the national accounts is weakened by differences in definitions and concepts, and both sources may suffer from measurement errors. In addition, the comparison between aggregate estimates does not make it possible to distinguish nonresponse bias from under-reporting. The latter is not negligible in the SHIW. Cannari and Violi (1991) estimate the under-reporting of self-employment income at over 20 per cent. Cannari and D'Alessio (1990), after correcting for under-reporting of real estates, revised the estimate of average household income upwards by about 4 per cent. Under-reporting of financial assets is even more substantial.

There are many potential ways of improving response rates and reducing under-reporting or response errors (see for example Groves, 1989). Some of them are the subject of controversy among survey statisticians and will not be discussed in this short paper. Some proposals, however, can be put forward. First, the collection of data should start early in the year, in order to avoid the summer holiday season. Second, the questionnaire should be shortened. In the debriefing, many interviewers argue that the attention of respondents declines in the final sections of the questionnaire. Thus, responses at the end of the interview would be subject to greater measurement error than those at the beginning. This is

plausible and might explain why consumption expenditure, which is put at the end of the questionnaire, is more heavily underestimated than income.

The current questionnaire is made up of a multitude of forms: some do not seem relevant to the core of the survey and could be submitted to only a subsample. The questionnaire for the panel respondents could be modified to avoid duplicating information that is already available <sup>(6)</sup>. Computer-assisted interviews would make such a change easier.

Details on some phenomena that are available from other sources might be dropped. In this case, a more integrated framework would be required and the comparability of definitions, concepts and methodologies across surveys should be increased. This issue is examined in section 4.

In the context of a more integrated framework, SHIW definitions of income should also be compatible with those reported in tax files, and a grossing-up procedure should be routinely applied to SHIW after-tax incomes to estimate pre-tax aggregates. An accurate comparison with tax records may help to understand who the non-respondents are and what kind of mis-reporting is most likely.

## **2. The Istat Survey of Family Budgets**

### *2.1. A brief history*

Information on consumption expenditure was collected by Istat in a survey of the budgets of non-rural families, in 1953 and 1954. The Institute conducted a new survey of family budgets in 1963-64 as part of a project undertaken by Eurostat. Some years later plans were drafted for a regular survey of family budgets, focusing on detailed information on consumption expenditure and its composition.

The first survey of the series was conducted by Istat in 1968. The data collected were initially used as an external yardstick for national account estimates of household consumption. Over the years, however, this function was downplayed, because survey aggregates were considered to be underestimated. Thus, the survey has been used mainly for microeconomic purposes, such as estimating weights for computing price indexes and gauging poverty <sup>(7)</sup>.

Following EEC directives, in 1979 questions on monthly household income and annual savings were added. These were essentially conceived as a by-product. The results were not fully satisfactory, however, and the information on income and savings was not published. In 1980 the questions on income and savings were permanently incorporated.

After a decade of substantial stability (with minor changes that lengthened the questionnaire), at the end of the eighties Istat undertook

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(6) For example, if a household was interviewed in 1989 and is still living in the same place in 1991, we could refrain from repeating the detailed items on the dwelling in 1991.

(7) See Gorrieri (1985) and Sarpellon (1992).

a research project on private consumption ("Le statistiche dei consumi privati nel sistema statistico nazionale"), which elicited many proposals for revision of SFB from the researchers. Some of these proposals are now being evaluated, and others will be tested in the near future. We have accordingly chosen to describe the definitions and the methodology used from 1980 to 1990, together with the main proposals for revision, rather than detailing current definitions and methodology, which are a hybrid of old and the new.

## *2.2. Definitions and methodology, 1980-1990*

### *2.2.1. The information*

The survey unit is the household, as listed at the registry office (we term this the "legal" household). As two or more legal households may be joined by family ties and live together, this definition generates a different distribution of households by size from the Bank of Italy's estimates. The difference between legal and de facto households was also pointed out by Istat's 1983 survey on family structure and behaviour <sup>(8)</sup>.

Problems arise when two or more families are registered separately but live under the same roof and share all or part of their income for consumer purchases (i.e., they do not have independent "balance sheets"). In this case, a share of total consumption expenditure had to be imputed to each legal family. To remedy this problem, since 1988 the de facto household has been interviewed as a whole but the data have been subsequently post-stratified by household size, using registry office figures as an external yardstick.

During the eighties the consumption expenditure survey involved a complex, three-form questionnaire. The daily expenditure form and the self-consumption form were completed by the household, and a form summarizing expenditures was filled in by the interviewer. A total of about 200 expenditure items were recorded.

The survey was conducted over a period of 30 days. During the first 10 days households completed the daily expenditure and self-consumption forms. At the end of the period interviewers checked and summarized the daily expenditures, collected data on household characteristics, ownership of houses and cars, ownership and purchase of selected durables over the 90 days preceding the interview, and purchases of other goods, services and durables in the last month. Finally, households were asked to select from a number of classes those best representing their total monthly income and annual savings.

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(8) According to registry office records, the share of one-person households was 20.7 per cent among persons aged 65 to 74, and 32.1 per cent among those older than 75; when de facto families are considered, these proportions drop to 16.4 and 25.0 per cent, while the overall average household size rises from 3.0 to 3.2 persons (Istat, 1985).

### 2.2.2. *Sample design*

The sampling procedure uses a two-stage stratified design. Until 1991 all provincial capitals and municipalities with 50,000 inhabitants were included as self-representative municipalities (SRM). SRMs participated every month. The remaining municipalities, or non-SRMs, were stratified by population, prevalent economic activity, and type of terrain. Three non-SRMs per stratum were selected and each participated in the survey once a quarter. Every year one third of the non-SRMs were replaced. Since 1991 the replacement of non-SRMs has been deferred pending an overall revision of the sample design <sup>(9)</sup>.

In the second stage, during the eighties, about 3,000 households were randomly selected every month from the list of household heads prepared (but not fully used) to replace non-respondents to the quarterly labour force survey. In 1991 this method was abandoned; households are drawn directly from the registry office records and the selection is independent of LFS.

### 2.3. *Recent changes and forthcoming experiments*

The main survey-specific issues concerning SFB are the reference period for expenditure items and the sample design (cross-section or panel).

During the eighties, the survey's reference periods varied according to expenditure item. Some purchases were recorded daily over a period of ten days: a three-month reference period was used for some durables, one month for others.

On the whole, the reference periods appear to be quite short. Households have reduced the frequency of their purchases, going more often to supermarkets rather than small shops and increasing their stocks of non-durables. Shopping tends to be concentrated on week-ends. The ten-day reference period is thus not only short but also out of phase with the purchase cycle. Some researchers have accordingly proposed lengthening the period to 14 days. This would be helpful but would also substantially increase the burden for the respondent. Istat plans a pilot study to evaluate the issues and effects.

The reference period for durables will also be lengthened to cut down the great variability of the estimates of rare events. The current plan is to extend it to 12 months.

However, a longer reference period raises some important issues. Measurement error may increase, owing to failure of respondents to recall purchases and misdating of those that are remembered. A detailed list of durables may assist memory, but it is not likely to solve the problem.

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(9) As is pointed out by Filippucci and Marliani (1992), the number of municipalities could be reduced without significantly increasing standard error; cluster analysis could be used to define more homogeneous strata.



Information on durables should not be collected at the end of the reference period, unless households agree to keep their receipts or other expenditure records over the whole period. Alternatively, to safeguard against misdating a bounding interview could be taken, using a panel design. Respondents would be asked to report the durables they purchased in a given period prior to the interview. The purchases reported in the second interview would be checked by interviewers to make sure they did not occur before the actual reference period.

This latter approach appears preferable. A panel survey would not only improve data quality but also contribute to a better understanding of consumption behaviour. The longitudinal age profile of consumption and income could be more accurately estimated. In a life-cycle setting one could examine how changes in household structure affect consumer behaviour. The survey unit could be based on the concept of "extended" family, permitting an evaluation of the importance of altruism in explaining consumption decisions. In this framework, if a household splits into two or more households (as children get married, for instance) each new family should be re-interviewed.

A longitudinal survey would also make it possible to estimate the persistence of poverty among different households and analyze the factors determining transitions from poverty to non-poverty and viceversa.

There is no clear agreement on the panel design. A longitudinal survey requires greater efforts than a cross-sectional one. The Bank of Italy's Survey of Household Income and Wealth, for example, is plagued by very low response rates in the panel section. Even considering that participation in SHIW is voluntary while it is compulsory in SFB, it is hard to deny that a panel design would lower the SFB response rate.

In a longitudinal survey, interviews should be conducted more professionally (a point we will consider in section 4), with correspondingly higher costs of data collection. The data quality controls should be modified to ascertain the consistency of information collected in different times and to allow for changes in the composition of households.

### **3. The Labour Force Survey**

#### *3.1. A brief history*

After initial experimentation in the mid-fifties, Istat's Labour Force Survey (LFS) has been conducted every quarter since 1959, growing progressively broader and more informative. Unfortunately these improvements have repeatedly created breaks; otherwise the LFS series would be unique in Italy for length.

The purpose of the survey remains macroeconomic: gathering information to estimate employment and unemployment.

For unemployment, there is no administrative source of comparable quality in Italy. The State Employment Service register of job-seekers

increasingly includes people who enroll for collateral advantages <sup>(10)</sup>; furthermore the present law regulating the Service (Law 56/1987) does not prevent the employed from registering.

As for employment, by definition administrative sources do not cover the "underground economy" (which all observers concur is very sizable). Also, even now employment information is only available with long lags. Moreover, the peculiar estimates of employment currently used in the Italian national accounts are based on a combination of data from households and data from firms <sup>(11)</sup>.

Changes in the survey over time have been due both to refinements or revisions in the rules for identifying employed persons and job-seekers, and changes in the richness of the questionnaire or the methodology of sampling and extrapolating the results to the entire population. The most recent changes have involved three major breaks:

- 1) In 1977 the questionnaire and the definitions used to identify people in the labour force were broadly revised to include as employed individuals with irregular and unstable job attachments and, as job-seekers, those of non-occupational status (students, housewives) and only minor (and not recent) job-search actions.
- 2) In 1984 the questionnaire was revised again, with an additional section for each household member of working age <sup>(12)</sup>, and additional emphasis was placed on job search. This may have contributed to a further upward revision in the estimate of job-seekers; while retaining the same questionnaire and definitions, in 1986 unemployment (and labour force) were adjusted downward by excluding from the job-seekers those individuals who did not specify the actual nature and timing of their job-search actions <sup>(13)</sup>.
- 3) In October 1992 the questionnaire was further enlarged <sup>(14)</sup>, with a much finer occupational and sectoral breakdown for employment; minimum working age was raised from 14 to 15; job-seekers were

(10) Regular unemployment benefits never depended on registry with the Service and have traditionally been very small in any case. But enrollment entitles one to some other advantages (such as public transport discounts and health expense rebates). Moreover, registrants benefit from several marginal employment subsidies, so many people register while still at school or remain on the rolls, i.e., do not cancel their names, while working.

(11) After partitioning the overall market into cells, Istat compares household and firm data for each cell and takes the higher figure as correct. When firm data are higher, the difference is assumed to represent job positions held by workers with more than one job. In the opposite case, the difference is attributed to «irregular» activities, reported by households but not included in the official accounts of firms. The obvious risk of such a procedure is that of magnifying measurement error and imparting an upward bias to aggregate estimates.

(12) Previously there was a single questionnaire, with a row for each member of the household.

(13) This revision went mostly unnoticed notwithstanding its significance: for July 1986, for example, it produced a drop of around 1 percentage point in the aggregate unemployment rate.

(14) From 8 to 13 questions for the household section (with a row for each individual); from 8 to 56 questions for the individual section for each person of working age.

redefined as individuals reporting a job-search action in the last month<sup>(15)</sup>. These changes have made it impossible to have a consistent series over time. The information previously available on the timing of the respondent's last job-search action is of no direct use for revising even the aggregate estimates of the earlier surveys. In fact, the range of job-search actions listed in the questionnaire has been further extended<sup>(16)</sup>; moreover, the new wording of several questions and their sequence may have prompted individuals to focus their attention on actions taken during the last month. Therefore, while we have comparable figures for job-seekers from 1959 to 1991<sup>(17)</sup>, no reliable comparison can be made with the following period (a provisional estimate of the most important aggregates, and employment has been provided by the Bank of Italy in its Annual Report presented the 31th of May, 1994).

Indeed, as far as comparability is concerned, the most recent years, the most important for cyclical analysis, have been particularly unfortunate. In 1991, the techniques for extrapolating the results were modified. External information on both the sex and age structure of the population is now used to eliminate a downward bias previously present for both employed persons and job-seekers<sup>(18)</sup>; unfortunately, figures comparable with the new methodology are only available for 1990. Moreover, one of the four surveys conducted in 1992 was taken in May, instead of April, thus preventing the identification of seasonal factors. Finally, starting from January 1993 the new census data (which differed from the registry office records by about a million in total population) have been used to post-stratify the sample.

Other important modifications have involved the sample size. After 1980 the sample was gradually expanded to nearly 150,000 household units, almost twice the already sizable sample decided in 1977, in order to get reliable information at the sub-regional level. The unmanageability of such a large survey, with a heavy questionnaire and the actual conduct delegated to local municipalities (which use non-professional interviewers and are not under the direct control of Istat), eventually prompted a cutback. Now around 70,000 units are surveyed, still a very considerable number.

Finally, in 1992 more sophisticated techniques of imputing missing data were introduced. It is still too early to assess the effects of the new probabilistic procedure adopted to replace the old deterministic method.

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(15) Previously the reference period was six months, with no limit at all for respondents who reported that they were registered with the State Employment Service (and did not work during the reference week) or were entered in public sector employment examinations.

(16) With more detailed timing of participation in public sector employment examinations and enrollment with the Employment Service.

(17) The data for 1959-1976 were revised according to the 1977 definitions; the adjustment made in 1986 was applied to the 1984-1985 period in order to reduce the risk of overestimation induced by the 1984 changes. Some problems of comparability also exist for the 1990-1991 period (see below).

(18) The bias was due to the fact that households with younger and more active members are less likely to be contacted (Ghellini, 1990).

### 3.2. Definitions and methodologies

Sample design resembles those described in the previous sections. Historically, in fact, LFS was the prototype for the other surveys: the two-stage scheme, with stratification of the first stage units, i.e., municipalities <sup>(19)</sup>, and random selection from registry office records of the households in the second stage. Each household stays in the sample for 16 months and is interviewed four times, in the 1st, 4th, 13th and 16th months. As the survey is conducted quarterly, a longitudinal comparison with the previous survey and with the same month of the previous year is thus possible for about half the sample <sup>(20)</sup>.

The extrapolation procedure does not exploit this longitudinal capability. As we have seen, the aggregates are now estimated with the assistance of external information on the sex and age structure of the population, together with cross-sectional survey results. Only a few studies have utilized the panel structure owing to the limited availability of the micro-data <sup>(21)</sup>.

By international standards, a peculiarity of the Italian LFS is the simultaneous presence (since 1977) of two channels of identification of employed persons and job-seekers. First, individuals are asked to classify themselves as employed, unemployed workers (i.e., having lost a previous job), first-job seekers or non-occupational status (students, housewives, pensioners etc.). But there is also a set of questions bearing on actual work activity during the reference week, on job-search actions during the last month and on the respondent's willingness to start work "immediately". In this way Istat recovers an additional group of workers (the "undeclared employed", i.e., people who actually worked some hours during the reference week but did not classify themselves as employed) and an additional group of "other job-seekers", i.e., people who were effectively interested in a job (according to the rules for defining a job-seeker) but had defined themselves as students, housewives, etc.

The new questionnaire asks for detailed information about job experience (the present job for the employed, any previous professional experience for those not currently working); job-search actions (for both employed and unemployed); the kind of job desired and the reason the

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(19) The smaller municipalities (i.e., those with fewer than 20,000 inhabitants) are randomly selected and rotated over time (one third per year, the change being made with the summer survey). The larger municipalities are permanent parts of the sample.

(20) The observations concerning the same individual in two different surveys are paired using the household code and the age and sex of each household member (Moriani, 1981). Successful experiments with alternative procedures have been reported by Giusti, Marliani and Torelli (1990); however, the estimated transition flows in the market vary only marginally from one procedure to the other.

The possibility of measurement errors in the flow estimates obviously remains high, especially for individuals in the grey area between working and not working. Moreover pairing is impossible, by definition, for households that have moved (the survey does not follow the movers).

(21) See Torelli and Trivellato (1990), for a micro-analysis, and Sestito (1988), for a macro-analysis.

respondent does not search; training activity and the employment position held one year earlier.

Most of the LFS data about currently held jobs has almost no counterpart in other Italian statistics (plant size, job tenure, working hours during the reference week and usual working hours, temporary or part-time nature of the position). The immense detail of the sectoral and occupational breakdown for both the main job and second job (if any) has created a number of problems in managing the survey; the sectoral breakdown of employed persons as now estimated is not comparable with those before October 1992.

Job aspiration items include the desired number of working hours, whether temporary or permanent employment is sought, the respondent's willingness to move and, finally, a question designed to disentangle the question of the "reservation wage".

### 3.3. *Issues and suggestions*

LFS responds to multiple purposes: (i) to provide aggregate estimates of employment and unemployment, comparable over time and with their counterparts internationally, and available with a frequency and promptness consistent with the requirements of business cycle analysis; (ii) to give detailed information about the geographical and sectoral disparities in the Italian labour market, more in order to depict the structure of the market than to analyze the cyclical position of the individual micro-areas <sup>(22)</sup>; (iii) to permit micro-analysis of individual and household behaviour.

The usefulness of the survey for cyclical analysis is diminished by the long lag before the results are released and by its only quarterly frequency. The lags depend on the survey's large sample size, heavy questionnaire and the inefficient governance structure. These factors explain why so far a more frequent survey has been deemed virtually impracticable.

Moreover comparability of the aggregate estimates over time has very often been neglected. Any complex survey must be subject to change and refinement: both theory and experience continuously suggest new issues for inquiry and new statistical methodologies to be exploited. When a change is introduced, however, there must be some effort at prior assessment of the likely impact, so as to permit comparison between the old and the new estimates, at least for the most important aggregates. On the contrary, the revisions introduced as of October 1992 furnish a clear example of *mismanaged change* <sup>(23)</sup>.

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(22) Of course, counter-cyclical macroeconomic policies are conducted at the national level.

(23) It is unclear whether comparability over time has also been adversely affected by the probabilistic imputation of missing data also introduced in October 1992. The finer breakdown of employment has generated a sharp increase in missing information. In an

For micro-analysis the lack of wage, income and wealth data is an obvious impediment, although this may have helped encourage participation, thus making it possible to have such a large sample <sup>(24)</sup>.

The quality of the data does not appear to bear disaggregated analysis. Furthermore quality of the survey is presumably highly uneven in geographical terms, depending as it does on the structure of governance of the survey, the use of non-professional interviewers and the intervention of the local municipalities. The recent reduction of the sample size may have helped, but the enlargement of the questionnaire has exacerbated the problem. Paying the interviewers, as has been done since October 1992, is no solution if Istat cannot control what they actually do.

Achieving all these goals, or a compromise among them, requires an integrated framework, and possibly more than a single instrument. For cyclical analysis, the sample should be reduced, the questionnaire shortened and the frequency stepped up. But the geographical detail desired would require enlarging the sample, while micro-analysis needs a lengthier, more detailed questionnaire. A more frequent survey (say, monthly) could be conducted with a small sample and a simple questionnaire. A less frequent survey (say, yearly) could be based on a larger sample, so as to obtain the detailed geographical breakdown. More ponderous questionnaires for specific micro-analysis, including some income items, could be prepared for specific sub-samples, using supplementary sections and following a rotating scheme. And in these aspects, greater use could be made of the survey's longitudinal potential.

Improving data quality, we feel, would require the design changes just now described. Ensuring comparability over time demands a change in mental habits; given the uses of LFS, we think this is a central issue. One possibility might be to make available several employment and unemployment estimates using different definitions; this could prove helpful, especially in transitions from one methodology to another.

#### **4. A More Closely Integrated Framework**

After examining the three surveys singly, we now turn to issues that are not survey-specific but relate to the design of a more closely integrated framework.

We identify four main areas of concern: comparability (between surveys and over time), the weakness of the data collection step, the lack of important variables in each survey and the use of the micro data.

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effort to alleviate this problem, interviewers' pay has been made conditional on the presence of the occupational and sectoral items.

(24) In theory, participation in Istat's surveys is compulsory, but the effective compliance and willingness cannot be taken for granted. Because of theoretically compulsory participation, we know much less about non-response in these surveys than in SHIW.

The definitions, concepts and methodologies of the three surveys need to be put on a comparable basis. For example, the basic survey unit (the household), suffers definitional disparities that hinder comparison between surveys. The same definition should be used in all three surveys. Probably, de facto households should be interviewed, to avoid the necessity of imputing some aggregates (e.g., expenditure components) to members registered in different households. However, questions on how household members are registered at the registry office should also be included in order to permit the survey data to be related to official registry figures.

The additional information on registry status would make it possible to report household size according to both the de facto and legal household definitions. The latter (instead of the former) could then be used to post-stratify survey data, using the registry office figures as an external yardstick.

Moreover, a posteriori strata could be defined by supplementary classificatory variables (generalizing, that is, the current LFS practice of utilizing the age structure of the population, as reported in the registry office records). Estimates based on the largest of the three samples could be used as post-stratification variables as well (for example education, job status and broad sector of activity of household members) <sup>(25)</sup>.

Comparability over time has often been neglected (especially in the case of SHIW and LFS). Owing to its macro uses, this shortcoming is most severe for LFS.

In all three surveys, the main difficulty with data collection stems from the interviewers. For LFS and SFB, the problem is presumably connected with the structure of governance of the survey, the lack of professional interviewers and the intervention of the local municipalities. This structure and Istat's limited powers affect the quality of the survey adversely. SHIW assigns the field work to a market research company, and the interviewers are not under the control of the Bank of Italy. Most are professional interviewers, which should be a guarantee of quality. But there was a striking drop in the overall response rate in 1989, when it was decided that interviewers would be paid for information concerning non-responding units, which casts some doubts on the quality of the field work.

The Bank of Italy introduced an interesting procedure for the 1991 SHIW. A different company was put in charge of external auditing, thus generating independent information about the quality of the field work and acting at the same time as a motivating device, as the interviewers knew they would be checked. This device is not likely to prove feasible in the case of Istat, however, with its more numerous surveys and far larger samples. A conceivable solution might be external professional interviewers trained and supervised by Istat staff.

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(25) A further issue, more administrative than statistical in nature, is the deterioration in the quality of the registry office records experienced over the last decade, which has been highlighted by census data.

In each survey, some important variables are missing or subject to limitations and bias. The behaviour of individuals and households in the labour market cannot be fully analyzed without knowledge of their income and wealth; but in LFS no income and wealth data are collected. In SFB income plays an important role in explaining the consumer behavior, and greater attention should be paid to this variable. Since the survey focuses on monthly income, the danger is underestimation. Respondents' attention could well be drawn too narrowly to revenues accruing monthly; if this is so, interest, dividends and other seasonal, annual or non-periodical incomes would be neglected. Therefore more and more detailed questions concerning income should be asked, if possible for each household member. Istat is moving in this direction, and the questionnaire for 1994 will probably include many additional items on individual incomes. Similar considerations apply, *mutatis mutandis*, to SHIW.

Some remedies for individual surveys have been proposed, but the problem might be more effectively handled by combining surveys. Each, of course, must remain basically tied to a specific issue, but a subsample of one survey could be made to coincide with a subsample of another, after harmonizing definitions, concepts and methodologies. Thus, for example, the distribution of income, wealth and consumption would be measured in the subsample common to SHIW and SFB.

This objective may be difficult to achieve, not only because different institutions would be involved but also because of the heavy burden it would place on the subsample households. Alternatively the surveys could be linked by matching procedures. A joint working party formed by two government commissions of inquiry (on poverty and emargination and on social impact of regulatory provisions) had undertaken this project, with encouraging preliminary results. However, the research broke off with the expiry of the commissions. The method proposed hypothesized that the SFB data on consumption expenditure were not biased while those of SHIW were misreported. The two samples were divided into a number of groups according to selected characteristics available in both surveys (for example sex, age, education, job status of the household head, number of children, family size, home ownership). Adjustment coefficients, computed for each group as the ratio of average SFB consumption expenditure to the corresponding SHIW figure, were used to correct the total consumption expenditure of each household in the SHIW sample (Citoni et al., 1991).

As a first step towards a more integrated framework, in any case, published statistical tables should be put on a generally comparable basis. In other words, the statistical breakdown should be based on a large set of identically defined classificatory variables, facilitating the application of estimation procedures using data from different sources (Angrist and Krueger, 1990; Arellano and Meghir, 1990).

It would also be worth some effort to improve comparability between the surveys and administrative sources. The use of the latter for statistical purposes is still virtually unexplored territory in Italy <sup>(26)</sup>. Comparability at the individual level is obviously constrained by the requirement of

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(26) An economic analysis based on social security data has been performed by Contini et al. (1992).



anonymity and confidentiality. But for aggregate estimates of specific population subgroups, such comparison is a feasible project.

A final observation relates to the availability of micro-information for empirical research. Collecting data that can be used for micro-analysis is one of the purposes of this kind of survey; moreover the analysis of micro-data made by independent researchers is one of the best sources of ideas for improving statistical design. With this in mind, Istat's rethinking – already undertaken – of the purpose of SFB appears to be very useful. Closer coordination between the institutions that collect statistical data and the researchers who use them would allow more precise determination of which data need to be gathered to test economic hypotheses. In this way, the design could be revised to obtain an optimum sample with respect to one's specific aim.

At present only the SHIW makes micro-data available. This is one reason why, despite its potentially great analytical and statistical importance, the longitudinal nature of a survey like LFS has remained largely unexploited.

Thus, the creation of readily consultable public files extracted from LFS and SFB (obviously, guaranteeing anonymity) would be a major contribution to economic and statistical inquiry.

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## SUMMARY

*The paper describes the Italian sample surveys on income, wealth, consumption and the labour force. Two sections cover the Bank of Italy's Survey of Household Income and Wealth (SHIW) and Istat's Survey of Family Budgets (SFB), both of which inquire into income and consumption, but with differing purposes and methodologies. SHIW gathers detailed data on income, with separate questions for each household member, and only a few questions on consumption, designed essentially to check for internal consistency. SFB surveys the household as a unit, focusing on detailed consumer spending data. Its questions on income and savings are essentially conceived as a by-product. SHIW and SFB are thus complementary rather than overlapping. The third section treats Istat's Labour Force Survey. A brief account of the many definitional changes it has undergone over the years is followed by a discussion of present methodology and such key shortcomings as the exclusion of income and wealth variables, poor comparability over time, and only quarterly frequency. Each section offers survey-specific suggestions for improvement. Finally, section 4 contains some proposals for a more integrated overall framework (i.e., greater attention to comparability over time, harmonization of definitions and methodologies between surveys, and better integration with administrative data).*

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# SUSTAINABLE DEVELOPMENT AND OFFICIAL STATISTICS: THE ISTAT-FONDAZIONE ENI-E. MATTEI PROJECT (\*)

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## 1. Introduction.

Recent evidence points out that the economic and the environmental systems cannot be considered as decoupled realities, especially as far as economic and environmental policies are concerned. In fact this is increasingly recognized by both theoretical economists and environmentalists. The concept of factor of production in economic theory is not restricted to labour and capital, but is quite often extended to include the environment; several environmentalists, on the other hand, share the opinion that economic development can be helpful to solve environmental problems, a topic that is also the subject of much recent theoretical research in economics. As to policy considerations, it is easy to notice that, given the international dimension of the interrelations between the economy and the environment, in the international negotiations there is more and more room for ecological targets besides the economic ones; the "polluter pays principle", furthermore, is being introduced in legislation and economic practice.

As it is widely agreed, the economic and the environmental systems can evolve in harmony only if development is sustainable. According to the "Brundtland Report", making development sustainable means to ensure that it "meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987). Much emphasis has recently been put on this political idea through the UN Conference on Environment and Development (1992, in Rio de Janeiro). The principle stated by the UN Commission in 1987 reflects the international debate on the links

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(\*) The whole paper was prepared jointly by the authors; however Sections 1 and 3 can be attributed to Cesare Costantino, while Section 2 can be attributed to Andrea Beltratti and Section 4 to both authors.

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between economy and environment deemed relevant for future generations. With reference to this, two fundamental aspects can be taken into consideration: a) ecological problems due to economic growth, given the interrelations which determine the international distribution of income; b) environmental issues substantially depending on how activities and economic results are distributed at the international level. The comprehensive consideration of both the mentioned aspects would probably be the most correct way for addressing topics concerning sustainable development. Apart from that, however, it is essential to analyse the interrelation between the natural environment and economic growth even without going into distributional aspects. These latter are ignored in the present paper, that mainly focuses on practical ways of designing a system of official accounts based on the concept of sustainable development.

Even if the principle of sustainable development seems to be quite clear on a conceptual ground, there is the need to further specify it before arriving at more operational definitions. This is particularly important for developing official statistics on this subject. Several different statistical definitions can be obtained, in fact, starting in particular from concepts provided by the neoclassic economic theory (Pezzey, 1989). One of the proposed definitions, which refers to "environmentally sound and sustainable economic growth" reads: "growth of (real) net domestic product that allows for the consumption of produced capital and the depletion and degradation of environmental assets, to the extent that depletion and degradation are not offset by technological progress, discoveries of natural resources or change in consumption patterns" (Bartelmus-Stahmer-van Tongeren, 1991). The conceptual categories included in the mentioned definition can be looked at as key-words to go into the subject dealt with here.

Following the recommendations of the "Brundtland Report", OECD started to include the concept of sustainable development in its own political programme. Integrating environmental and economic policies has therefore become one of the guidelines of the OECD strategies. The need of a general awareness of environmental issues, at each decision-making level, and of a dialogue between economists and policy makers on the one hand and environmentalists on the other hand have been stressed more and more by OECD, while the development has been recommended of systems of environmental accounts as tools aiming at describing the interaction between the economy and the environment (OECD, 1991). Suitable statistical information should be developed in particular, according to OECD, on expenditure carried out against pollution, benefits of environmental policy, costs due to environmental damage, stocks and flows of environmental assets. Last but not least, it is worth stressing that the European Communities supported the conclusions of the 1992 UN Conference on Environment and Development (widely known as Agenda 21). Furthermore, a European strategy for environmentally sound and sustainable development is included in the 5<sup>o</sup> Action Plan for the Environment issued by the Commission (Commission des Communautés Europeennes, 1992). The development of a European system of

environmental accounts is then proposed at an experimental stage for 1995, while the adoption of official accounts at the European level is envisaged for the end of this decade.

Due to the growing awareness of the interrelations between the economy and the environment, a remarkable demand for statistical information on this subject is arising; in this situation, the definition of guidelines for official environmental accounting is to be considered of great concern for the Italian National Statistical Institute (ISTAT), besides the production of official data. ISTAT started its activity in the field of the environment in the '80s and in 1985 issued its first compendium of environmental statistics. During the last three years the ISTAT unit that is involved with the environment has been focussing, among other things, on the links between economy and environment. The final goal attached to this new research activity is to meet the growing demand for statistical data related to the concept of ecologically sound development; that is envisaged to be obtained through the construction of an ad hoc accounting system. One basic element of this work is the participation in the activities carried out in the field of environmental accounting within the main working groups set up by the international organizations.

Official statistics dealing with sustainable development are not necessarily issued by ISTAT in Italy, since the Italian National Statistical System (SISTAN) includes other bodies which produce statistics besides ISTAT. Among these, the Ministry of the Environment is to be mentioned in particular; it is responsible, in fact, for providing information on the state of the environment and produces a report on this subject to be presented to the Parliament (Ministero dell'ambiente, 1992). ISTAT and the mentioned Ministry, as well as other important public bodies, have joint projects as far as subjects of common interest are concerned and this applies in particular to environmental accounting. Any activity carried out within SISTAN, furthermore, is reflected in some way in ISTAT activities, since this latter is at the top of SISTAN. The present paper focuses then, while dealing with official statistics, on ISTAT projects and refers in particular to a joint venture carried out by ISTAT and Fondazione ENI Enrico Mattei (FEEM). The Fondazione ENI Enrico Mattei was established in 1989 as a non-profit, non-partisan research institute. The main objectives are twofold: furthering research on the relationships between energy, environment and economic development and promoting interaction between academic, industrial and public policy spheres to find solutions to environmental problems.

On the basis of a common concern in this field, by the end of 1991 ISTAT and FEEM started a joint venture for developing a system of environmental accounts. A Commission of experts was then set up to that end, with the specific task of studying the necessary methods. The first intermediate report of the Commission was finalized at the beginning of this year (Musu and Siniscalco, 1993); the main issues pointed out in the report are discussed in the present paper.

Section 2 of the paper presents a detailed account of some theoretical developments that are useful to understand the theory behind environmental accounting, in particular its welfare foundations. The

possible implementation of such a theoretical framework for the Italian case is then discussed in Section 3.

## **2. From Environmental Economics to Environmental Accounting: Some Theoretical and Practical Issues.**

This section analyzes a static model that includes some simple interrelations between the environment and economic activity; such a static framework is very useful to study the importance of defensive expenditures and other variables that play a key role in the definition of various practical measures that are to be considered in the environmental accounts. Such a model can therefore be used to examine some of the proposals for corrections of the national accounts aggregates that are based on considering the environment as a stock of natural capital that provides services of various types to consumers.

### *2.1. The basic structure of a static model.*

In the model the environment enters both the utility and the production functions. The role of exhaustible resources cannot be considered in this context, and requires instead the use of a dynamic model that will be discussed next. The environment is to be thought of as a stock  $Z$  that is spoilt by production activities by firms. In the standard model, see for example MÄLER (1990), pollution by firms, denoted with  $s$ , is considered as an input in the production function  $F$ , together with labour  $l$ , and the stock of environment left after production has been carried out  $A = Z - s$ :

$$y = F(l, A, s) \quad (1)$$

Such a specification was introduced by Brock (1977), that justified it by explaining that pollution and wastes are an input to production in the sense that by ignoring negative environmental effects of productive activity firms may use inputs like labour for the primary activity of the firm. A certain part of labour and capital would instead have to be diverted from productive purposes to cleaning purposes if the firm were obliged to manage waste in an appropriate way. Therefore for a given level of inputs, the larger the waste the larger the production obtainable from the inputs. Function (1) has therefore to be interpreted as a reduced form for the description of the relationship between production and environment.

As to households, it is assumed that they may carry out some defensive expenditures by using labour in the amount  $n$  and goods in the amount  $q$ , in a household environment production function:

$$a = G(A, q, n) \quad (2)$$

The model describes a situation in which households can protect against the negative effects of production; for example production takes



place in a city, and people can use time and produced goods to go to the countryside during weekends to enjoy a cleaner environment. Of course firms do not benefit from such type of defensive expenditures, so that  $A$  is the quality of the environment that affects production. The model is completed by the specification of preferences,  $u(a, C, m)$ , that are also defined with respect to consumption of goods,  $C$ , and leisure in the amount  $m$ .

## 2.2. The decentralized solution.

In the decentralized equilibrium the representative firm maximizes profits,  $py - wl$ , where  $p$  is the price and  $w$  the wage. Lacking any property right on the use of the environment as a waste recipient the firm will optimally choose  $l$  and  $s$  in such a way that

$$p (dy/dl) = w \quad (3)$$

$$p (dy/ds) = 0 \quad (4)$$

The two equations describe the general rule according to which marginal costs and marginal revenues have to be equal for a choice to be optimal. Such a rule is applied to the use of labour and to the amount of wastes: the marginal productivity of labour has to be equal to the wage, and the marginal productivity of emissions has to be equal to 0, implying an infinite amount of waste. In a competitive sector where each firm ignores its own contribution to the general deterioration of the environment (the case of global pollution), the net result will be an overexpansion of production and an overemployment of labour for productive activities. Note that if production were carried out by a single large monopolistic firm, the condition for the choice of labour would take into account the negative effects of production on the environment, so that part of the labour would be used to treat wastes, with an overall welfare improvement.

Households take as given both prices and the decisions of the firms on production and factor utilization; they solve:

$$\max u [G(Z - s, q, n), C, m]$$

$$\text{subject to } p (q + C) = w (L - l - m - n)$$

Some of the necessary conditions for the maximization that are relevant for the problem under consideration are:

$$(du/dG)(dA/dq) = p \quad (5)$$

$$(du/dG)(dA/dn) = w \quad (6)$$

$$(du/dm) = w \quad (7)$$

that describe the allocation of time to various purposes. From the previous necessary conditions one can obtain demand and supply functions; in order to solve for the decentralized equilibrium one has to use the aggregate resource constraints specifying that the various uses of time must sum up to the total availability  $L$ , while consumption of goods for the various purposes cannot exceed total production:

$$L = l + m + n \quad (8)$$

$$y = q + C \quad (9)$$

From these equilibrium conditions and the various demand functions it is possible to derive equilibrium prices and quantities.

### 2.3. *The index of welfare.*

For illustrative purposes, and ignoring all issues related to aggregation of preferences, welfare will be taken to be equal to utility. Since in general the utility function is non-linear, it may be useful to linearize the utility function around the competitive optimum to derive a welfare index (WI) that is linear in the quantities:

$$WI = (du/dA)(dG/dA)Z - (du/dA)(dG/ds)s + (du/dA)(dG/dq)q + \\ (du/dA)(dG/dn)n + (du/dC)C + (du/dm)m \quad (10)$$

It is interesting to compare the index with the value of the GDP as measured under current accounting conventions:

$$GDP = (du/dA)(dG/dq)q + (du/dC)C \quad (11)$$

The comparison of (10) and (11) points out that current conventions ignore some terms that are important for the evaluation of welfare:

- the value of leisure;
- the value of time devoted to defensive activities;
- the value of the stock of environment;
- the value of the damage to environment caused by production.

It is now possible to evaluate the proposals for environmental accounting that are based on the subtraction of defensive expenditures, in an attempt to approximate the actual damage caused by production, the term  $-(du/dA)(dG/ds)s$ , with the value of defensive expenditures,  $(du/dA)(dG/dq)q$ . The goal is to obtain a measure of "green GDP" (GGDP):

$$GGDP = (du/dC)C = GDP - (du/dA)(dG/dq)q \quad (12)$$

Some comments are now possible with respect to this proposal:

(a) the practical relevance of this approach rests on the practical validity of the assumption of perfect competition and therefore of the hypothesis that market prices reflect relative scarcities. The presence of monopoly or oligopoly would break the connection between prices and marginal utilities and would decrease the importance of this approach.

(b) for many environmental goods it is hard to think of defensive expenditures that are feasible on the part of each single agent. For the example of air pollution in large cities it is difficult to see what types of defensive expenditures are feasible at the individual level (apart from living in the countryside). In this case  $(dG/dq) = 0$  and there are no defensive expenditures at all, regardless of the value of the damage.

(c) Many environmental problems can be faced only with collective action or with policies that stop pollution altogether. It is then difficult to see the usefulness of an environmental accounting that depends on those same actions that should refer to the output of the accounting process as a justification.

(d) "green GDP" has no connection whatsoever with sustainable GDP, a concept that can be defined only with the help of a dynamic model.

#### *2.4. What is income?*

The model described up until now is certainly useful for a first definition of the relevant variables, but ignores the existence of stock of natural and man-made assets, like for example the environment and capital. If production takes place by means of such assets, or if society attaches some utility to any of them, it becomes essential to modify the definitions that have been given before in order to allow for use and depletion of stocks. This is indeed the basic point that was made by Hicks (1946), when stating that the main purpose for calculating income "in practical affairs is to give people an indication of the amount which they can consume without impoverishing themselves. Following this idea, it would seem that we ought to define a man's income as the maximum value which he can consume during a week, and still expect to be as well off at the end of the week as he was at the beginning". Therefore income is a guide for a prudential policy. The problem discussed by Hicks of course cannot be dealt with in the static context described in the previous model, where economic activity is assumed to take place in a timeless context. The existence of stocks however implies that economic activity affects the final value of the stocks, so that for a proper accounting of all its consequences it is necessary to account for the change in the stock. This raises important issues about how to precisely define income in such context.

A suggestion in how to go about this measurement comes from the observation that the definition given by Hicks is not independent of a rationality hypothesis about the behavior of the individual. In fact behind Hick's definition lies the concern that the consumption decisions followed by the individuals are too short-sighted, and therefore are taken at the expense of the possibility of consuming in the future. Income must have the normative meaning of signaling the individual that the consumption choices are not sustainable for the future. Note that such unsustainability may well be the result of a conscious choice on the part of the individual, who may well decide to consume immediately a larger share of her

resources. In this case she will not worry about realizing that her income may be lower than her consumption, since she is already planning to reduce consumption in the future.

Weitzman (1976) formalized the concept in an analytical model involving the possibility of consuming or investing in a physical asset. The model has recently been extended by MÄLER (1991) to account for the effects of production on the depletion of reproducible and non-reproducible assets like the environment. There is no point here in going through the analytical derivation of the solution, that is obtained with the optimal control technique based on the Hamiltonian function. In informal terms, it may be said that the Hamiltonian, from which the necessary conditions of the problem may be obtained, is a dynamic counterpart to the objective function of the static problem. The Hamiltonian is in general non-linear, but an index of welfare may be derived as before by linearizing the Hamiltonian. MÄLER shows that in this case one obtains:

$$H = (du/dC)C + (du/dA)A + p(dK/dt) + q(dA/dt) \quad (13)$$

where  $p$  and  $q$  are the shadow prices of capital and environment,  $K$  is the stock of capital and  $A$  is the stock of environment. Such an index is more accurate than the one that was described in the previous Section as it includes also the value of the changes in the stocks of physical and natural resources. The new piece of information, complementary to those obtained in the previous discussion, is that also the value of the depletion of natural environment should be deducted from the index to reflect true welfare. This provides justification for the construction of an index that includes a measure of environmental damage as a further deduction to make from GDP to get to a measure of sustainable income that also reflects the effects of the actions of present agents on future agents as far as transmission of the various stocks are concerned.

This is clearly important for the definition and the measurement of sustainable development and income, and it is one way of incorporating into the analysis, and the statistics, the concern that has been expressed in the Brundtland Report towards the welfare of the future generations.

### **3. The First Intermediate Report of the Commission of Experts Set Up by ISTAT and Fondazione ENI E. Mattei for Developing an Environmental Accounting Scheme.**

The theoretical concepts described in the previous section have to be implemented. The project started by FEEM and ISTAT tries to achieve this purpose. The work carried out by the Commission resulted so far in a number of preliminary studies, ranging from analyses on principles, objectives, problems and experiences at the international level to researches on data bases available, and in an intermediate report, as mentioned above. The latter includes a set of guidelines and a research programme to be carried out with priority, proposed for the construction

of an official system of environmental accounts. The position of the Commission with reference to central issues such as the accounting treatment of environment-related defensive expenditure and "Green GDP" are pointed out in particular in the report.

The system of environmental accounts envisaged by the Commission should deal with the environment under an economic, ecological and socio-cultural profile; an appropriate description of the single parts and a complete connection of them should be provided. The system should be connectable with the National Accounts and structured on two fundamental components:

- a) satellite environmental accounts;
- b) natural patrimony accounts.

Through the satellite environmental accounts the interface between the economy and the environment would be statistically represented from an economic point of view; the natural patrimony accounts would instead provide an in-depth statistical description of ecological and territorial, as well as socio-cultural aspects.

The proposed UN System of Integrated Environmental and Economic Accounts (SEEA) is suggested as the reference general framework for the construction of the satellite environmental accounts (United Nations, 1992); as far as environment-related defensive expenditure is concerned, the European System for the Collection of Economic Information on the Environment (SERIEE) should be implemented in particular (EUROSTAT, 1992). For developing natural patrimony accounts ISTAT should profit from the experience achieved in this field by INSEE (INSEE, 1986).

On the basis of the envisaged accounting structure, and following a pragmatic approach, the Commission recommended to start with the development of a number of priority modules. According to the Commission recommendations, the first sections to be studied should concern: 1) the implementation of the SERIEE; 2) the physical accounting part of the satellite environmental accounts, with limitation to flow accounts; 3) the general framework of a system of natural patrimony accounts. With reference to all these three sections, the first steps to be taken should concern definitions and classifications. Specific accounting schemes would have to be developed initially only with reference to a few variables deemed strategically important and for which the construction of complete accounts appears to be feasible within a not too long delay.

Among the main issues pointed out by the Commission, those regarding "Green GDP" and the accounting treatment of environment-related defensive expenditure seem to be particularly relevant, as already said. With reference to this, the general orientation of the Commission being towards the distinction of a "cost-oriented" approach and a "welfare-oriented" one, it is proposed, for the moment, that ISTAT start with the construction of satellite accounts in which imputed environmental costs (depletion and degradation of environmental assets) are looked at as inputs of the income generation process, without going into welfare aspects. On the other hand, although the Commission adhered, in general and on a theoretical ground, to the UN proposals for integrated environmental and economic accounting (SEEA), it seemed to

the Commission that calculating an official figure for "Green GDP", as suggested in SEEA, would not be an advisable strategy at present. The Commission, in fact, while agreeing on the soundness of an accounting scheme which allows for environmental costs due to economic growth, at the same time stressed the risk of providing a misleading figure for "Green GDP", due to the difficulties of calculating in concrete, without making too many assumptions, one figure for depletion and degradation of environmental assets. In this situation, the recommendation given by the Commission is that ISTAT provide, for the time being, as much statistical information as possible in physical as well as monetary units with reference to the environmental implications of economic growth, so that analysts outside the official statistical system are enabled to make their own estimates of environmental damage and "Green GDP", on the basis of personal assumptions. The Commission maintained that figures relating to actual expenditure should not be subtracted from Net Domestic Product (NDP) in an attempt to obtain an environmentally adjusted NDP; what would be more correct instead, according to the Commission, is the deduction of a social assessment for depreciation of natural capital (environmental damage), which might imply the calculation of potential, and not actual, expenditure.

#### **4. Concluding remarks**

Three main topics need to be discussed:

(a) possible deduction from GDP of actual environment-related defensive expenditure;

(b) possible deduction from GDP of the value of depletion and degradation of environmental assets;

(c) the role of physical accounting.

(a) We have seen that deduction of actual environment-related defensive expenditure is only an approximation to a more correct procedure, such as deduction of the value of environmental damage. The two may be very different. In many cases in fact there is no possible defensive expenditure that can be taken for protection. In addition to that, one would have to take into account even that in practice it may be impossible to match statistics on expenditure actually carried out with the possible estimates of corresponding environmental damage. In any case, as far as the accounting treatment of environment-related expenditure is concerned, it seems to be a correct procedure to make such treatment depend on whether a "cost-oriented" approach or a "welfare-oriented" one is followed.

(b) The main issue here refers to practical suggestions for implementing the desired deduction. The assessment of depletion and degradation of environmental assets may depend on the estimated cost that should be undertaken to maintain natural capital intact. This is certainly a defensive expenditure interpretation of the correction, apart from the fact that one would here consider theoretical defensive

expenditures rather than actual expenditures. The possible deduction depends on the value that is given to the natural capital, and this reflects a judgment about the path that society should follow. It cannot be given independently of a subjective value. This therefore may require the necessity of also specifying which physical targets are looked after when a certain cost is considered. With reference to this, moreover, it is to be taken into account that knowledge on the long-term environmental implications of economic development may be not enough advanced so that environmental accountants be enabled to calculate one comprehensive figure for environmental damage and make an appropriate adjustment of GDP or NDP. The theoretical models that we have considered, and all the others in the economic literature, usually do not require permanent preservation of the stock of environment, unless substitution possibilities in production and/or in consumption are extremely low. It is then likely that the data that are needed the most are those on the physical evolution of the environment. This is our last topic.

(c) Physical accounting is likely to be very important in practice. It is the only measure that can be agreed upon by everybody. Agents may in fact disagree on the prices that are attributed to environmental goods, simply on the ground of different preferences, but may not disagree with information about physical use of the environment. This information is likely to be very important also at a local level, since depletion and degradation to an excessive extent of some local environmental assets may suggest certain precautionary measures at the local level.

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# USE OF FISCAL DATA FOR STATISTICAL PURPOSES: PROBLEMS AND FUTURE DEVELOPMENTS

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1. The tax register contains three categories of data from fiscal sources, which can be used to varying degrees in order to attain a knowledge of the underlying economic phenomena:

- a) data regarding tax receipts subdivided by balance items;
- b) basic features of the activity performed by offices within the various sectors of the financial administration;
- c) data from tax returns pertaining to different taxes.

The information from the second category is of little interest as far as the knowledge of economic phenomena is concerned: it describes the activity of offices and, more particularly, the number of dossiers dealt with, staff, resources used, time spent, results.

Within this source, the most important component is represented by the analysis of controls carried out by offices in order to assess the degree of correctness of the various taxes (IRPEF, IRPEG, ILOR, VAT, etc.); the behaviour of taxpayers is examined in relation to the declared income class and to the different categories of economic activity carried out. In particular, indications regarding the degree of positive controls and the amount of greater tax ascertained are given, leading to the creation of statistics subdivided by amount classes.

This information is available on a monthly basis, while the one regarding the activity of offices is supplied annually.

Tax receipts are calculated on the basis of the period in which they are received, and monthly indications regarding these receipts are published. In addition to the fundamental importance this information has in verifying the correlation between tax receipts and the forecasts contained in the national budget, it also represents an indicator of the trend of some macro-economic factors to which they are linked. Thus, for example, in the energy (petrol, gas oil, fuel oil, methane, electric power), and import sectors (VAT relative to extra-EC trade), fiscal data can be usefully compared with data from official statistical sources. In the same

way, as far as the total amount of wages is concerned, the use of data pertaining to tax deductions on wages in the private sector makes it possible to refer to all enterprises which disburse wages, thus obtaining a more general picture as compared to ISTAT (National Institute of Statistics) surveys, which investigate into firms with at least 500 employees.

Another useful source of information is represented by VAT receipts for domestic trade. This data, which is calculated on a monthly basis in accordance with the expiration dates of payment (the 18th of each month for taxpayers who Make monthly payments and the 5th of May, August, November and March for those who Make quarterly payments) refers to fiscal value added, which differs from the one used for national accounting.

Other information that is unavailable from other sources may be deduced from fiscal data. Among these we have, for example, the remuneration of professional persons (withholding tax, on a monthly basis) and data on the profits of enterprises (IRPEG, ILOR, on an annual basis).

The third category of data is the most fruitful as far as information is concerned. The data contained in tax returns is analysed with an average delay of around three years for income tax and two years for VAT. The financial administration thus has at its disposal an inflow of yearly information relating to aspects, including structural aspects, that can be considered in some way to be similar to the ones obtained from a census. For each enterprise the following data is available: the juridical status (individual firm, joint-stock company, association, etc.), the place where the activity is carried out, number of employees, the asset and liability statement, income, value added, etc.

At present, projects are being implemented to establish a telecommunication link between the data banks of the Ministry of Finance and the National Institute of Statistics, the body responsible for the gathering and processing of statistical data. Information obtained from the surveys carried out by ISTAT will be used to integrate the knowledge of phenomena that are of interest for fiscal purposes; on the other hand, the National Institute of Statistics will be able to gather the most significant fiscal information in order to integrate its own data, thus obtaining a clearer definition of national accounting aggregates.

The first phase – still to be completed – foresees an analysis of available information in the two bodies and its subdivision into three categories:

- information available in data banks, which can be directly accessed on-line (both ISTAT and the Ministry of Finance have data banks which can be accessed directly);
- information contained in the archives of the two data processing units which can be exchanged on magnetic stands or by telecommunication link, thanks to the connection between the two centres;
- information, not available by electronic means, which is however of interest to the two bodies.

The link between the two data banks, which can already be accessed, could be completed in the near future. However, the information available in the archives needs to be carefully examined: for example, in order to use the data of VAT declarations and tax returns for national accounting purposes, in addition to the identification of information contained in the archives, it will be necessary to clarify the different meanings given to various values (value added, income, turnover, profits, etc.).

Preliminary use of a part of available information is envisaged in the near future so as to ascertain its significance; once the validity of the information basis is verified with respect to the objectives, data may begin to be used on a continuous basis.

2. In order to reach this goal, an agreement between the Ministry of Finance and the National Institute of Statistics has been stipulated concerning the interconnection of information systems. In particular, the creation of a Commission was foreseen: this Commission has to co-ordinate activities aimed at implementing the connection of statistical bases of the tax register and ISTAT, to define the needs of the national statistical system and to identify the data and the processed data that the Ministry of Finance should put at the disposal of the national statistical system (SISTAN).

As far as this aspect is concerned, the needs of ISTAT are focused on two main themes:

- 1) the creation of a single standardised register of all enterprises, institutions and local units, and its annual updating;
- 2) the use of fiscal data in national accounting estimates.

In order to create a register of enterprises in the field of census activities, the tax register has made available an "archive" containing individual data relating both to VAT taxpayers, subdivided into natural persons and juridical persons, and to non-VAT taxpayers, who are not natural persons. In order to complete these control and verification activities, the number of employed and self-employed workers and relative wages will have to be made available.

As far as the use of fiscal data in national accounting estimates is concerned, short-term needs are primarily linked to the carrying out of estimates for the benchmark year 1992, which need to refer to fiscal data in order to integrate ISTAT's annual surveys relating to enterprises included within certain number-of-employee classes (small and very small enterprises) and within certain economic activities (personal services).

In a preliminary phase of the research, it will be necessary to verify the consistency between the individual data of a sample of enterprises possessed both by ISTAT (annual surveys and company balances, where they exist) and by the tax register (VAT declarations, tax returns: Forms 740, 750, 760, 770) in order to assess the presence of similarities in the behaviour of the unit being observed.

Subsequently, it will be possible to verify certain estimates regarding the underground economy, also with respect to the modification of the

structure of Community resources, which will require an increase of the burden of taxes on the basis of GNP.

A special Committee, aimed at verifying data comparability, has defined a working programme which foresees the possibility of integrating, within GNP estimates, the results of fiscal controls and of measuring the difference between the amount of income which can be referred to as theoretical VAT and the one which can be referred to as VAT receipts.

Medium and long-term researches and studies are aimed at the creation of an integrated system of enterprise statistics which, starting from questionnaires submitted to enterprises by the various SISTAN (National Statistical System) bodies, may supply information regarding their structure and accounting situation. This could in turn lead to the creation of a system that permits a GDP estimate on both the supply and distribution sides as well as some aggregates, in particular inventories and investments, also with regard to their use.

An analysis of asset and liability statements of enterprises would furthermore represent a basis for the creation of real accounts of institutional sectors, and for an improved estimate of flows recorded in financial accounts of enterprises. By analysing the figures of income receivers, the functional and personal income distribution could be linked together, thus showing the links between economic, social and demographic data.

3. The comparison between data from fiscal sources and national accounting aggregates needs to be carried out carefully in order to identify differences and similarities. Therefore this data cannot always be used immediately, as it often requires appropriate adjustments.

It is therefore necessary to apply a methodology capable of ensuring an appropriate use of information supplied by parts of the information units (households, enterprises, institutions) by means of tax return forms.

Fiscal data from units producing goods and services supply elements that can be used to assess production; data from subjects that take part in production permit an assessment of the amount of income. In this way, it is possible to reconstruct the product, on the basis of the enterprise product or by using the data on the income received by subjects that have taken part in the production process.

The use of fiscal data thus becomes an original method for calculating both the functional and the personal income distribution. In addition, an assessment of the domestic product based on annually updated archives becomes possible.

Some differences exist between the field of observation of the fiscal source and the one which is of interest for national accounting purposes.

However, these differences can be adjusted with corrections which can relate the operations to which fiscal data refer to the country's economic territory.

Regarding the degree of coverage of fiscal data, it is necessary to note that the data available to the tax register concerns the units which take part in the production process in the regular economy of the country.

However, even this presence does not rule out some limits due to tax erosion, elusion and evasion.

In particular, excluding tax-free incomes and incomes subject to cadastre determination, certain units are not calculated: units with a taxable income lower than the minimum taxable income and units whose incomes are only subject to tax deduction at source, such as interest paid by firms and banks and by post offices to depositors and account holders, interest, premiums and other remunerations paid to bond holders, interest on state bonds and postal savings certificates issued after 1986.

On the other hand, it should be noted that the concept of taxable income for the tax authorities is broader than the one for national accounting purposes, as it also contains capital gains of enterprises and, sometimes, of households. Likewise, important differences exist, for enterprises, with respect to depreciation allowances. While for fiscal purposes they represent the allocation of the historical purchase cost of fixed capitals, for national accounting purposes they represent the consumption of fixed capitals assessed on the basis of their replacement cost.

The data gathered by the tax register on production units refer to income flows, from their formation to their distribution. They also concern subjects which only occasionally carry out a productive activity. These subjects are therefore also obliged to document their economic operations, albeit by means of simplified accounting.

Incomes are declared on forms which are diversified according to the juridical status of the subjects: the form 740 for natural persons, the form 750 for partnership companies, the form 760 for juridical persons. Natural persons who only receive income from employment may use a simplified form (form 101).

The enterprises which produce and distribute income, in addition to the declaration relative to produced income, must submit to the financial authority, as tax substitutes, a declaration of distributed incomes (for m 770) and, with respect to the beneficiaries of the same incomes, with forms 101 and 102. A similar certification (form 201) must be issued by subjects that supply pension benefits.

Without analysing in detail the contents of tax returns, a few comments are necessary as far as income from employment is concerned. In fiscal forms, these incomes are recorded within production costs in the self-employed and enterprise accounts (with data entered in sections E, F and G of the form 740, in the forms 750 and 760), as a certification by the tax substitutes to the fiscal authority (in the form 770), as a certification of the employer to his employee in the forms 101 and 102 and as income received by the worker in sections C and D of form 740.

Incomes from employment recorded in the form 770 reflect the universe of employed workes, with the sole exception of civil servants, the some thing domestic workes and similar, whose employers are not obliged to carry out tax withholding. They indicate the wages before tax and after social benefits to be paid by the worker and also include wage subsidy indemnities. In order to establish the gross compensation for national accounting purposes, it is necessary to deduct wage subsidies and add social benefits.

On the basis of an analysis carried out for this aggregate by means of a reclassification operation <sup>(1)</sup>, it was found that the ratio between fiscal incomes and compensation of regular workers, as they result in national accounting data, varies from 93,4% to 91,8%, for the years 1980-1983.

Among the analyses performed in order to implement the agreement for the connection between the information systems of the Ministry of Finance and ISTAT, it is necessary to mention the operation carried out by ISTAT in order to adapt the fiscal flows to SNA standards and contents and therefore to insert them into a national accounting framework <sup>(2)</sup>.

4. A precise exemplification of the importance that the use of fiscal data could have in Italy for national accounting purposes is represented by the survey which is annually carried out by Istat for the calculation of the product of industry, trade, transport and some types of services. Such survey is aimed at ascertaining the revenue and cost items of enterprises in order to calculate the gross product and other aggregates.

The survey takes into account around 50 thousand enterprises: around 25% of these enterprises do not answer adequately, this obliging ISTAT to carry out an integration of data which consists in attributing to workers identified for each enterprise the per capita values surveyed in an enterprise of the same size which operates within the same sector of economic activity and within the same region.

For smaller enterprises the survey is carried out by means of a sampling technique; the sample enterprises with 10 to 19 workers are contacted directly by Istat by means of questionnaires sent by post; sample enterprises with less than 10 workers are surveyed by direct interview carried out at the enterprise headquarters.

The last survey required interviews with 8,500 enterprises of the industrial sector and 19,500 of the tertiary sector.

The most recent survey regarding enterprises with 10 to 19 workers refers to 21,955 enterprises, equal to 65.9% of the sample of enterprises interviewed and to 14.1% of the enterprises of the 9-23 worker range, resulting from the 1981 Census.

In order to estimate national aggregates, ISTAT uses direct sources, such as the Banca d'Italia for credit institutions, the CISPEL for data on municipalized enterprises, the ANIA for balances companies, etc.; for realizing aggregates it mainly uses the survey on the gross product of enterprises, annually for those with more than 20 workers and every few years for the smaller ones.

The contribution of fiscal data for a more accurate estimate of national accounts could especially concern these latter surveys.

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(1) Cf. Bottarelli and Cristofaro in «Redditi da lavoro dipendente: un confronto tra la contabilità nazionale e l'anagrafe tributaria», in: Problemi di finanza pubblica, Vol. VIII, Roma Iacelli, 1988.

(2) ISTAT, «Confronto tra le basi imponibili fiscali ed i redditi dei conti nazionali, November 1992, internal report; A. Caricchia, «Proposte metodologiche per l'integrazione delle statistiche fiscali nelle stime di contabilità nazionale, Internal methodology note, ISTAT, June 1993.

The data surveyed by means of ISTAT forms concerns the main items necessary for the calculation of the gross product; all the items which are necessary to determine the operating income and loss are instead missing. Thus the contingent assets and liabilities, revaluations and devaluations (items which are present in tax return statements) are not surveyed.

On the contrary, in fiscal forms, which are aimed at establishing the taxable income, not all the items which are necessary for the complete calculation of the gross product are present.

A great contribution can also come from the fiscal source with respect to the coverage of surveyed enterprises; ISTAT surveys annually around 34 thousand enterprises within the over-20 workers range, equal to 73% of the total number of enterprises within this range, every few years 22 thousand enterprises of the 10-19 workers range (equal to 14% of the amount calculated in the 1981 Census) and 28 thousand very small enterprises counting less than 10 workers.

The information made available every year by the tax register is far greater; data concerning all balance items of enterprises using ordinary accounting (around 690 thousand individual firms, 465 thousand partnership companies and 445 thousand joint-stock companies) and the information contained in the forms filled in by taxpayers using simplified accounting (1,950 thousand individual enterprises, 235 thousand partnership companies and 15 thousand joint-stock companies).

In the two types of forms the same items of profit and loss accounts are present, even though in ISTAT's one a greater degree of detail is used.





# INFORMATION TECHNOLOGY FOR THE ITALIAN STATISTICAL SYSTEM

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## 1. Introduction

Over the last ten years in Italy, both public and private operators have gradually made greater use of statistical information. Important changes in the cognitive requirements of society as a whole have raised statistical demand, mainly in the operative sphere, where statistics play a part in the decision-making process, but also in the field of research, predominantly social research, and in daily household use. It may well be asked in what way information technology will help to meet requests made by the public and private market.

The role of information technology in the development of statistical output in terms of efficiency has always been universally recognised. Italian statistics, in step with international developments, pursued the computerization process, especially from the 1960s onwards: at Istat, data from surveys was soon processed automatically, and by the 1970s, the experience of hierarchical data bases for the dissemination of statistical data was already under way.

Although the advantages accruing from the use of information technology were immediately apparent, experience gained over the years led to new considerations: the efficiency produced by information instruments is guaranteed but, with regard to the effectiveness of statistical output, what sort of contribution is made by information technology? The information market has "naturally" gone towards general software applications, which for the market represents a broader range of interest compared with information technology for purely statistical uses. In Italy until a few years ago, the centralization of statistical structures limited official output more or less to Istat production. Internationally, similar general conditions of supply and demand of statistical information have meant that the computer industry has concentrated its action not so much on production software as on statistical data analysis, likely to be wanted and needed by both end users and producers.

It was therefore perceived that information technology was somehow being under-utilized, and that the use of all-purpose software applications

did improve efficiency but did not influence the effectiveness in terms of quality of statistical output as much as it perhaps should have. It was also clear that the statistical environment had specific characteristics that set it apart from other operative spheres, and that these special features had to be focused and treated via computer technology through the close collaboration between statisticians and information engineers.

The most likely solution to emerge in the 1980s, in response to new statistical requirements, was the adoption of information systems. More recent events, such as legislative measures in the public sector (as we shall see later on), have confirmed these general strategies that had been generated autonomously, and also represent binding support and encouragement for the future development of the national information sector.

## 2. The New Legislative Framework

The decision to revamp the country's statistical set-up through the creation of the National Statistical System (Sistan) was undoubtedly hastened by the profound changes in society's cognitive requirements. The Sistan aims to recognise and regulate the contribution that the public sector, even through administrative activity, can make towards official statistical output, increasing the quantity and quality of the offer.

As far as quantity is concerned, the rise in available information is naturally due to the broad make-up of the System: although the existence of thousands of different structures represents an organizational headache, it also guarantees almost total coverage of national information requirements.

The System is strata-based; at a central level there are: Istat, in its dual role of most important producer of official statistics and institute responsible for coordination, methodological orientation and control of produced information; central state administrations and public bodies performing activities inherent to national statistical information. The System then branches out to peripheral structures throughout the country, involving administrative levels of the state.

Public and official statistical data in Italy is no longer produced in a centralized way. Istat has the task of preparing annually the three-year Sistan national statistical programme, containing the surveys, researches and study projects to be carried out by all organizations within the system (ratified through publication in the Official Gazette, in which state laws first appear).

The global offer of the system is thus amplified by statistical information contributions deriving from the administrative activity of some bodies. The result is therefore a complex system in which local information takes on all but secondary importance.

In the past, statistical output may have suffered from the difficulties entailed in maintaining exchange, integration and co-ordination relations between Istat and other public administrations, especially those (the

majority) whose priority institutional aim was not statistical. Now it may fall back on regulations that are in this sense innovative and promising.

In addition to the Sistan, the legislative set-up in Italy offers another important opportunity with the creation of the Authority for information technology in the Public Administration. The Authority's objectives are of a more general nature, and provisions deal not with statistical output but with the overall institutional production of state administrations and national public bodies. But a common strategy links the setting up of the two bodies and the new regulations governing public sector employment: the search to enhance efficiency and quality in the public sector through the adoption of effective, transparent and standardized solutions.

As regards statistical output, the qualitative aspect of the National Statistical System needs to be dealt with so that society may gain the benefits accruing from the rise in available statistical information.

The overall quality of the system encompasses a range of aspects, such as the quality of the organization of the structure in terms of technological and human resources, and the quality of production processes.

The role of Istat as co-ordinator, policy-maker and controller, is the most prestigious yet at the same time the most arduous task. The complexity of the task may be overcome by introducing methodological and technical standards. The past role of Istat as statistical producer and actor in the European and international information sector has given it a level of experience that, as we shall see, entitles it to propose general solutions that may become standards in the System. In order to be governed well, the system needs to develop the idea of integration to cope with the complexity of the organization and of information resources. The concept of integration within the context of the system has a broad content, ranging from communication among its members to global monitoring of the system and, we stress, to the integration of statistical information (Colledge M. 1990) (Masselli M., Venturi M. 1990).

With their natural tendency towards rationalization, information systems may really be the ideal instrument for introducing standards and for achieving real integration as mentioned above. The aforesaid norms do in fact contain both direct and indirect references as to their use.

In particular, the provisions of the information technology Authority oblige the Public Administration to comply with institutional aims through the development of computerized information systems.

In the legislation that set up the Sistan, the role of information systems was less explicit, since the contents of the decree were more concerned with organizational aspects, essential for such a complex system to work properly. Behind the organizational structure however, the presence of the national statistical information system is clear, deriving from the participation of local statistical and operative systems. On this matter advanced experiences have already been carried out in some information areas of Sistan. We refer, for example, to the labour observatory, an information system created by the National Social Security Institute, or to company registers handled at a provincial level by the Chambers of Commerce for a dynamic analysis of businesses, or to the fiscal archives

on physical and legal persons kept by the Finance Ministry. In order to achieve homogeneous levels of quality and efficiency however, it is necessary to impose standards throughout the system for the drawing up and development of information systems, and also to work in order to integrate and make available to the public those systems already in existence.

### **3. Statistical Information Systems**

Various definitions have been given of an information system, and all agree more or less on the aspects of organization, resources and company aims. In the statistical field, definitions are not so clear-cut. Considering the two major factors affecting the development of a statistical information system – that is data and functions – there are those that prefer to associate the adjective "statistical" with data, defining as "statistical" an information system dealing with statistical data; others give priority to the role of the functions. In our experience and in view of the new existing conditions in the national statistical environment, we tend towards a definition based on the purpose of the system: an information system is "statistical" if it is used for statistical purposes or is devoted to the statistical handling of information, so that it is possible to include all traditional statistical activity, performed by means surveys, as well as activity carried out on existing gathered data of both statistical and administrative nature (Balestrino R., Bellini P., Masselli M., 1993).

In order to analyse the particular features of a statistical information system and draw up a plan of action aimed more directly at these characteristics, statistical production processes have been analysed according to the aforesaid co-ordinates of data and functions (FAO 1986). In terms of functions, the phases characterizing a standard process do not vary greatly and may be summarized by a series of ordered (and not all necessary) macrofunctions:

- statistical information or survey planning
- drawing up of the survey questionnaire
- sampling
- data gathering
- control and correction
- codification
- processing
- dissemination
- integration and analysis

Almost all operations accomplished to complete the statistical production process may therefore be referred to a limited number of homogeneous categories of activity for EDP purposes. As it has proved difficult to obtain specific computer products on the outside market that are suitable for specific requirements, the possibility of designing and

developing in-house problem-oriented software has been considered. The creation of appropriate generalized procedures corresponding to the mentioned activity categories could resolve the problems attached to the global control of the system and help to achieve some important objectives:

- an unambiguous, detailed definition of the methodological and technical framework to be taken as a reference for the carrying out of the statistical activity;
- control of the quality and uniformity of overall statistical production;
- surmounting of the unproductive separation between the professional roles of the statistician and the computer expert both in the analysis phase, when the statistician responsible for methodologies and the computer expert come together to design general software, and in the implementation phase, when the statistician in charge of the survey also handles the computer-aided part of the procedure;
- medium/long-term reduction in costs and time for the development of codes by the EDP Department;
- greater motivation for staff, involved in less rigid and less repetitive activities.

As far as the data co-ordinate is concerned, statistical information systems have different specific features too. If we consider the activity of an organization whose institutional aim is to produce statistical information, it may be realized that in its information system data is not only precious for company decision-making purposes, as it is the case for all information systems, but is also the central resource around which the Agency's activities are structured. Data must be produced, analysed and disseminated, and is subject to many transformations from the beginning to the end of the process. One important difference between traditional and statistical systems is that in the latter, special data classes are produced:

- microdata: (disaggregated or elementary data), gathered by observing variables of units being analysed;
- macrodata: (aggregated data or statistical data), obtained from microdata through statistical processing functions;
- metadata: that aims to describe data (Sundgren B., 1991).

It emerges from this that the semantic content of statistical data is undoubtedly greater than company data. In this respect, the contribution made by the computer industry is still rather disappointing: data processing products on offer on the market are of a general nature and do not take the semantic contents of statistical data into account. Currently, the above-mentioned requirements are partially fulfilled by database technology. Through a database, information is modelled: data is given

not only an excellent physical organization but also a logical design defining its structure and relations between data. Nevertheless, it is not easy for logical models used in database management systems currently on the market to encapsulate the semantic content of statistical data.

What has been said thus far has led statistical producers, and above all National Statistical Institutes, to modify the scope of their activity in order to concentrate on relevant issues and take on a guiding and policy-making (if not directly executive) role, drawing up methodologies and instruments aimed at raising the effectiveness of statistical production with regard to information systems.

On this subject, many important results have been achieved in the international statistical sphere and allowed to circulate freely in the official statistics environment, encouraging on the one hand the verification of products and their enhancement, and on the other the consolidation of a common statistical language and an exchange of experiences among national statistical institutes. Among those experiments conceived overseas and tried out or adopted by Istat, we wish to recall: the BLAISE system, developed by the Dutch Institute for the automatic management of questionnaires, the American tabulator TPL, products for the control and correction of data from Hungary (AERO), the US (CONCOR) and Spain (DIA).

#### **4. Italian Contribution to the Progress of Statistical Information Systems**

From the 1980s onwards, Istat has also been involved in defining and developing problem-oriented software applications that aim to encompass the utmost methodological content needed to produce statistical information correctly and effectively.

In the architectural framework of activity and data classes identified for a statistical information system, so far some specific themes have been selected. Generally speaking, the development of generalized statistical software has been characterized by the following features:

- collaboration between in-house professionals operating in information technology and statistical areas;
- cooperation with the international statistical community for exchanging experiences and obtaining consolidated results;
- cooperation with academic world for the definition of methodological aspects;
- opening up to outside computer technology market for the phases of development or engineering of products based on prototypes.

We believe that this chain of synergies has been productive for the overall growth of the statistical environment and should be encouraged in the future so as to be able to complete the methodological and operative framework for statistical output.

Referring to the activity classes, or macro-functions, identified in a statistical information system, our activity centres on the phases of planning and control and correction. With reference to data classes, good results have been obtained regarding the conceptual representation of macrodata and the general question of metadata.

New requirements and fresh possibilities have arisen with the creation of the Sistan. We refer in particular to the need to create a function to integrate information and to define ways of acquiring statistical information from administrative data.

#### *4.1. The conceptual representation of macrodata – Conceptual Statistical Model (CSM)*

The representation of data through conceptual models makes it possible to describe information at an abstract level set apart from the technological milieu in which data is handled. Conceptual models normally use graphic representations and produce easy-to-read conceptual schemas that may be used as background data, for planning purposes and as a common language among statisticians and computer experts (Sundgern B., 1984).

In order to represent microdata, Istat has adopted the E/R model (Entity/Relationship) widely used in business and statistical circles since the end of the 1970s (Chen P.P.S., 1976).

For the representation of macrodata in 1987, Istat, set up the CSM model in collaboration with the Information Technology Department of the Engineering Faculty at Rome University. With this model, it is possible to represent the semantic content of statistical data. An attempt is made to take account of the processes which transform microdata during statistical activity (Batini C., Fortunato E., 1986), (ISTAT, 1989). CSM profiles are represented graphically by series of nodes, with which descriptive labels can be associated, and by arcs. By means of various node-types, it is possible to represent the most characteristic objects in the statistical study:

- node "S": object classes
- node "C": classification variables
- node "X": classifications
- node "E": statistical processing
- node "G": generalizations (or sub-series relations among data classes)

#### *4.2. Macrodata design: MIDAS – Methodology for the integrated design of statistical data*

The methodology was defined in 1988 after results relating to the CSM model were obtained. It is split up into three parts:

- analysis of requirements;
- planning of disaggregated data;
- design of aggregated data.

The methodology guarantees the integration of single phases, especially between the second and third phases. Whenever data is aggregated, its consistency with disaggregated data is verified and all possible anomalies of form and content are eliminated. Output from this methodology may be used for subsequent logical and physical planning phases should one wish to create a database (Batini C., Fortunato E., 1986), (ISTAT, 1989).

The carrying out of the methodology was entrusted to an outside company, GESI, which developed the product Mast—er, of the CASE class, in the personal computing field.

#### *4.3. Metadata processing: DSSD – Dictionary System for Statistical Data*

Once the importance of metainformation in the understanding of statistical data had been recognised from about 1986 onwards, Istat started planning for the creation of a system containing the necessary information to describe the meaning and features of the gathered, processed and disseminated data (Balestrino R., Montagna S., 1991). The system is accessed through an automatic tool available on-line in a mainframe environment, enabling the user to move through the entities until he arrives at the desired information. The units considered in the system are:

- research
- survey unit
- analysis unit
- elementary datum
- aggregate datum
- classification
- publication

#### *4.4. Control and correction of data: DAISY – Design, Analysis and Imputation System*

In the production process a very important role is played by data control and correction activity as far as the quality of information produced is concerned. (Barcaroli G., Di Pace L., 1992).

The DAISY system, whose first version was released in 1992, enables the statistician to define the rules that are needed to single out and eliminate both systematic and random errors.

As far as random errors are concerned, the system is based on the Fellegi-Holt methodology, which defines only the possible error conditions (or "edits"); a procedure is left with the task of choosing the variables to be modified and the new values to be attributed. The procedure works by minimising the overall impact on the distribution of variables in the population.



The system is contained in a CASE-type application on mainframe, with a modular design. At the present time, only qualitative variables are handled, but further modules having new functions are due to be released.

#### *4.5. Future developments*

Further in-depth study of statistical production phases is being directed at the questions of survey questionnaire design and information integration.

With regard to the first area, an internal research team is working on the possibility of producing survey questionnaires from conceptual schemas of disaggregated data through an algorithm that converts representation structures from the E/R model into basic structures on the questionnaire (questions, sections, blocks, question sequence).

The question of information integration will be dealt with in depth by an Istat-SIS (Società Italiana di Statistica) joint group, working on the question of statistical information systems, their definition, planning and valuation within the new framework created with the setting up of Sistan.

The existence of Sistan could lead to new reflections and produce fresh problems as to the information and functional architecture of statistical information systems. For example, the drawing of statistical data from administrative data banks will certainly be closely looked at from both a methodological and operative viewpoint, in relation to the enlarged statistical environment brought about by the decentralization of the statistical function in Sistan.

The DSSD system, conceived to gather and handle metainformation in the Istat milieu, will need to be reconsidered to take into account the statistical activity carried out in peripheral structures.

The general aim will be to optimize the previously outlined general framework by guaranteeing the integration of applications employed. Hardware processing capacities will be analysed to choose the most suitable environment to host the planned software. Experiments in UNIX systems are currently being undertaken, which may lead to the introduction of the mini-computer class in the Istat processing sphere, in addition to the current mainframe and personal computer classes.

### **5. The Integration Function**

We have already spoken about the importance increasingly attached to the integration function by national statistical bodies. When statistical information is used in the analysis and interpretation phase, what gives added value to available data is the relational nature of that information, that is the capacity to compare information that may belong to different areas.

The demand for "relationshipness" with regard to statistical information has naturally spread to information systems, and in Sistan this demand is constantly rising. On the one hand, all Sistan organizations that undertake processing and studies based on statistical data produced by

others express this sort of request. On the other, even within the same body, when separate systems or sub-systems are managed, the same request may emerge. We may think for example of the Istat national accounting department, which uses data produced in varying statistical areas.

Rather than using the general term of "relationshipness" we prefer to use the more precise term "integration", in which the concept of optimization is probably implicit: information integration is the optimized relationship among information sources.

Information system integration poses two sorts of questions, one of a semantic nature – how correctly may data from different sources be compared? – and the other is a physical constraint – How can one gain physical access to data in separate information systems?

To make information systems more capable of carrying on semantic dialogue, it is first of all necessary to control methodology and production factors, data classification choices and the availability of sufficient metadata to be able to understand data correctly.

At least as far as statistical data produced from surveys is concerned, all Sistan administrations must gradually conform to standard methodological instructions, valid for all the various phases of the statistical output process. Classifications, for their part, may constitute a link formed by statistics between information systems to compare a posteriori statistical data produced separately.

Source integration may in fact take place before the onset of procedures: that is, it may be applied not to statistical data but to the elementary data of analysis units. In that case, the statistical units need to be identified, in the various processes, by the same key variable. The possibility of integrating operative systems in terms of elementary information has undoubtedly been helped by legislation adopted at a national level on identifying variables common to the whole public administration, such as a fiscal code for individuals (physical and legal persons).

An example of the application of information integration is the project recently commenced within Sistan to construct an integrated social accounting system, starting off from the elementary data available from various administrations: the Finance Ministry, the National Institute of Social Security (INPS), the National Institute for Assistance with Injuries in the Workplace, the Ministry of the Interior, the Labour Ministry, Istat. In the early stages of the analysis, the usefulness of the common identifying variable, the fiscal code, for the various sources stood out, as well as the potential effectiveness of a system based on an almost exhaustive wealth of information. However, other critical factors have emerged, and must be kept in check, since they may impede integration, giving rise to user constraints: the possibility of homonyms among the variables handled in various fields, different fields of observation, the use of not easily integrable space-time variables and classifications. The experience gained on the project may profitably be used for defining the methodology and management of the integration function.

Leaving aside the problem of whether it is possible or useful to

compare statistical information semantically, there are times when it is in any case useful and necessary for administrations to gain access to data in an information system that may be located anywhere. The solutions to the problem of the physical availability of data are on many levels, from the simplest to the most sophisticated solutions: the supply of paper documentation containing the data; the supply of magnetic tape; direct long-distance access via computer-aided connections to the information system. In the latter case, access to remote data is possible with an interconnection. On the subject of interconnection, two experiences under way at Istat should be recalled, with the National Institute of Social Security and the Ministry of Finance, both part of the national statistical system. Interconnections guarantee, in this experimental phase, bidirectional access to the respective on-line information systems in the form of databases. So far, this has permitted ad hoc functions to be carried out within the applications, but it excludes free processing capacities of one mainframe on the other ones. The first archives involved in the operation are of a statistic nature: for Istat, the database system for public disseminations; for INPS, the labour market database; for the Ministry of Finance, the statistical part of the fiscal archives of physical and legal persons.

The more general aim is to favour the speedy computer-aided exchange of data even outside the purely applicative environment, and in working environments to facilitate activities for the control and comparison of respective data. The interconnection technique, originating from a purely physical-systemistic background from a functional viewpoint, may become a potential instrument for achieving the more ambitious objective of integrating information and processes in the Sistan procedures.

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# HOUSEHOLD SURVEYS: THE EXPERIENCE OF THE MULTIPURPOSE SURVEY IN ITALY

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## 1. Introduction

The last ten years have been characterized by great changes which have affected both the demographic and the economic fields. Relevant strata of society have been involved in this process, so that a number of individual or family behaviours have been strongly modified.

The recent needs of information, caused by the above-mentioned phenomena, urged the National Statistical Institute to start a new, socially-oriented survey methodology, in order to get further informations on new life-styles and individual or household behaviours.

During these years both the amount and the quality of statistical information provided by ISTAT on social items have been remarkably increasing. As a matter of fact, all over this period ISTAT has carried out a number of surveys on several issues, such as: health status, readings, holidays, sports, household.

Since 1987, by the use of household multipurpose survey (HMS) we have been able to provide a unitary methodology in order to gather all the above mentioned information so that we could change a very fragmentary information scheme into a comprehensive one; at the same time an occasional and episodic need of information has been transformed into a regular and permanent information system.

Several new issues (life styles, social and parental relationships, home and social environment, use of time, conditions of disabled people, home accidents) were included in HMS for the first time among the others, (health status, education and school attendance, holidays, sport, reading and so on.)

In our experience, these newly collected information have been combined with the traditional issues that ISTAT has already been considering. Household has been regarded as a collection unit on which we could base the research.

During 1993 the survey has been methodologically revised and the set of informations collected has been integrated with some new items such as use of public services, nutrition, political participation, health

expenditure and so on. A core of informations will be collected each year regularly, so that we'll have a continuous social survey. (See Appendix 1).

## 2. Why a Social Survey?

A number of reasons justify the starting of a permanent survey on social items.

First of all, it is commonly admitted that not only the availability of economic resources but also the social environment, the individual and social relationships, the health status, the quality of public services and leisure time, the individual life style and, last but not least, individual opinions and perceptions are able to determine one's own welfare status.

"In addition to the need to dispose of a set of so-called *objective* indicators relating to real and actual events, which can be surveyed by the use of verifiable and reliable methods and techniques, another necessity is urging; in fact we need to specify and survey a new set of *subjective* indicators which must be related to individual behaviours as well as to perceptions and attitudes. Since we use the so-called social indicators in order to collect informations on various relevant items relating to welfare, they cannot be restricted to merely objective surveys on social conditions since individual perceptions and attitudes are directly indicative of the way in which our social condition is able to determine our own welfare status, a survey on perceptions and attitudes out to be carried out together with a more 'objective one' (Golini, 1981)

Thus, since a mere 'economist' point of view is no more able to qualify the complex of life conditions, the need of more suitable informations which could be able to show properly life qualities and social inequalities is now urging.

Secondly since a relevant gap exists between what is perceptible and what is hidden within the public statistical information system and since such gap is becoming larger and larger due to present social dynamics as well as to the increasing complexity of social events, our need to dispose of a suitable information device becomes more and more evident.

Several examples can be provided : as for the field of judicial statistics, the ratio between denounced and not denounced criminal events is approximating to 1; the same can be said as for the home accidents: 52% of them remain unknown as they are not treated in hospitals or first aid centers. The situation is almost the same as for school duty evasions or couples living without being married and so on.

All these events cannot be registered by the yearly administrative surveys, so that they can be regarded as '*invisible*' from a statistical point of view.

Furthermore, and in a more relevant way, we have to deal with some social subjects which have been '*invisible*' for a long time .(Sgritta, Saporiti 1990)

In the past a very little number of subject oriented statistics have been performed about women, childhood, elderly people and disabled people conditions or, at the best, they have been a "subproduct" derived from major surveys.

Presently the above mentioned subjects are invested by social politics and are regarded as crucial elements of interest and care both from a social and a demographic point of view; thus, the need of collecting information in order to direct, verify and control the related social services (the public as well as the private one) is increasing.

As long as we don't gain a global knowledge of the conditions under which social needs are satisfied or, on the contrary, remain unsatisfied, we won't be able to plan any suitable intervention in order to fulfill such needs.

With the use of surveys on population at regular intervals we can collect useful informations about the nature of those partially unexpressed needs.

The new HMS configuration allows us to approach up-to-date informations items, in particular the ones relating to people opinions and attitudes about public services.

Since the relationship between population and public administration is now changing its nature, an approach like this is expected to allow services users to express their own opinions.

On the occasion of the last pilot survey carried out from 5 to 15 July 1993, people have shown their satisfaction for this new approach; this fact must be taken under consideration if we want to establish an information system which could be easily managed by the whole population although remaining within its institutional range and its neutrality.

Although it cannot be considered as completely exhaustive, the amount of information we'll be able to collect will be a basic and regular evaluation source in order to check the performance of several public primary services such as: health services, postal and telegraph services, population registry offices as well as public transportation system.

In this way we'll be able to provide effective statistical information which can be regarded as '*user friendly*' owing both to its contents (everyday life) and to its purposes (knowledge and improvement of life conditions and welfare)

"Information has always been considered as a *common good* since it is closely connected with a correct assertion of individual civil rights. Since social phenomena and events are progressively playing an extremely crucial role. ....In other word information is to be considered a source of power, from which actual benefits can be obtained, provided that one could approach its sources or be able to take advantage from it. But overall information *is* a common good, since in any democratic system absolutely no reason can be adducted in order to exclude anyone from its enjoyment" (Sgritta, 1988)

### 3. Methodology

From the conceptual point of view, the multipurpose survey started in 1987 has been successful in improving the whole amount of statistical progress in research. Actually some information, e.g. those about home accidents, have a great relevance. Furthermore the questions about

disabled people allowed us to collect information not only their quantitative consistence and their social status but also on the family patterns they have to deal with or the public services provided at the purpose. The same can be told for children and elderly people, regarded as social actors, at the moment we are able to know how they live, what they usually do as well as their domestic environment.

Indeed this new kind of survey has requested a particularly complex organization, together with the use of a more complicated methodology.

Our past experience (1987-1991) showed the necessity of more adequate methods, since we had to establish a new design which could be suitable for the complexity of those new issues.

On these basis we combined several survey techniques in order to collect specific information, which were characterized by an extreme differentiation and showed a certain variability according to the seasons of the year.

According to the new project, information are collected by the use of an integrated system, formed by a set of social, demographic and health surveys on household; such system is quite entirely based on a single design; in fact we use specific designs only when we want to collect information on occasional phenomena, which need to be surveyed with the use of specific techniques (e.g. budget time survey).

Our single design includes the following steps:

1. A new cross sectional yearly survey at a fixed -time in order to administer a questionnaire about structural or non-seasonally affected variables or, finally on those quantitative information which can be collected retrospectively over the last twelve months.
2. A cross sectional yearly survey based on quarterly repeated independent samples. With the use of this kind of survey we are able to collect seasonally affected variables from retrospective sets of questions (one or three months).

The employ of this cross sectional survey at a fixed time provided us the collection of structural variables concerning household and family members, as well as a set of socially relevant information. Every time this survey is combined with a questionnaire on one specific issue (e.g. : women, children or elderly people social status); the set of questions must be repeated cyclically after more than one year.

With the use of the quarterly survey, every year we are able to collect information on one or more seasonally affected phenomena, in particular on those concerning health status and health services demand. In addition to this, we use to administer questionnaires about specific items (holidays, reading, crime etc.). The subjects of such questionnaires change every year.

This survey design can be considered entirely new, since it is based on the two continuous yearly surveys on social issues reported above. The same items can form the main frame of the whole survey; in fact they are able to link different kinds of information on social conditions.

The two parallel surveys provide us a set of information that we are able to collect yearly; otherwise, they couldn't be obtained from any other



source. Furthermore, they can be considered particularly useful in order to establish suitable social politics based on individual, families and relevant events.

Several topics are involved on these surveys: education and school attendance, housework and jobs, spare time, means of transportation, social and parental relationships, home and social environment, health status and ways of life, crime and victimization relationships between public services and users (use and satisfaction rate).

This survey will result in quantitative information, so that our Statistical Institute will be able to provide useful data not only about public services supplies but also on the actual demand.

### **Résumé**

*Dans la communication on a présenté la méthodologie, la technique et les objectifs cognitifs de l'enquete "Multi-objêctif", une enquete socio-demographique très complexe conduite par l'ISTAT.*

## **Appendix 1**

### **Summary of main topics included in the HMS (Annual module)**

#### **Health**

- Long term illnesses
- State of health and medical care
- Use of health services
- Health expenditure
- Use of pharmaceutical product

#### **Education**

- Educational level
- School attendance

#### **Life –styles**

- Drinking
- Smoking
- Nutrition

#### **Leisure**

- Reading
- Mass-media consumption and information level
- Frequency of holidays
- Sports
- Theatre, cinemas

#### **Social relations and activities**

- Contact with family members and friends.
- Membership and activity in various association-
- Membership and activity in political parties

#### **Public services**

- Transports,
- Post and telegraph
- Transports
- Administrative services
- Bank

#### **Housing**

- Type of dwelling and tenure
- Space
- External environments
- Housing service
- Use of seasonal dwelling

**Security**

- Traffic, home and work accidents.
- Insurance protection
- Worry about certain conditions (health, economy,...)

**Crimes**

- Burglaries
- Theft from private households.

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## DISCUSSANT

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André Vanoli – *INSEE*

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Being myself a by-product of the Italian emigration society of the beginning of the Century, I am especially delighted to contribute introductory remarks on three papers.

A brief comment first in connection with Piero Erbàs paper "Revision of National Accounts and Issues on Harmonization of Statistics. The Italian Approach". After the revision of both the United Nations' System of National Accounts (SNA) and the European System of Integrated Economic Accounts (ESA), the intellectual status of the latter as compared to the SNA may not be the same as it was in the past for two reasons: the high level and quality of the 1993 SNA and also the risk for the ESA to look a bit backward due to the conservative views taken by the majority of Community countries.

A short comment also on Prof. Sergio Gambale paper "Use of Fiscal Data for Statistical Purposes: Problems and Future Developments". I am very glad to hear about the important agreement reached between the Ministry of Finance and the National Institute of Statistics in order to use fiscal data on enterprises in order to create a single standardized register of all enterprises and local units and make national accounting estimates. As far as the second purpose is concerned, it is not clear to me if ISTAT statisticians will have access to individual data themselves. From the French experience in this field, it appears that such access, which we obtained long ago, has been very important in order to make efficient use of fiscal data. It permitted statisticians to check the coverage of fiscal files individually in terms of enterprises above a certain size. Moreover and chiefly, it made possible to take into account the many changes that occurred in the legal structure of enterprises, like mergers and partitions. Taking due account of these changes is essential for interpreting correctly the basic data.

I now come to the paper by A. Beltratti and C. Costantino "Sustainable development and Official Statistics: the ISTAT-Fondazione ENI-Enrico Mattei project". The recommendations of the Commission of experts are cautious, as they do not envisage for the moment the calculation of an environmentally adjusted NDP and give priority first to physical flow accounts and environmental protection expenditures accounts, then to the

study of accounts on ecosystems. This position is wise because the issues involved are very complex actually. I like to comment briefly on some of these issues. The paper refers to the often advocated distinction between a cost-oriented approach and a welfare-oriented one. Instead of a cost-oriented approach I prefer to speak myself of an assets-oriented approach, an expression which fits more the Hicksean concept of income and prejudice less the conclusion.

The welfare-oriented approach is probably hopeless as it meets the well-known difficulties encountered in trying to measure welfare, mainly the fact that utility is neutral. In this context, the concept of defensive expenditures as meaning expenditures not to be reckoned in from a welfare point of view seems indefensible, even if it has been shared by Simon Kuznets himself who covered as expenditures with a cost-character many expenditures connected with participation in the technically and monetary complex civilization of industrial countries, like payments to banks, etc... Of course, one may like to do a purely conventional choice, and exclude for instance alcohol and tobacco from what is supposed to add to welfare. This is however an ethical approach, not an economical one.

In the assets-oriented approach, two cases must be carefully distinguished. In the first one, the value of the depleted natural resources, mostly sub-soil resources, is included in the market value of the extracted products. In such a case, I think that the relevant treatment consists in recording the value of the depleted assets as a negative change in inventories rather than as output. As a consequence, there is a case for reducing by the same amount not only Net Domestic Product, but also Gross Domestic Product and output. The issue of the degradation of natural assets due to their use in economic activity is more complex. As the value of this degradation is generally not included in the value of the corresponding products, the internalization of maintenance costs in order to balance the pressure on natural resources would imply a different price system. Volume aspects would have to be considered rather than simple adjustments in current value. When degradation actually occurs, by lack of maintenance costs, it seems relevant to record an additional (final) consumption of natural assets, counterbalanced by a capital transfer from Nature to the Economy.

Thus, taking into account environmental aspects in national accounting may have various implications, and not always the adjustment of Net Domestic Product downward as it is often advocated. It makes indispensable reflecting on the concept of value (what value means), beyond the problems of valuation.

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