ECLAC
Economic Commission for Latin America and the Caribbean

First meeting of the Statistical Conference of the Americas of the
Economic Commission for Latin America and the Caribbean

Santiago, Chile, 9-11 May 2001

CHALLENGES AND TRENDS IN THE MODERNIZATION OF NATIONAL STATISTICAL SYSTEMS

Modernization of structures and methodologies

01-2-190

I – INTRODUCTION

The purpose of this paper is to provide a brief description of the experience acquired in recent years by the Office of the Director of Statistics of the Secondary Sector of the National Institute of Statistics and Censuses (INDEC). This Office is responsible for issuing basic statistics —collected through its own surveys or compiled from other studies— on the industrial, construction and energy sector of the Argentine Republic.

Periodic visits by international experts from some of the leading statistical offices in the world, including Statistics Canada and the Institute of Statistics and Economic Studies (France) have contributed to on-going improvement in the Office's statistical coverage and quality of information. In addition, INDEC officials have received training at those institutes. Modernizing the structures and information methodologies throughout the 1990s was no small feat. Throughout the last decades, the Argentine economy and, especially the industrial sector, has been affected by a series of changes which have led to the emergence of a new model of performance, capital accumulation and linkages with the international economy.

Specifically, this trend would inevitably be reflected in the different statistical data-collection exercises and Argentine corporations were forced to implement significant changes in order to come to grips with new conditions at the local level (stability, increasing competition as a result of greater openness) and on the international scene (increased technological flows, the emergence of new competitors, redefinition of the role of multinational corporations, to name a few).

In view of the changes identified, survey samples had to be increased and new ones added, notably the evaluation of the Technological Behaviour of Industrial Companies. Furthermore, the increasing and more frequent demands for information had to be addressed and this was done through the monthly business reports. At the same time, an effort was made to coordinate the different exercises more closely to make it easier for companies to fill out questionnaires, and to comply with requests by economic agents for special studies.

Section II of this paper focuses in greater depth on the relationships with firms and users; section III presents some considerations on basic changes in prepared indicators; section IV refers to the greater utility of on-going programmes while section V of the paper deals with the relationship with the provinces in conducting the different work programmes.

II   RELATIONSHIPS WITH FIRMS AND USERS

II.1   Towards the concept of Total Quality

Much has been written on the concept of total quality and numerous seminars have been conducted to address the issue. For the Office of the Director of Statistics of the Secondary Sector of INDEC, and at the risk of simplifying the concept, total quality is defined as follows:

Gradual but constant improvement in the exercises based on the methods used by major statistical offices in the world.

Producing publications in a more timely manner
Responding promptly and in due form to the needs of economic agents.

What do we mean by these concepts?

Examples will be taken from the different work programmes of the Division.

In the case of the **Annual Industrial Survey**, there has been a substantial improvement in the sample in recent years as a result of the preparation by INDEC of the Input/output table. The usual sample of 3,000 premises was increased to 5,000, thus guaranteeing better results and wider disaggregation. The Annual Survey has become the core element of the table and thus the challenge, once this exercise had been completed, was to use the benefits gained in that year and project them over time, in spite of the lower budget in "normal years" in which a study of the scope referred to was done.

Unlike the monthly survey or the business indicator referred to as the Monthly Industrial Estimator (MIE), the Annual Industrial Survey has the merit of providing structural information such as value added, the value of output and intermediate consumption, as well as other vital indicators for monitoring trends in manufacturing. On the downside, this type of exercise gives results that are slightly out of phase in terms of time, bearing in mind that it is a national survey and compliance with the deadlines is beyond the capacity of INDEC since the work is carried out jointly with the provincial statistical offices.

The Annual Industrial Survey did not play a major role during the long periods of high inflation experienced in Argentina, since, by the time the results came out, they were no longer relevant. In the early 1990s, the Institute started to publish the results of the Survey and to provide them to the National Accounts Office for use in calculating manufacturing output (GDP).

However, we are convinced that the Annual Survey can be used more profitably. Plans for the current year (second quarter) include the publication of a list of industrial products that has arisen from the Survey and which complement (in a much fuller way) the *Estadística de Productos Industriales*, which is a quarterly review prepared by INDEC, and which contains series of selected industrial production goods. This information is based on different sources: surveys conducted by INDEC itself, data from other government agencies and information from business institutes.

In addition to the Annual Survey, INDEC has another programme: the **Monthly Industrial Survey (MIS)**, which is based on a sample of approximately 3,000 industrial units (the same sample as the annual survey before preparation of the Input/output table). This survey is representative of the national situation and covers production units of different sizes and of wider sectoral coverage than the **Monthly Industrial Estimator (MIE)**, the other business indicator referred to earlier.

In order to evaluate the variation in the Monthly Industrial Survey, reference should be made to economic events that occurred in the last few years. The manufacturing industry underwent a significant structural change which lasted throughout the decade of the 1990s. Increasing integration with other countries of the region through Mercosur and greater stability in the exchange rate and prices led companies to adopt production processes and incorporate relevant technological changes designed to enhance their competitiveness. This trend led to corporate mergers and splits, the transfer of establishments and changes in the level of vertical integration of production. Frequent reviews of results were carried out as well as new searches for alternative sources of information and consistency tests. In addition, consultations were held with international experts from Canada and France. The substantial improvement which took place in this exercise in the latter part of the 1990s was the change in the variables used for monitoring

production moving from a method based fundamentally on the survey of quantities of goods produced to the deflated value of output (obtained from information on sales and stocks in current prices). This methodology, used by several of the major statistical offices seeks a comprehensive solution to certain collection and processing problems that had existed earlier through direct calculation of output. The earlier method had caused skews, as described below:

(a) In the case of establishments that produced too many, or too wide a variety of, products, a quantitative methodology could not be used; (b) the emergence of new products, the need to assign appropriate prices for the base period, when such goods did not even exist; (c) the existence of "baskets" of products which included the diversity of specific goods, whose study could introduce distortions in the behaviour of indicators.

The results of the Monthly Industrial Survey are published in the regular publications as well as in the monthly review, INDEC INFORMA. They are obtained approximately 60 days after the end of the month in question. Efforts are being made to reduce the deadline to 45 days, although like the Annual Survey, speed is affected by the fact that this is a nation-wide exercise involving the participation of the Provincial Statistical Offices.

Continuous efforts have been made to monitor the business sector more effectively through the Monthly Industrial Estimator despite the short period involved. This indicator measures monthly variations in industrial production. The timely availability of information and the accuracy of results are indispensable for the preparation of the MIE.

The Monthly Industrial Estimator provides sectoral information for a substantial set of industrial activities. The list of respondents comprises 135 entities (leading firms, chambers of commerce and public agencies) which report on 115 products and inputs that are representative of the behaviour of the industrial sector. These respondents provide monthly figures on production and shipments, expressed in physical units. The items have been selected on the basis of research on intersectoral linkages. In this way, a series of products are identified which reflect the level of activity either directly, as a representative indicator of production or indirectly as the sector's main input. This information is used to work out the index number for each of the subsectors and the general level which measures the development of industrial production. The first MIE data relate to September 1993.

In those cases where it is relevant to consider apparent consumption, production data are supplemented with foreign trade statistics processed by INDEC for the counterpart tariff positions of the products under consideration. This methodology is used to estimate the evolution of sectors which are highly diversified and which have a high percentage of small and medium-sized businesses. To cite some examples of apparent consumption covered in the Monthly Industrial Estimator, mention should be made of the metallurgical industry, excluding the automobile industry, the plastics manufacturing production sector, fabric preparation, the manufacture of bread products and pastas.

Since the general level reflects certain seasonal changes throughout the year due to climatic conditions, institutions and so forth, seasonal adjustments are made using the method X11-ARIMA version 2000.

A qualitative industrial survey is carried out which collects information from a group of major companies in order to evaluate the situation and the short-term economic outlook.

The first issue of the Estimator appeared as a press release in May 1996. Initially, it was published on the last working day of the month t+1 in a slim volume which gave priority to the evolution of the aggregate industry index. It is now issued on the 22nd of the month t+1, but the approximately 25-page-long release may be divided into three chapters: a summary with the industrial result, comparisons, seasonal adjustment, cyclical trend and winners and losers in the industry; a monthly sectoral report on the activity of the different industrial branches and the qualitative survey referred to on the industrial outlook for the following month, the following quarter and/or the following year.

From the year 2000, in the middle of the month t+1, an advance of the result of the index for month t was prepared in another press release. The timeliness with which this information was released places INDEC among the leading statistical institutes.

II.2   Streamlining questionnaires. Accounting criteria

Entrepreneurs who reply to different questionnaires often complain, and rightly so, of the volume of requests received and the significant administrative work involved. For this reason the Statistical Offices has the duty to lighten this load as far as possible, to agree on the information required and, whenever feasible, to centralize the work of specific respondents and survey takers.

If we review questionnaires used in previous years in different exercises, it can be demonstrated that entrepreneurs were often asked to supply data which, in the end were never used.

The idea is to go on streamlining questionnaires each year, requesting only what is strictly necessary in order to reduce administrative costs for firms as well as for INDEC. To this end, firms were also asked to provide balance sheets in the Annual Survey exercise, which often proved useful for checking doubts regarding questionnaire data and cuts out the need for a further questioning and disturbance to firms.

But in addition, and the most important thing is to apply accounting criteria to the questionnaires to make it easier for firms to fill them out. Specifically, it is a matter of obtaining the bulk of the information required from the balance sheet.

II.3   Using the Internet to obtain information

Traditionally, statistical offices —and INDEC is no exception— conduct their surveys through survey takers and questionnaires that must completed by firms. In some exercises, the process is simple and the survey taker becomes a virtual messenger. In the case of industrial surveys, the mechanism takes on different characteristics. Since these are national exercises, coordination tasks must be carried out with the provincial statistical offices. This consists in agreeing on the field work, the preparation of the form, the initial consistencies that the survey taker has to check. These steps require the organization of training courses for survey takers and supervisors, in which the provincial coordinators of the exercise also participate. Consequently, the survey taker of the industrial surveys is a special survey taker, whose experience sometimes proves fundamental for guaranteeing the quality of data.

Another of the characteristics of industrial surveys is the different size of firms and/or units involved and their geographic location. Since it is a sample, every type of business is taken into account, including some whose electronic equipment is very rudimentary.

Thus, INDEC took its time to prepare the technological leap involved in switching to the use of diskettes, CDs for its questionnaires or ultimately to receiving the information directly through the Internet. Whereas there has been progress in computer software and this type of exercise is even usual in the Survey of Major Corporations, it is still in an initial stage in terms of major quantitative surveys.

In 2001, respondents started to send in Industrial Survey information through the Internet. In this regard, the following steps are being made:

(a)   Contact with firms. The results obtained proved highly encouraging. The vast majority of firms prefer to operate through e-mail. In any event, this will leave firms the choice of the method they prefer to use for their response.

(b)   The approach will be gradual, starting with the Federal Capital, Greater Buenos Aires, and some major cities within the country.

(c)   Mechanisms for ensuring confidentiality of information communicated through electronic means will be fully guaranteed, thus ensuring statistical confidentiality.

II.4   Providing "custom information" to users and respondent firms

II.4.1.- One of the objectives relating to "total quality" is user and respondent satisfaction. While it seems ridiculous to assume that firms asked to provide information periodically will be delighted to spend their time responding to statistical institutes, what is certain is that it is a duty for these institutes to facilitate the work and give them "something in exchange". Historically, they have sent them the publications on the very exercises in which they have participated. A simple survey carried out by companies has demonstrated that only a few are really interested in the publication, that it does not always reach the proper person and almost inevitably ends up in the waste paper basket with the resulting futility and, what is worse, lack of interest of respondents.

In the light of the experience of some statistical offices, in particular the National Statistical Office of Spain, some survey respondents were questioned. Based on the European experience and some of the responses received, it was decided that from the current year, firms would be given "custom information" clearly without this impairing statistical confidentiality.

Specifically, statistical data of interest to them would be provided together with output data (based on the results of the Annual Industry Survey) what is the firm's market share in the sector covered by the report, how many firms have a higher share than its own, how many are of the same size, how many have a higher level of productivity, etc.

In order to achieve this objective, it will be necessary to develop computer methods. How soon these are implemented will depend on the priorities set by INDEC in a year of high activity in which priority attention will be given to the Population Census and not industry surveys.

II.4.2.- Some years ago, statistical offices were reluctant to reveal unpublished information. In many cases, it was argued that the relevant data at their disposal was not of the necessary quality, did not constitute a proper sample, or had not been duly checked for statistical consistency.

Certainly, economic agents were working without the proper tools and had to make their own estimates or resort to private sources. In both cases, unequivocally, the information obtained was of lower quality than what could be provided through the official service.

The situation has improved in recent years. At the Office of the Director of Statistics of the Secondary Sector, at INDEC, there is the conviction that the worst number is the one left blank. As a result, the working mentality has been changing and now it is practically forbidden to fail to respond to requests by users, except, of course, when it is a matter of statistical confidentiality. The idea is to give out whatever information is at the Institute's disposal at the level of quality that has been achieved and to specify, where appropriate, that the information is subject to reservations.

Experience has been very positive and users are suitably grateful for the "poor-quality" information provided and, of course, make use of it.

As far as the future is concerned, it is felt that one of the main sources of income that the statistical institutes will have, apart from possible budget items will be through the preparation of special or "custom-made" studies.

In many countries, legislation will have to be changed to ensure that the funds collected can be used for modernization of national statistical offices and to pay staff salaries commensurate with their responsibilities.

III. Change in the base year for indicators prepared in the sector

III.1. Criteria for establishing the base year

The current base year for the Monthly Industrial Survey (MIS) in constant prices is 1993 and reference is made to the 1994 Economic Census. This decision was a very timely one in view of the far-reaching structural modifications that took place in the Argentine economy and in particular in the industrial sector from 1990.

The new Monthly Industrial Survey was conducted in 1996 and taking into account the former experience and international recommendations, different improvements were implemented, namely:

- Updating the base period from 1986 to 1993;
- The survey unit was changed from the establishment to the local unit, a criterion adopted in the 1994 Census;
- The sample used was widened; and
- A new methodology for calculating quantities of goods produced was introduced for determining the physical volume index based on deflated output values based on sales value less net inventories.

Changing the base year means choosing a new year the price structure of which will be used for weighting aggregate quantities to enable the addition of heterogeneous goods which are in keeping with different branches of the industrial sector.

It is also known that the production structure in market economies displays a strong dynamism over time, so that there is consensus in terms of the need to renew the base periodically; a time-frame of 10 years, or five in developing countries, which are subject to more

rapid changes (and which have larger budgets that make it possible), is normally considered appropriate. An economic situation that is in constant flux must be correctly addressed if one is to evaluate disequilibria, new products and new agents.

Thus, starting with implementation of the 1997 Input/output table, it was decided that 1997 would be adopted as the base year for the Monthly Industrial Survey with effect from 2001.

Generally speaking, we can state that with preparation of the Input/output table, greater accuracy is available for estimating the production of each sector since comparing supply with the use of goods and services produced in the economy, the Input/output table provides a solid framework for estimates that come from different sources, in this particular case for industrial surveys.

III.2.   Study and/or modification of deflators

The change applied in the methodology for computing the Monthly Industry Survey brings us to the study of the index that enables us to convert the physical volume index in nominal terms into a physical volume index in real terms.

The physical volume index of industrial production for any branch is estimated by adding quarterly deflated sales and the variation in deflated stocks.

Deflated sales are obtained by dividing total sales by the grouping index corresponding to the Producer Price Index (PPI) of the System of Wholesale Price Indices (1993=100). For purposes of this operation, the products listed in the PPI had to be regrouped so as to obtain the best possible match between the baskets of the two surveys for each branch.

Currently, this match is being reviewed in conjunction with the Office of Service and Price Statistics on the basis of the structure of the deflators and disaggregated per 5-digit branch (International Standard Industrial Classification of All Economic Activities —ISIC Rev.3, national classification) which is made up of the weighting of products included classified according to the provisional Central Product Classification (CPC-UN) plus a sixth digit added by the Pricing System and product description. From here on, it is compared with the 1998 Annual Industrial Survey file (with data for the year 1997) per 5-digit branch only for firms covered in the Monthly Industrial Survey (MIS), which shows the percentage share of invoicing of products that make up each branch within the total.

This analysis enables us to establish the validity of the current structure of deflators, to propose possible corrections and to incorporate new products that are more compatible with those included in the MIS.

In any event, the deflation at the branch level is not the only possible alternative for purposes of the correct calculation in real terms of the physical volume index. Other issues that emerge when designing an appropriate deflator must be borne in mind, including:

-    Since the declared sales data in the MIS relates to both the domestic market and goods exported by declaring firms and the PPI only shows domestic prices, the relevant adjustment should be introduced in the deflator. This approach proves difficult to apply in the short term owing to characteristics on information obtained by the Foreign Trade Office from customs data.

- Another issue to be taken into consideration is the level of disaggregation at which the deflation should be done:

(a)   Deflation by local unit: this means that the PPI register should list at least all the local units of the MIS in order to be able to carry out this type of deflation;

(b)   Mixed deflation: this would imply using deflators for each production unit included in the PPI register and deflators for each branch for the rest (bearing in mind the weights assigned to products prepared by the production unit for which a special deflator is used).

III.3.   Coordination with the different basic statistics and National Accounts

Since the industrial surveys and the MIE are already in a position to change the base using the data obtained in preparing the Input/output table, this procedure should be adopted for all exercises at the same time and without forgetting national accounts. A basic change only in the basic statistics would lead not only to confusion among users but would make it necessary to work for a time with both series: the old 1993 base (for providing the necessary information for computing industrial GDP) and the new base (for giving updated information). It is estimated that by the middle of the current year at the latest, both basic statistics and the National Accounts will have a new base year: 1997=100.

III.4   The change in the base year in business statistics

As already shown in section II.1, the MIE, (which like the Monthly Industrial Survey has as its current base: 1993=100) is the instrument used to monitor the business climate. The criteria used for changing the base year are the same, especially in view of the fact that the industrial climate is subject to change. In the case of the business surveys, deferring the change in the base year poses additional problems to those that can arise in the case of industrial surveys. The greater competitiveness, productivity and modernization of the productive structures are not duly absorbed in indicators whose adjustments lie solely in the development of physical quantities. For this reason, it may be valid to change the base year for the Monthly Industrial Estimator at least every three years; unless there is an update in the Input/output table or an industrial census for the purpose, the Annual Industrial Survey will be used.

IV.   Greater use of on-going programmes

IV.1.   Monitoring technological innovation of industrial firms

In mid-1997, the "National Survey on the Technological Behaviour of Argentine Industrial Firms" was launched as part of the agreement signed with the Secretariat for Science and Technology which falls under the Ministry of Culture and Education.

The register of industrial firms surveyed was put together on the basis of a sample of 3,200 local units covered in the MIS; the field exercise, data entry and criteria used for expansion all came under the responsibility of INDEC.

The results published for that study detail the specific features of the process of incorporation, adaptation and generation of technology in the Argentine manufacturing sector in the light of new local conditions. This study is to be updated periodically.

IV.2.   <u>Providing results by strata of firms (case of small and medium-sized enterprises)</u>

The need for reliable information with respect to the segment of small and medium-sized industrial enterprises leads us to prepare a specific panel of indicators for estimating the development thereof. While there is currently no survey directed to the universe of small and medium-sized businesses, the MIS is a preliminary approximation which gives a fairly accurate picture of the current state of the sector.

This preliminary study allows us to know, for example, the difference between the behaviour of a particular company and that of other companies in the same branch of activity. This, together with other characteristics of small and medium-sized businesses, will enable us to determine the case of launching a specific survey for the sector or to continue using the data base of the MIS.

IV.3   <u>Other cases</u>

As part of the Input/output table exercise, other surveys were conducted in 1998 in order to move forward with certain studies relating to other sectors linked to manufacturing.

- **Module on freight costs and distribution margins**

Information was requested on freight charges by third parties for raw material purchases and distribution margins applied by clients of surveyed companies to the main product manufactured by the local unit responding to the questionnaire.

- **Module on channels for purchases in local units**

Information was requested on the shares of raw material purchased by the local unit on the external and domestic markets as percentages of total raw material purchases.

- **Module on marketing channels in local units**

Companies should declare the share of products manufactured by them as a percentage of total sales and that of the marketing activities developed by the local unit on the external and domestic markets.

V.   Relationship with the provinces

V.1.   <u>Assistance to Provincial Offices</u>

Progress has been made recently in providing training to the different provincial statistical offices. While the samples used in the industrial surveys are representative at the national level, historically, INDEC processed —and in some cases used— provincial units belonging to a provincial survey. This procedure was observed basically when the Annual Survey sample had to be expanded to produce the input/output table. From this time, there has been more regular contact with the provinces which legitimately wish to have their own numbers as proxies for provincial GDP. INDEC assisted in ensuring consistency of questionnaires as well as in dispatching provincial files as promptly as possible. When requested by the provincial offices it, INDEC survey takers assist with the preparation of the provincial sample and we also provide training in the different work programmes Some provinces also started to work with business indicators, using the methodology of the Monthly Industrial Estimator. Much interest has also

been shown in the development of qualitative surveys for measuring the expectations of provincial entrepreneurs.

During the current year, the provinces will receive assistance with the development of computer programmes consistent with the plans of the Monthly Industrial Survey. Once provincial statistics are further established, the timeliness and quality of national surveys can be improved.

V.2.   Improving processing time

In addition to the technological progress referred to in terms of improving processing time, there are other tasks that must be completed in order to comply with established goals. Experience shows that some provinces do not comply strictly with deadlines for collection of questionnaires and firms are not advised of the need to submit information on a timely basis and in due form. One of the problems arising is that the respondents in small towns know personally the surveyors or officials of the provincial statistical offices and, on some occasions, these offices are reluctant to apply for sanctions against those who fail to submit their questionnaires. These are not generalized cases, but they do arise. One solution suggested by INDEC is that claims against reluctant firms should be tackled directly. Initial experience in this regard is encouraging.

Since participation in the INDEC survey exercises is mandatory, as pointed out in section 1 of this study, ideally, firms should be made aware of the importance of statistics. As already indicated, one way of achieving this is by providing data that the firms consider relevant for their business operations and which are not published in the regular publications.

INDEC hopes to be in a position to obtain provisional results of the annual survey in the same year in which the exercise is conducted. It also wishes to obtain a list of products in the same calendar year as the survey.