



**UNITED NATIONS**  
**ECONOMIC AND SOCIAL COUNCIL**



Distr. **B0008**  
 LIMITED

E/CN.14/NAC/73  
 19 June 1979

ENGLISH  
 Original: ENGLISH

ECONOMIC COMMISSION FOR AFRICA

Seminar on Price Statistics  
 Addis Ababa, 25-29 June 1979

**PRODUCERS' PRICES FOR INDUSTRIAL GOODS**

Table of Contents

	<u>Paragraphs</u>
I. Introduction.....	1 - 2
II. Definition of Producers' Prices.....	3 - 4
III. Selection and Specification of Items.....	5 - 22
A. Selection of commodities.....	6 - 9
B. How many price reports per commodity.....	10 - 12
C. Selection of specific items within commodities.....	13 - 19
D. Sampling selection of items.....	20 - 21
E. Non-sampling selection of items.....	22
IV. Selection of Reporting Units.....	23 - 39
A. Identifying the reporting units.....	24 - 28
B. Selection of reporting units.....	29 - 30
C. Sample selection of units.....	31 - 35
D. Non-sampling selection of units.....	36 - 39
V. Price Observation .....	40 - 50
A. Intra - Company transactions.....	41 - 42
B. Class of customer.....	43 - 44
C. Volume of sale.....	45
D. Multiple delivery orders.....	46 - 47
E. Shipping items.....	48
F. Commodity taxes.....	49 - 50

## I. INTRODUCTION

1. This paper will confine itself to the collection of data at producers' prices in the ISIC groups 2 and 3, namely mining and manufacturing and covering only the domestic producers. The paragraphs that follow are extracts from the "Manual on Producers' Price Indices for Industrial Goods" prepared by the United Nations Statistical Office. This manual is still under the process of production and will be circulated to all the statistical offices as soon as it has been completed. It describes how price statistics should be collected and processed to construct indices for groups of commodities and for the output of various mining and manufacturing activities.

2. For our purpose of discussion, the secretariat thought it better to extract the main sections of the manual that highlight the problems of data collection. These include selection and specification of items, selection of reporting units, and price observation. For more details covering a wide range of topics, refer to the manual as soon as available.

## II. DEFINITION OF PRODUCERS' PRICES

3. This paper deals with the procedures which may be used to measure the prices at which producers in mining and manufacturing activities sell their output. "Producers' prices" differ from "purchasers' prices" because they exclude the trade margins and transport costs which may be incurred in delivering the output from the producer to the purchaser.

4. As used in this paper, the term "producers' prices" should not be confused with "producers' values" as defined in A System of National Accounts (SNA). "Producers' values" in the SNA refer to the values of commodities at the establishment of the producer including all commodity taxes (such as sales taxes or excise duties) levied on that output. When these commodity taxes are excluded, output, in SNA terminology, is said to be valued at "approximate basic values". The term "producers' prices" as used in this paper may refer to goods valued on either basis - i.e. excluding commodity taxes.

## III. SELECTION AND SPECIFICATION OF ITEMS

5. This section describes the procedures by which commodities and items within commodities may be selected for periodic price reporting. For the most part the selection of commodities is discussed without reference to the selection of reporting units - i.e., the firms, establishments, or enterprises which produce them. This distinction is somewhat artificial since in most cases the choice of commodities to be priced and the identification of respondents are not carried out separately. Logically however, it is clear that two distinct issues are involved, and that at least conceptually the selection of commodities should precede the choice of reporting units.

### A. Selection of commodities

6. The starting point for the selection of the items to be priced is the compilation of a list of all commodities produced in the country by establishments engaged in mining, quarrying, and manufacturing. The list should show commodities inasmuch detail as possible and must give the value of output or sales of each goods during a recent year. If possible the list will also give information on the number of producers and where they are located, the growth in sales in recent periods, and the price dispersion or range for each commodity. A census of production covering all industrial

establishments is clearly the most suitable source for such a list. In practice, however, relatively few countries have ever undertaken a comprehensive survey of this kind.

7. An alternative approach in these circumstances is to start with a list of establishments classified by kind of activity and showing total estimated sales or output of each establishment. In most countries establishment lists of this kind will already have been drawn up by the statistical office since they are a basic tool for collecting most kinds of economic statistics. An establishment list gives only indirect and very aggregative information on commodities. It may show for example that there are a certain number of establishments in major group 341 of ISIC - "manufacture of paper and paper products" - but it would not show the large variety of different commodities produced by establishments, including characteristic products ranging from wood pulp and paper board to envelopes and wallpaper, as well as secondary non-characteristic commodities like tar-coated paper or printed cards and stationery. An establishment list will therefore have to be supplemented by commodity information from other sources. These may include export statistics, information from trade associations, or data on household consumption. Clearly it will also be essential to make direct contracts with at least the larger establishments on the list.

8. When the first stage of the selection process is completed (how the selection is made is discussed shortly) the result should be a list of commodities to be priced, related non-selected commodities, and weights expressed either as money amounts or proportions. Every commodity on the list must be accounted for - that is it must have been chosen as a commodity to be priced, or its weight must have been assigned to a related item selected for pricing. This stage in the selection process might conclude as in Table 3.1. The 8-digit commodity code shown in this table is used purely for purposes of illustration, and many countries would find it neither feasible nor necessary to use a classification as detailed as this.

Table 3.1      Commodities to be priced

<u>Code</u>	<u>Latest value</u>	<u>Selected for pricing</u>	<u>Value weight</u>
XXXX 66--	500		
661-	240		
6611	100)		
6612	80)	X	240
6613	60)		
662-	60		
6621	25)		
6622	35)	X	60
663-	200		
6631	55)		
6632	8)		
6633	7)		
6634	125)	X	200
6635	5)		

9. In this example the simplest possible approach has been taken. One eight digit commodity has been selected to represent each seven digit group. However, it will generally be possible to make the code structure more suitable for price collection purposes. Commodity codes like the ICGS and most national classifications have been established for the collection of production and industry information and may not be well designed for the selection of commodities to be priced in an ongoing monthly or quarterly price survey.

How many price reports per commodity ?

10. In designing the price collection programme the statistician faces the issue of whether to spread the observations over a large number of commodities with each thinly reported or to select a limited number of commodities and collect many observations for each one. The extreme solutions to the problem would be to use the available resources to collect a single observation for every eight digit number of commodity or to collect hundreds of observations for a small number of commodities.

11. Obviously neither of these extremes is to be recommended. The first approach would give acceptable price indices for total manufacturing and maybe the next level of disaggregation but not for individual commodities. The other extreme would produce high quality price indexes for a small number of commodities but would give poor quality estimates at high levels of aggregation. In the first case there is redundancy in the number of commodities collected. In the latter case there is redundancy in the number of observations for the few commodities for which prices are collected. The statistician must select a course within these extremes by a process which minimizes variances within established goals given the resources available for conducting the survey. If all the information on variances of price changes were available the process would be one of meeting target variances for commodities and the various levels of aggregation.

12. Because of limited knowledge about the variance of price-changes, trial and error inevitably plays a part in setting up the price collection programme. However, once the survey has been running for a year or two, the statistician will be in a better position to determine whether more or less observations are needed for particular commodities. If there are six price reports for a given item and all show a very similar price movement the statistician might consider dropping some of them so as to increase the number of price reports for an item which shows greater variation in price changes. 1/

---

1/ In addition to a simple inspection of the price-data, the technique of step-wise regression can be used to determine whether there is "redundancy" in the price data. A stepwise regression analysis shows how many observations are required to estimate the actually observed price index for a given commodity with a correlation coefficient of 1.0. A description of such an analysis as applied to the U.S. Wholesale Price Index is given in the Wholesale Price Index: Review and Evaluation, op.cit.

Selection of specific items within commodities

13. The next stage in planning the over-all programmes will be to specify within the eight digit code the specific items to be priced. For example, within the commodity "men's shirts", which particular type (size, colour, sleeve-length, material, etc.) is to be selected for pricing? At this stage a basic strategy issue is encountered. The specification may be drawn up in great detail or it may be prepared on a relatively broad basis. There are advantages and disadvantages in each approach.

14. If the specifications are highly detailed - e.g. men's shirts with collar, long-sleeved, plain white, all cotton, non-shrink, non-crush - the statistical office may have better control of the process and the collected prices may be sufficiently homogeneous so that actual prices can be published. However, extremely detailed specifications may result in difficulties in collecting price observations since the product may not be made month after month. Furthermore, for some producers a very narrowly specified commodity may be incidental to its production of the eight digit commodity and unrepresentative.

15. A broadly specified commodity on the other hand is more flexible and permits some adaptation to the circumstances of individual respondents. Then reporting arrangements must be made with each enterprise so that sub-specifications within the specifications are determined. One respondent for example, may report for white shirts while another reports for striped shirts, or a firm producing low priced shirts reports their prices while a manufacturer of a high priced line of shirts reports for them. Obviously the statistical office has a more complicated task of controlling the operation because it must ascertain that reporting units continue to price the identical items month after month. A further drawback is that it is not feasible to publish the actual average price in such situations since the prices collected cover a range of specifications within a commodity code.

16. In general, however, the advantages of broad specifications will usually outweigh the disadvantages, and it is probably the superior course for commodities for which it is not intended to publish average prices. It introduces greater flexibility in the programme, probably creates greater representativeness of reported prices and is likely to increase the number of usable observations. Furthermore establishing the specifications is not a one time operation. The specifications must be continuously reviewed, revised and updated as commodities undergo change.

17. An important question which arises at this stage is how many items each respondent should be asked to report. From an efficiency point of view one would obviously wish to collect as many observations as possible from a firm. Once all the overheads and collection costs are taken into account, collecting and compiling a few more observations adds only marginally to the processing costs. However, public relations and respondent burden must also be considered and some limits imposed. A firm requested to report thirty price observations each month may be unwilling to co-operate but would do so if asked to report seven or eight observations.

18. To avoid imposing too great a reporting burden on respondents while at the same time keeping costs to a minimum it is desirable to set upper and lower limits on the number of price reports from each respondent. A typical rule would be that no respondent is asked to report more than a dozen prices nor less than three. These limits might occasionally be exceeded if particular respondents are exceptionally co-operative or especially unhelpful.

19. For the actual selection of items sampling or non-sampling procedures may be used. These will be considered separately.

#### Sampling selection of items

20. If random sampling procedures are adopted, the rules should ensure that items over a fixed value of sales or output are selected with certainty, while the remaining products are picked on a random probability basis. In a full sampling structure each commodity selected within a firm for pricing monthly will have a weight associated with it. The weight will be a composite of the probability of selection of the enterprise and the probability of selection of the commodity. The specific item to be priced will be the specification within the commodity.

21. A sampling scheme will require periodic maintenance or updating. This may be needed to identify new enterprises (births) but also for cases where a firm has expanded its production line to new products which should be given a chance of selection. This, of course, must be part of a comprehensive plan so that no bias is permitted to creep into the sampling or estimation structure.

#### Non-sampling selection of items

22. The advantage of random sampling is that it is an impartial way of selecting the items to be priced, and if a non-sampling approach is used it is important that the selection of items is based on some set of formal rules. These rules should prevent the omission of items merely because it is likely that it will be difficult to collect comparable prices from one period to another, and the rules should also avoid allowing the respondent to have too much influence in the selection process. Even if it is assumed that no harm is intended the potential respondent will be influenced in ways that do not conform with accepted statistical standards. The respondent may suggest the reporting of items for which prices do not change or do not change inordinately. The aim is to choose items which account for a substantial proportion of the respondent's turnover, which have been in production for a reasonably long period (and which are not about to be discontinued in the near future), and which are representative of the bulk of the respondent's output.

#### IV. SELECTION OF REPORTING UNITS

23. The previous section dealt with the specification of commodities and the selection of particular items for regular price reporting. This section will discuss how the actual respondents should be chosen. The main issues dealt with are the definition of reporting units, the relative merits of sample versus non-sampling selection, and how best to secure the co-operation of prospective respondents.

Identifying the reporting unit

24. There are two parties to every sales transaction and each party will ordinarily have knowledge of the price and other terms of the transaction. It would appear therefore that one might define the reporting unit for collecting producers' prices as either the producer or purchaser. Traditionally statisticians have collected price observations from the seller, probably because for each seller there are hundreds or thousands of purchasers. Each producer of textiles for example, may sell to hundreds of apparel and furniture producers and to many wholesalers. Thus, the producer may be thought of as covering many more transactions for the commodity. In areas where discounting and negotiating arise, however, true transaction prices may be easier to collect from purchasers.
25. It would seem difficult to collect prices from the purchaser on a recurring and comprehensive basis since it is unlikely that the kind of refined processing needed to remove purchases from wholesalers, from foreign supplies, etc. will be feasible. There may be some commodities where collecting prices from purchasers is preferable because producers are unable or unwilling to provide real transaction prices, but the recommendation of this manual is that to the extent possible the price observations should be collected from producers.
26. Having decided to collect prices from the producer, it is now necessary to examine the kind of producing unit which should be asked to submit the price reports. If all producing units are enterprises or firms with one establishment each, no problems arise. The enterprise and the establishment have the same boundaries and if it falls into the survey there is only one possible reporting unit. An enterprise, however, may consist of many establishments and these may be organized within the enterprise in a variety of ways. Standing between the establishment and the enterprise may be legal subsidiaries or division.
27. For our purpose we shall call such intermediate levels of organization divisions. Generally, divisions of an enterprise will have the responsibility of managing the production and sale of groups of commodities. This, an enterprise may have a chemical division and a cement division, or a household appliances division and a machinery division. Further, the division may consist of several establishments engaged both in manufacturing and in related kinds of activities such as sales, warehousing or the purchasing of materials. Large enterprises of this type will generally be included in the price surveys, and the question arises as to which organizational unit within the enterprise should be asked to submit the price reports.
28. The statistical office may have no options; the enterprise may insist on some way of reporting. To the extent that the statistician does have the choice, it is clear that reports should be sought from the unit which concludes the sales. In practice this unit will normally be located at the headquarters of the company or division. The establishment of a large multi-establishment enterprise will generally not be a good reporting unit for price information. Within such an enterprise the establishment is frequently treated simply as a production unit and does not have access to all of the latest pricing information. Discounts from a list price may not be known at the establishment level, and where both order prices and