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INDEXES OF QUANTUM AND UNIT VALUE FOR EXTERNAL TRADE

(Memorandum prepared by the Secretary-General)

1. Countries whose exports account for about 80 per cent of world exports compute and publish indexes of quantum and unit value for their total merchandise imports and their total merchandise exports. Most of these countries make the computation quarterly or monthly. Each index is used not only in the country to whose trade it refers but also by individuals and institutions in other countries and by international agencies. Because of the great and growing interest in quantum and unit value indexes the Commission may wish to consider whether there are any recommendations it might make which, without much increasing the burden on governments, would markedly increase the international usefulness of the indexes.

2. At its fourth session, the Commission expressed the view that countries might usefully prepare separate quantum indexes of their trade with each of their principal trading partners. Certain countries make such calculations from time to time, but no country appears to have found it possible systematically to publish calculations of this kind. It is probable that much of the difficulty experienced in making these calculations arises from the smallness of the figures in many items of the trade accounts when the operation is confined to transactions with a single country. The index numbers are, of course, weakest when the amount of trade in each component item of the calculation is small. In addition to this, countries themselves normally base the price and quantity analyses of their external trade on categories of goods

rather than on subdivisions by countries. It may, therefore, be desirable to seek improvement of international comparability by means of subdivisions of quantum and unit value indexes by commodity classes rather than by means of subdivisions by countries. Indexes based on commodity classes can of course be used for approximate analysis of trade with groups of countries where the transactions fall into distinguishable commodity classes for which index numbers may be compiled. There is a great need for index numbers of quantum and unit value applicable to classes of commodities, such as, (1) food, (2) raw materials, (3) manufactured goods. These commodity index numbers can be used for analysis of trade between groups of countries, such as the industrial countries and the raw material exporting countries.

3. Now that countries are, to such a large extent, compiling their trade-by-commodity figures according to the Standard International Trade Classification (SITC), the Commission may wish to investigate the possibility of progressively standardizing sub-indexes by commodity classes on the basis of the SITC so that, on the one hand, countries can make meaningful comparisons between their sub-indexes by commodity and those of other countries, and, on the other, international agencies can combine the national indexes to make world and regional totals by commodity class.

4. For both national and international analyses of external trade the distinction of the three categories - food, raw materials, manufactured goods - is important. For more detailed analysis, index numbers corresponding to the sections of the SITC would be necessary. Using the SITC sections, it is relatively simple to obtain index numbers for the three categories: food, raw materials, and manufactured goods. The only calculations necessary below the level of the SITC sections are in section 3 - mineral fuels, etc., and section 4 - animal and vegetable oils, etc. The calculations involved are merely those required to aggregate section 2 with group 311 - coal, coke and briquettes, group 312 - petroleum, crude and partly refined, group 411 - animal oils and fats, and group 412 - vegetable oils. The resulting aggregate may be described as raw materials (other than food). SITC sections 0, 1 may be combined to provide an aggregate of food, beverages and tobacco, although many countries may wish to keep the totals separate. The remainder of the total trade, excluding section 9, consists of manufactured goods. The scheme may be summarized as follows:

SITC	Detailed Indexes	Summary Indexes
0	Food	Food, beverages and tobacco
1	Beverages and tobacco	
2	Crude materials except fuels	Raw materials (other than food, beverages and tobacco)
311 [1/]	Coal, coke and briquettes	
312 [1/]	Petroleum, crude and partly refined	
411 [2/]	Animal oils and fats	
412 [2/]	Vegetable oils and fats	
313-5 [1/]	Petroleum products, gas and electric energy	
413 [2/]	Oils and fats, processed, and and waxes	
5	Chemical elements and compounds	Manufactured goods (other than food, beverages and tobacco)
7	Machinery and transport equipment	
6 and 8	All other manufactures	

1/ Combination of these items yields indexes for Fuel, Power and Petroleum products.

2/ Combination of these items yields indexes for animal and vegetable oils, fats and waxes.

5. The Commission may wish to consider requesting countries to undertake the sub-division of their quantum and unit value indexes according to the scheme outlined above. Countries which are unable readily to compile index numbers for each of the SITC sections and groups discussed above, may find it possible to compile the summary indexes for the three large classes.

6. In its study of indexes of wholesale prices and industrial production the Commission was aware that the problem of obtaining good basic data is fundamentally much more important than the problems of the different weighting patterns. The reliability of the index numbers is affected by:

(a) arbitrary decisions such as those involved in weighting systems;

(b) inaccuracies in the basic data.

7. In the case of external trade statistics, the data on which quantum and unit value indexes may be based are, in all essentials, already at hand in national trade statistics, and because of the general use of mechanographic methods the cost of re-arranging the data is small. It has often been remarked that a good check on the validity of an index computed by a certain formula is to compute the same index by another formula and compare results. Because their weighting patterns represent opposite extremes, the comparison between the results of the Laspeyres and Paasche formulas is particularly useful. In the case of external trade, the periodic computation of one of these to check the other is not expensive and is therefore often recommended.

8. A unit value (or quantum) index is a weighted average of unit value (or quantity) ratios, the ratios being compiled from the quantity and value figures for the most detailed commodity headings of the trade statistics[3/]. The usefulness of the index therefore depends on the reliability of:

(a) the weighting system (which may be disturbed by changes between the base period and the current period in the general pattern of trade)

3/ Throughout this paper it will be assumed that indexes have been corrected for the effect of headings not used directly in their computation.

(b) the unit value (or quantity) ratios (whose meaning may be affected by changes in the composition of the goods in the detailed commodity headings)[4/]

A comparisen of the results of Paasche and Laspeyres formulas is a check on the reliability of (a) and not of (b).

9. Experiments made by the Statistical Office indicate that (b) is at least as important a source of "inaccuracy" in indexes of external trade as is (a). Besides the relatively random effect on indexes of accidental changes of composition of the trade in individual commodity headings, there may be systematic effects, for instance those due to the treatment given new or improved products. The introduction of a new product may produce either of the following effects:

(a) If a product is first included as a new commodity in the index when it is new and expensive, a fall in price as the technique of its production improves will tend to depress the index of unit value in comparison with an index into which the new product was not introduced until after its production was technically stabilized.

(b) If a product already included in an index markedly improves in quality with a consequent rise in price, the unit value will tend to be higher if the improved product was entered under the same commodity heading as the unimproved than it would be if a new commodity heading were opened for the improved product.

10. The evaluation of the "accuracy" of an index should therefore preferably concern itself not only with the weighting pattern but also with the reliability of the basic unit value ratios (one for each heading of the trade statistics) from which the index is built up. For instance, at the time of evaluation, each heading might be examined for changes of composition perhaps by seeking the advice of commodity experts, by comparing the corresponding basic unit value ratios with

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4/ Because unit value ratios can be compared with wholesale price indexes and in general can be more effectively scrutinized for consistency and sense than can quantity ratios, the operations referred to below will be thought of as being applied to the unit value index. The connexion with the quantum index can then always be made through the well-known formula involving the value index.

other data such as relevant wholesale price indexes, the unit value ratios for related commodities, etc. In this way the range of the basic unit value ratios as well as of the weights can be estimated.

11. Once these ranges are estimated, it is a relatively simple matter to calculate the resulting range of the quantum and unit value indexes and thus to assess the "accuracy" of the indexes.

12. The Commission has recognized that, as the interval between the period to which an index number refers and the base period increases, the "accuracy" of the index decreases. Because of the financial and administrative difficulties involved in changing the base of a wholesale price index or an index of industrial production, the Commission did not feel it could lay down criteria for establishing the period for which an index could be allowed to run without a change in calculation base. Since the financial and administrative difficulties are much less in the case of quantum and unit value indexes for external trade, the Commission may feel justified in recommending some fixed period, such as five years, as the maximum period without a change of computation base, which is consistent with good practice. The Commission may wish the Statistical Office to obtain the views of national statistical offices on the feasibility of establishing a procedure for making a periodic check on the "accuracy" of their indexes of external trade to determine, inter alia, whether or not a change of base is advisable.
