Appendix 2: Draft ILO Resolution concerning consumer price indices

The following draft resolution on the CPI was prepared by Bill McLennan (former Australian Statistician) working with the consumer price experts of the ABS for the International Labour Office (ILO) for consideration at the next meeting of the Experts on Labor Statistics to be held in October 2001.

With the concurrence of the ILO, this draft was submitted as a room document. The ILO would welcome any comments.

Draft CPI resolution

Terminology

For the purposes of this resolution, the following are defined:

- "outlet" indicates a shop, market, service establishment, or other place where goods and/or services are sold or provided to consumers for non-business use

- "consumption" indicates all goods and services (or "items") that are consumed by households but not for business purposes or for accumulation of wealth

- "scope of the index" indicates the population groups, geographic areas, items and outlets for which the index is established

- "reference population" indicates the population that falls within the scope of the index

- consumption expenditure can be measured in terms of "transactions", "use", or "payment":

  - "transaction" indicates that the total value of all goods and services delivered during a given period be taken into account, irrespective of whether they were wholly paid for or not during the period

  - "use" indicate that the total value of all goods and services actually consumed during a given period should be taken into account

  - "payment" indicates that the total payment made for goods and services during a given period should be taken into account, without regard to whether they were delivered or not during the period

- "bias" occurs when the CP1 produces results which are systematically higher or lower than the actual price changes; this may happen at the overall or detailed levels.

The nature of a Consumer Price Index (CPI)

CPIs are important current economic indicators that are constructed to provide a general measure of the changes over time in the prices faced by households for consumer goods and services. They are usually produced on a monthly or quarterly basis, but sometimes annually. To be most useful, CPIs need to be produced on a timely basis.

They normally refer to all resident households, but may only refer to a subset of households, e.g. all wage and salary earners, urban dwellers etc. Additional price indexes may be

calculated for particular types of householders, e.g. pensioners, or for particular geographic areas, e.g. all urban areas.

It is possible, of course, at the national level to produce and publish more than one index (although only one would be referred to as the CPI), if the requirements of the users justify the extra expense. The corollary though is that if a single index is produced, it cannot be expected to fully meet all needs.

The uses of a Consumer Price Index

In the majority of countries, CPIs were originally compiled to enable the automatic adjustment of wages to compensate wage earners for changes in the prices of goods and services that they bought. More recently, the principal use of the CPI in many countries has shifted to one of providing a general measure of price inflation for the household sector as a whole. Use of the CPI to adjust the incomes of social welfare beneficiaries is another important use of the CPI in many countries.

CPIs are also used for many purposes for which the relationship to the price experiences of households is less clear. These include measuring the overall rate of price inflation for the whole economy, the adjustment of government fees and charges, and the adjustment of amounts in commercial contracts. In most of these cases, the CPI is used because technically more appropriate measures simply do not exist or because other characteristics of the CPI are seen to outweigh any technical deficiencies (e.g. high profile, wide acceptance, predictable publication schedule, non-revisability etc.).

In practice, it is the main use, or uses, which determine what type of index is produced in terms of the range of goods and services covered, the extent of the geographic coverage, the consumers it relates to, how the item domain is defined, and the concept of price followed. If there are several major uses, it is likely that compromises may have to be made with how the CPI is designed, and policy issues may have more sway than technical ones in making such decisions.

Scope of the index

A national index should be defined to cover all households in the country. If any households, groups of people or geographic areas are excluded, say for reasons of practicality or costs, then this should be explicitly stated. In the case of an income compensation index, a particular group of households, say wage and salary earners, may be targeted. In the case of a domestic inflation index, it may be appropriate to target sales within a region rather than the experiences of households resident within a region.

The CPI should also relate to all consumer goods and services of relevance to the reference households, without any omission of tobacco or other things that may be regarded as nonessential or undesirable. To assist those users who may wish to exclude particular categories of goods and services for particular applications, analytical series may be constructed.

Transactions, use or payment

Each country should explicitly consider whether the objectives of the index are best satisfied by defining the item domain in terms of transactions, use, or payments, taking into account the theoretical index concept (i.e. whether the index is to be an inflation or a compensation measure, and whether or not a COLI approach is to be followed), acceptability to users, the availability of data, and resource requirements. These issues particularly arise in dealing with

own-account consumption, owner-occupied housing, consumer credit, durable goods, remuneration in kind, and goods and services provided without charge or subsidised by government.

The most contentious of these issues is the treatment of owner-occupied housing. It is also an important issue as, in most countries, a significant proportion of households are owner occupied. Two approaches predominate: one is aimed at measuring the prices actually paid for housing, with many possibilities existing for what is priced, while the other is aimed at measuring the flow of housing services consumed. The decision on the approach to follow should be determined by the purpose of the index and by the acceptability of the decision to the users.

The compilation of a CPI

A long-term CPI series is normally made up of a number of short-term indexes that are chain linked together. These short-term indexes usually cover the period from one reweighting to the next. This approach allows for changes in the expenditure patterns of households to be incorporated in the CPI.

Basket

For practical reasons, each short-term index is normally a measure in the change over time in price of a fixed basket of goods and services. The items selected for the basket should adequately represent all consumer goods and services, while taking into account the feasibility and costs of collecting the required price information. Decisions on the composition of the basket flow direct from the choice between transactions, use or payment, and should, if possible, be based on the results of a household expenditure survey and/or other available information on expenditure patterns.

The items selected for the basket are generally grouped into similar categories, say, according to the COICOP classification of division/group/classes, to enable the index to be more useful for analytic purposes. The proportion of the expenditure relating to the items in each class defines the weights to be used at the class level. (If second-hand purchases are represented in the index, then the weights for second-hand goods should be calculated net of the corresponding sales including trade-ins.) These weights normally remain fixed, and because of this care needs to be taken to ensure that the weighting is derived from a reliable source such as a household expenditure survey or final household consumption expenditure of the national accounts. In any event, the objective should be to adopt weights that are most likely to be representative of the future behaviour of household consumers rather than precisely reflect the activity of a particular period that may be abnormal in some way - weights need to be scrutinised to ensure that they make sense.

These weights should be reviewed as often as there is accurate and reliable data available to do so, but at least every five years. The weights should be revised if the review shows it is necessary. This approach is important as it minimises the adverse impact changes in consumer preferences and item substitutions might have on the index.

The items selected for the basket in this way are normally too broad to be of direct use in selecting price samples. These items need to be subdivided into a finer level of commodity detail, say from bread to types of bread, and decisions need to be taken on which commodities price samples should be constructed, say wholemeal bread. This is not a simple process. The factors that need to be taken into account include the relative significance of each commodity, their likely price behaviour and the practicality of measuring prices to constant quality. During the life of each short-term index, the commodities finally selected may change and the

weights used below the class level may change as well. These aspects need to be under continual review.

Elementary aggregates

The grouping of items and outlets for which it is decided to construct price samples are referred to as 'elementary aggregates'. The selection of the specific observations (items and outlets from which to price) to be included in each elementary aggregate has a significant bearing on the overall quality of the CPI. For this purpose, surveys of sales in retail outlets and household surveys on point of purchase can provide valuable information concerning the breakdown of consumption by outlet type and by region. In the absence of such information statisticians should rely on their judgement to determine how the sample of prices is distributed across outlets.

An appropriate sampling approach needs to be followed to select both the outlets and the items so as to ensure the prices collected are representative and sufficient to meet the requirements of the index. Probability sampling, although it involves some difficult practical problems, does make it possible to estimate sampling errors. Purposive samples of one type or another are often followed, and in those cases statisticians should apply the best judgement and available data to ensure a representative sample is selected. Notwithstanding the selection process, the sample which is selected should reflect the importance of the items in the basket, the number of outlets for the items including the existence of chains of retailers, the dispersion of prices across outlets, and the geographic spread of the outlets. The sample of outlets and items should be reviewed periodically, and it should be updated if this is necessary to maintain its representativeness.

In calculating price indexes for elementary aggregates, it is recommended that geometric means be used where possible. However, the geometric mean may not be appropriate for all elementary aggregates particularly where the price may be zero or where consumers are unable to substitute. In those cases it is recommended that the elementary aggregate index be constructed using the relative of arithmetic mean prices approach. The arithmetic mean of price relatives approach is to be avoided if at all possible due to its known upward bias.

Index calculation

Indexes at the class/group/division/national level are then, as required, calculated as a weighted arithmetic average of the elementary aggregate indexes, but many types of weighted average may be used. There is a growing consensus that, theoretically, a superlative index number formula should be used. The Fisher index is one strong possibility.

In practice, in terms of an official statistics agency producing a timely product, this is not a feasible approach. Only two real options exist. The first, is to calculate the average using a Laspeyre's approach which relies on the weights for the base period. The second is to use the Constant Elasticity of Substitution (CES) approach, which relies on base period weights and on estimating the coefficient of substitution for all the goods in the basket.

In both cases it may be advisable to also calculate the index retrospectively when current weights become available, say using the Fisher approach. By comparing the difference between this index and the Consumer Price Index as calculated would give some indication of the combined impact of income change, preference change and substitution effects over the period in question, which may be important information for policy users.

Price Collection

The quality of the price data is the crucial determinant of the reliability of the index. Hence, standard methods for collecting and processing price data should be developed and procedures put in place for collecting them systematically and accurately at regular intervals. Price collectors should be well trained and well supervised, and should be provided with a good manual explaining all the procedures they have to follow.

The specifications used for pricing, including the final selection of the particular variety and size by the price collector where relevant, serve the purpose of securing comparability between the successive periods and assisting selection and evaluation of substitutes. The specifications should be precise enough to identify all the characteristics that are necessary to ensure that as far as possible identical goods and services are priced in successive periods in the same outlet. It should be noted that the relevant use characteristics of the goods or services should include, for example, terms of payment, conditions of delivery, guarantees and type of outlet.

The prices to be collected are the regular actual transaction prices, including indirect taxes, paid by the reference population. Where prices are not displayed, where quantity units are poorly defined or where actual purchase prices may deviate from list or fixed prices, check purchases by the price collectors are advisable and a budget should be provided for these purchases. Where prices are subject to significant fluctuations over the month or quarter, it is desirable to collect them more than once during the month or quarter.

Prices charged for stale, shop-soiled, damaged or otherwise imperfect goods sold at clearance prices should be excluded unless they are a permanent and widespread feature of market conditions. However, sale prices, discounts, cut prices and special offers should be included when applicable to all customers and when the goods and services are offered in their normal availability.

Particular attention should be paid to the way in which pricing is distributed in time. In the case of perishable goods, attention should also be paid to the time of day that is selected for price collection.

Prices should be collected in all types of markets that are important. These may include open-markets and black-markets as well as state-controlled markets. Where more than one type of market is important, an appropriately weighted average should be used in the calculation of the index. Where centrally regulated or centrally fixed prices are collected, checks should be made to ascertain whether the goods and services in question are indeed sold and whether these prices are in fact observed.

In periods of price control or rationing, where limited supplies are available at prices which are held low by subsidies to the sellers, by government procurement, by price control etc., these prices as well as those charged on unrestricted markets should be collected. They should be combined in a way that uses the best information available with respect to the actual prices paid and the relative importance of the different types of sales.

Consistent procedures should be established for dealing with missing price observations whatever the cause, including seasonally unavailable, unable to contact, non-response, rejected observation, and temporarily out of stock. (Seasonal goods are a particular problem which is handled in many different ways including seasonally adjusting the prices, using very complex systems of changing weights, and even excluding such items from the basket.)

Substitution of a priced item will be necessary when it disappears permanently from the outlet(s) in which it is priced, and may be necessary when it is no longer available in

sufficient quantities or under normal sale conditions. Clear and precise rules should be developed for identifying the substitute item. Precise procedures should be laid down for price adjustment with respect to the difference in characteristics when substitutions are necessary. Responsibility for such evaluation should be clearly established.

Substitution of an elementary aggregate will be necessary if all items in an elementary aggregate disappear from most or all outlets. In such cases, if a substitute item representing the elementary aggregate cannot be found and appropriate adjustments for the difference in characteristics made, it may be necessary to redistribute the weight assigned to the elementary aggregate among other elementary aggregates within the next highest level of aggregation possible.

Substitution of an outlet may be necessary if an outlet disappears or because of a decline in representativeness or disappearance of an item from an outlet. Rules should be established to ensure that the price collector makes a correct choice with respect to a new outlet, and that the adjustments are made, if need be, to take account of the change in outlet or the change in the nature of the outlet. The rules should be consistent with the objectives of the index and with the way in which the price collection sample has been determined.

From time to time new product and services, or major changes to existing ones, come onto the market, and begin to account for significant household expenditure. If the product is a completely different one, it would normally only be considered for inclusion during one of the periodic review and reweighting exercises. (This is one reason why it is important to conduct such exercises regularly.) However, when it can be considered within an existing expenditure class, it would normally only be included if it quickly gains a substantial share of the market which is likely to be sustained, and the price structure for the item is not unduly influenced by factors such as prestige, novelty value, or relative scarcity of the product. All items introduced are done by means of linking, so that the new item itself does not affect the level of the index.

The price data sent in by the price collectors should be reviewed and edited for comparability, substitutions, unusual or simply large price changes and for price conversions of goods priced in multiple units or varying quantities, where the units or quantities do not form part of the specification. Care must be taken to examine unexplained price changes to determine whether they are genuine price changes or changes in quality. Also, there should be procedures, such as repricing in the same outlets, for checking the reliability of the price data.

The feasibility of using scanner data to collect prices for some items in the basket should be investigated carefully. If it can be done in a timely and cost effective manner, large data sets may be available. Even if it is impractical to use scanner data for the direct construction of price indices, the data should provide valuable insights into changing consumer behaviour, as well as some hard data for sample selection purposes and hedonic quality adjustments. The possibility of using data on e-commerce in the same way should not be overlooked.

Quality

Pricing to constant quality means taking account of changes in the quantity, quality and in the terms of sale of the goods and services in the basket, and it is vitally important that this is done well so that pure price changes can be measured.

For basic consumer goods, the application of this principle is relatively straight forward, for more complex durable goods the concept becomes more difficult to apply, and for services items it is generally difficult to do so. For this reason, it is necessary to collect a considerable amount of information each month or quarter, depending on the periodicity of the collection, about the items for which prices are collected in order to identify possible changes in the

quality of the goods and services in the basket. Some of this information is obtained in the course of collecting prices, but often the most important source of information on quality change is via interviews with manufactures, importers or wholesalers of goods included in the CPI and by the study of articles and advertisements in trade publications etc. Changes in quality may also be detected in the course of checking the prices data.

When a quality change has been detected, a value must be placed on that change, so that a true price movement may be estimated. This is difficult to do well, and a wide variety of approaches may need to be adopted depending on the particular goods and services involved. Great care needs to be exercised because the accuracy of the index depends on the validity of this process.

Special Cases

In some cases, such as insurance, health care, second-hand goods etc., it may not be possible to use the methodology as described above. In those cases, a special approach may be needed, which will differ by country depending on the institutional arrangements and the purpose of the index, or the category may simply be excluded from the index. Users should be informed of the method followed.

Bias

Many contemporary comments have been made about the biases inherent in compiling CPls. The focus has been on the difference between the measured index and some expected view of how the index should behave, but these differences are difficult to quantify. In practical terms, compilers of CPIs need to be aware of the possible sources of bias, and to take steps in the practical choices made during the index construction and compilation processes to minimise them.

In general, an index which regularly updates weights and baskets, utilises unbiased elementary aggregate formulae, considers quality change issues well, allows adequately and correctly for new products, and takes proper account of substitution issues will be more relevant and have a reduced potential for bias.

Dissemination

A consumer price index should be computed and publicly released as quickly as possible after the period the index refers to. Rules relating to the release of the data should be established, made publicly known and strictly observed.

Sub-indexes should also be released, and consideration should be given to releasing them in accordance with the COICOP division/group classification or other similar grouping. Sub-indexes for different regions or socio-economic groups or for special analytical purposes (e.g. travellers' expenses, imported items) might be publicly released if they were judged to be useful and reliable, and the cost warranted it. Average prices or price ranges for important and reasonably homogeneous items may also be released.

In general, retrospective corrections (e.g. as a result of an error in the data or in calculation) of the publicly released indexes should only be done when absolutely necessary because of the difficulties such corrections cause for indexed contracts or payments. As an alternative, necessary corrections might be made to the index in the subsequent period, and in which case a full explanation should be provided in order to avoid misinterpretation of the resulting short-term price movement.

In order to ensure public confidence in the index, a full description of the methodology and data sources should be published and made widely available to data users. The document(s) should include, among other things, details of the weights, objectives of the index, and a discussion of the precision or the index. However, the precise identities of the outlets and goods and services for which prices are obtained and any other details which, if disclosed, would adversely affect the representativeness or the index should, not be revealed.

Other matters

The agency responsible for the index should consult with representatives of users on major issues. One way of organising such consultation is through the establishment of advisory committee(s) on which users and outside experts might be represented.

The exclusion of shelter and financial services from the all-items index makes the rates of price change more comparable across countries, although it does not eliminate all the difficulties encountered when making such comparisons. Countries should, therefore, provide for dissemination at the international level of an index that excludes shelter and financial services, in addition to the all-items index.