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Draft Chapter Outline for the Revised CPI Manual

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Prepared in consultation with the Inter-secretariat Working Group on Price Statistics (IWGPS) and the Technical Expert Group on CPI (TEG-CPI)

Introductory comments

In September 1998 a meeting of international organisations was convened to discuss the possibility of updating a manual on the compilation of CPI. This meeting agreed that such a manual should be developed. As part of the process and as a member of the newly formed Inter-secretariat Working Group on Price Statistics (IWGPS), the OECD undertook to co-ordinate and maintain the chapter outline for the new manual on CPI. This document represents the latest version of the CPI manual outline.

Initial drafts of the outline were developed in late 1998 based on extensive input from different members of the IWGPS. Subsequently, a draft of the outline was discussed at the first meeting of the CPI Technical Expert Group (TEG-CPI) in February 1999. Discussion at this meeting examined very closely all aspects of the outline and the current document represents, aside from a few subsequent comments, the suggested scope and intent of the manual as determined at that meeting.

It is inevitable that changes to the outline will be made during the course of drafting and following further comments and suggestions from others outside the IWGPS and TEG-CPI, in particular from members of the Ottawa Group. Consequently, this outline should be regarded as “work-in-progress”. Nonetheless there are two basic ideas which have been introduced and should ideally remain. The first is the link between a manual on CPIs and planned manuals on other price statistics, in particular PPIs. At the first meeting of the IWGPS it was agreed that the mandate of the group should be to cover all price statistics. In this spirit, this draft outline has been structured to try as far as possible to allow those topics that are common across all price statistics to be easily identified. Indeed, while there are some issues that are only relevant for CPI, many issues such as index number theory, price concepts and weighting are common. It is anticipated that where such overlap exists the text should be written in such a way that the same text can be placed in each relevant price manual.

Consistent with this idea is the development of a chapter which describes a framework for price statistics into which CPIs, PPIs and other price indices can be placed. It is envisaged that such a framework would be a common chapter in any price manual. In the draft outline it is presented as Chapter 2.

The second basic idea for the manual is to try to explain both the conceptual basis for price index calculation and the practical requirements of index calculation. The current outline attempts to separate these areas although this is not easy in some cases and it is likely that some overlap and repetition will occur.

The draft outline is divided into chapters and sections with points and sub-points indicating main items for discussion within each section. The sub-points are intended to be reasonably exhaustive although not all items will have been included. The aim at this stage is to ensure that the coverage of the chapter, sections and points is as complete and usefully ordered as possible. For some chapters a small introductory paragraph has been written to help explain the general intent of the chapter.

The CPI manual will be developed over the next two years drawing on the significant work which has been done in recent years, particularly within the Ottawa group but also in the context of the development of HICPs and the Boskin report. The manual will also draw on planned work such as papers for this Ottawa group meeting and for the November 1999 ECE/ILO meeting on CPI. One important piece of work that is currently underway concerns the development of a common terminology.

Comments and suggestions on the draft outline are welcome and indeed are sought from as wide an audience as possible, including international organisations, international forums and working parties, and national statistical offices. In particular, comments are sought regarding:

- the coverage of the manual;
- its applicability to a wide variety of countries and situations;
- its presentation of emerging issues in CPI compilation; and
- the overall structure of the manual.

Any comments should be sent to Carl Obst at the OECD using the contact details below. Versions of the outline will also be made available on the ILO website (<http://www.ilo.org/public/english/120stat/index.htm>).

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DRAFT CHAPTER OUTLINE FOR REVISED CPI MANUAL

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1. Introduction

- I. Background and purpose of the revision
 - discussion of the revision process
 - links to relevant groups such as the Ottawa Group
 - identification of users of the manual & target audience
 - references to related manuals and handbooks
- II. History and development of the CPI
 - discussion of the changing uses of the CPI (*links to Ch 3*)
 - international standards
- III. Structure of the manual
 - explanation of the split between conceptual and practical sections
 - description of how the manual can be used

PART I : CONCEPTS OF CPI MEASUREMENT

2. The system of price statistics

This chapter should try to present an overall framework for price statistics making clear the way in which CPIs fit within the broader context of price statistics and other economic statistics. To achieve this, some recourse to basic concepts will be required but undue duplication with Chapter 4 should be avoided. In part this chapter should be seen as a central element for both this manual and other price statistics manuals and it is envisaged that this chapter would not need significant rewriting for inclusion in the planned PPI manual.

- I. A framework for price statistics
 - basic definition of a price index
 - the variable price change cannot be directly observed and must be estimated by measuring actual prices at different points in time
 - basic concepts of price, valuation, timing (*links to Ch 4*)
 - consideration of the relationship between price index concepts and national accounts concepts
 - the meaning of accrual
 - market and non-market prices
 - description of a supply/use and stage of processing/production type framework for positioning of various price statistics
 - relationships between basic concepts of CPI, PPI, WPI, TPI
 - introduction to issues of classification

II. Links between price statistics and the national accounts

- the use of price statistics in the national accounts
 - deflators for final and intermediate expenditure
 - deflators for output
 - deflators for calculation of consumption of fixed capital
 - measurement of real holding gains
 - links to social accounting matrices (SAMs) and satellite accounts

III. Links between price statistics and other statistics

- brief description of PPPs
- links between price statistics and labour statistics

3. Uses of the CPI

I. Potential uses and limitations of the CPI

- recognition of the different CPIs that can be compiled (more detail in Ch 3.II)
- general discussion of the range of uses of the CPI and the appropriateness of choosing different CPIs for different purposes
- issues to consider
 - broader measures of inflation (*links to Ch 4.IV*)
 - distinction between sources of inflationary pressure and price change
 - tax switches between direct and indirect taxation
- possible uses (not exhaustive)
 - general measure of inflation
 - target rate for central banks
 - general wage indexation
 - indexation of government benefits
 - indexation in legal contracts and regulations
 - taxation liability adjustment
 - adjustment of bond payments
 - current cost accounting
 - national accounts deflation
 - retail sales deflation
 - wage deflation
 - measurement of internal changes in purchasing power

II. A family of CPIs

- listing and description of the variety of CPIs and related indexes which can be compiled, and purposes for which they would be compiled, for example
 - national CPIs (by product, by expenditure class)
 - index of underlying / core inflation
 - compensation indexes
 - national HICPs
 - zone / country group CPIs (e.g. zone HICPs)
 - regional / sub-national CPIs
 - population sub-group CPIs (e.g. income deciles)

4. Economic concepts of the CPI

I. Brief description of consumer theory

- discussion of basic concepts of consumer theory and how they relate to measuring price change
- issues to consider
 - preference and choice
 - indifference curves
 - substitution and income effects
 - elasticity
 - quality change (*links to Ch 13 & 15*)
 - effects of new products and establishments (*links to Ch 13 & 15*)
 - role of fashion and taste (*links to Ch 13 & 15*)

II. Price concepts (*links to Ch 2*)

- definition and discussion of relevant price concepts
 - unit values
 - relative prices
 - basic and purchasers prices
 - temporal price changes and spatial price changes
 - margins (including retail and transport margins and the link to service quality change)
 - gross and net prices
- definition and discussion of the treatment of particular price index issues (*links to Ch 9*)
 - indirect taxes
 - price discrimination
 - controlled and subsidised prices
 - price reductions (rebates, discounts, supplements, sales, bonuses)
 - bundled prices
 - tips

III. CPI scope and transaction boundaries (*links to Ch 2 and 7*)

- defining the broad scope of the CPI
 - consideration of changes in quality of life and the environment as part of a CPI
- more specific boundary considerations
 - investment versus consumption
 - intermediate versus final consumption
 - consumption versus expenditure
 - flows versus stocks
 - distinction between acquisition, use, payment

IV. The measurement of inflation and the cost of living

- explanation of the debate
 - fixed basket / fixed utility
 - links to substitution effects
 - broader measures of inflation
- implications for choice of CPI approach / link to purpose of CPI

5. Index numbers

I. Types and properties of various indexes

- brief and precise definitions of Laspeyres, Paasche, Fisher and Tornqvist
- exact and superlative index numbers and measuring the cost of living
- discussion of elementary index formula

II. Concepts concerning the aggregation of index numbers

- social welfare functions (*links to Ch 4*)
- plutocratic / democratic weighting

III. Chain linking and related issues

- discussion of underlying aims of chain linking with links to
 - substitution effects
 - new products and establishments
 - aggregation
 - formula effects
- related issues
 - price “bouncing”
 - Sauerbeck indexes

IV. Index bias

- introduction to the concept of index bias – details in Ch 15

PART II : THE PRACTICE OF CPI MEASUREMENT

6. An overview of CPI compilation

This chapter should provide a summary of the basic steps which are undertaken in CPI compilation. It is designed to give those with little knowledge of price index construction some broad idea of the issues involved before commencing detailed discussion of the relevant issues in the following chapters. Of particular importance is an explanation of the different levels at which an index is constructed.

I. The basic steps in CPI compilation

- define the purpose and coverage of the index
- choose appropriate classifications
- identify the level at which sampling and explicit weighting should be undertaken
- select a sampling technique
- specify the products for price collection
- collect the price observations
- select the weights according to the classification structure
- calculate elementary and upper level indexes
- adjust for quality and variety change
- release the index

II. Sampling budget and other practical considerations

- discussion of issues to be considered in determining which type of index is possible - defining priorities

7. Coverage and classification of the index

I. Population coverage

- discussion of the possible household reference populations

II. Price coverage

- discussion of monetary transaction based sales prices
- treatment of investment
- treatment of non-market goods and services
- treatment of government and intermediate consumption
- treatment of the illegal / hidden economy
- treatment of subsidised prices

III. Geographic coverage

- treatment of foreign purchases of residents/ domestic purchases of non-residents
 - index in terms of the purchaser
- application of treatment to a regional / sub-national level

IV. Statistical units

- discussion of various price collection points
 - retail establishments
 - mail order
 - internet
 - central / head offices

V. Classification

- discussion of the role of classification in the CPI
 - determining scope of price collection
 - determining appropriate weights and weighting level
 - determining categories and level of item specification
 - determining publication level
- brief discussion of key / common classifications
 - CPC
 - COICOP

8. Sampling issues in price collection

I. Sample frames

- coverage and frame limitations

II. Sample design

- the nature of the elementary index
- principles of selection
 - clarity
 - error minimisation
 - classification
- methods of sampling
 - geographical localities
 - establishments
 - items
 - varieties in each establishment
 - in time

III. Optimum sample allocation

IV. Sample rotation

V. Sampling techniques

- probability sampling
 - simple and stratified random sampling
 - sampling proportional to size
- non-probability sampling
 - cut-off sampling
 - judgmental sampling
 - quota sampling

VI. Statistical errors (*links to Ch 15*)

- sampling errors
- non-response bias
 - methods for adjustment

9. Price collection

I. Timing of collection

- point-in-time index or period index
- discussion of frequency of collection (monthly/quarterly/annual)
 - definition of a price observation
 - issues for high/hyper inflation situations

II. Item specification

- description of the purpose of item specification
- discussion of the different levels at which specification can be carried out (e.g. product / variety)
- generic versus specific specification
- presentation of check lists

III. Collection procedures

- questionnaire design (sample forms)
- survey techniques
- field procedures
 - price reductions (rebates, discounts, supplements, sales, bonuses) (*links to Ch 4*)
 - others (*links to Ch 13*)
- electronic reporting (use of hand held computers)
- central / head office collection

IV. Related issues

- use of scanner data
- related collection issues for PPPs
- documentation/storage of collected information

10. Weights and sources for weights

This chapter is designed to present information on the role of weights in the calculation of an index and possible data sources for weights. A more detailed explanation of the procedures for using weights is in chapters 11 and 12.

I. Consumption expenditure and weights

- description of the role of weights
- discussion of value versus quantity weights at different levels of the index
- treatment of unimportant expenditures
- seasonality in weights

II. Basic heading or stratum weights

- classification issues
- sources for weights
 - household expenditure surveys
 - retail sales data
 - national accounts
 - production and trade statistics
 - population censuses

III. Item and quote weights

- explicit and implicit weights
- classification issues
- sources for weights
 - selection probabilities of items and establishments
 - selection probabilities of item specifications
 - POPs
 - other sources

11. Calculation of the index : routine production

I. Calculation of elementary indexes

- description and discussion of alternative formula

II. Calculation of higher level indexes

- description and discussion of alternative formula

III. Geographic aggregation

IV. Estimation of missing price observations

- in-house procedures when price exists but not collected
- in-house procedures when price does not exist
 - lack of supply (shortages) or lack of demand

V. Computation

- description and discussion of alternative techniques
 - manual (algorithms)
 - computerised (software choices)

VI. Related issues

- the calculation of sub-indexes
- annual average index estimation
- average prices
- calculation of user specific indexes

12. Calculation of the index : chain linking and reweighting

The aim of this chapter is to examine issues which are more specific to reweighting. In part this is due to the fact that this is often a task performed infrequently but there are also a number of considerations which fall outside the scope of routine production of the index and deserve separate mention.

I. Frequency of weight and basket updates

- choice of weight year (weight month)

II. Updating weights and baskets

III. Linking reweighted index to historical index (chain linking)

- procedures for linking baskets
- procedures for linking weights
- partial re-weighting

IV. Issues concerning seasonality in weights

V. Weighting errors (*links to Ch 15*)

- problems of coverage

13. Quality and variety change

- I. Appearance/disappearance of products/establishments
 - procedures for allowing for such change
 - item and outlet monitoring
- II. Item substitution
 - procedures for item substitution
- III. Adjusting for quality change
 - explicit adjustment - standard approaches
 - differences in production costs
 - quantifiable item characteristics
 - price ratios
 - option cost
 - explicit adjustment - advanced approaches
 - hedonics
 - other approaches
 - implicit adjustment
- IV. Treatment of seasonal products / estimation of seasonal effects

14. Treatment of specific products

The aim of this section is to take a case study type approach looking at the concept and measurement issues on a product by product basis. Many of the ideas will be a repetition of the contents of earlier chapters but the perspective should allow a thorough understanding of the issues facing index compilers and act as a ready-reference to particular issues. The chapter should be structured using the basic COICOP classification.

- I. Food, beverages and tobacco
 - problems of pricing fresh produce
 - seasonality
- II. Clothing and footwear
 - problems of pricing clothing and footwear
 - seasonality
 - measuring quality change
 - fashion and taste changes
- III. a) Housing - owner occupied housing / rented housing
 - sampling issues for rented and owner-occupied dwellings
 - alternative approaches and data requirements for the treatment of owner occupied housing
 - specific issues for countries in transition

b) Water, electricity, gas and other fuels

 - problems of pricing utilities services
 - non-market services issues
- IV. Furnishings, household equipment & routine maintenance
 - general problem of including consumer durables
 - credit purchases
 - issues concerning second hand goods
 - problems of pricing computers
 - measuring quality change

V. Health

- problems of pricing medical care services
 - non-market goods and services issues
 - pricing bundled goods and services
 - measuring quality change

VI. Transport

- problems of pricing cars
 - measuring quality change
 - fashion and taste changes
- problems of pricing public transport
 - non-market goods and services issues

VII. Leisure, entertainment and culture

- treatment of package holidays
- treatment of gambling

VIII. Education

- problems of pricing education services
 - non-market services issues
 - measuring quality change

IX. Hotels, cafes and restaurants

- problems of pricing tourist expenditure

X. Miscellaneous goods and services

- problems of pricing telecommunication goods and services
 - measuring quality change
 - adjustment for new products
 - separation of goods and services
- problems of defining and pricing financial services
 - treatment of indirect charges by financial institutions
 - treatment of interest rates
 - treatment of consumer credits
- problems of defining and pricing insurance services
- problems of pricing social protection
 - non-market services issues
 - treatment of retirement homes
- other goods and services
 - treatment of jewelry
 - treatment of membership fees and gifts
 - treatment of own account production and income in kind

15. Issues in index quality

This chapter covers two main themes in index quality. One is the issue of index bias of which awareness has been heightened following the release of the Boskin Report a few years ago. The second is other types of measurement error, some of which have been discussed in earlier chapters. In particular, this chapter should clearly distinguish between a CPI's conceptual relevancy with respect to specific uses and the accuracy of measuring price change as conceptually defined. Drawing these two themes together is done to consider the measurement of index error or bias and also to consider ways of minimising this error. Often the methods for minimisation are similar across the two themes.

I. Types of index bias

- description of types of index bias (*links to Ch 4 and 5*)
 - item substitution bias
 - establishment substitution bias
 - elementary index bias
 - quality adjustment bias
 - new product bias
 - seasonal bias

II. Types of data error

- description of types of data error
 - statistical sampling errors and non-response (*links to Ch 8*)
 - weighting errors including issues of coverage (*links to Ch 12*)
 - processing errors, response errors and non-statistical sampling errors

III. Measuring error and bias

- estimation of variance
- estimation of total index bias
- other issues

IV. Procedures to minimise error and bias (*links to Ch 8, 12, 13 and 16*)

- description of relevant issues and approaches

16. Organisation and management

I. Practical steps in compilation (*links to Ch 6*)

- field procedures
- central office procedures
- treatment of processing errors, response errors and non-statistical sampling errors

II. Organisational structure and responsibility

III. Quality control in index construction

- data editing techniques
- process control

IV. Computing resources

V. Training requirements

17. Publication, dissemination and user relations

I. Types of presentation

- time series presentation of level and change
- seasonal adjustment and smoothing of the index
- analysis of contributions to change
- presentation of related / alternative measures
 - core inflation
 - sub-aggregate indexes
- economic commentary and interpretation of the index
- model press release, bulletin and methodology statement
- the IMF GDDS and SDDS / other international standards

II. Dissemination issues (*links to Ch 16*)

- timing of release
- timeliness of release v data accuracy
- access to data
- issues of electronic/internet release
- confidentiality

III. User consultation

- explanation of different uses of CPIs (*links to Ch 3*)
- presentation of methodology
- role of advisory committees
- presentation of issues concerning index quality

18. Glossary / nomenclature

19. References / bibliography

20. Index

Annexes

I. International classifications

- COICOP
- CPC

II. Resolution on CPI of the 14th International Conference of Labour Statisticians (ICLS)

III. Draft resolution on CPI for the 17th ICLS

IV. HICP