

Reader's Guide

International manuals in economic statistics have traditionally provided guidance about concepts, definitions, classifications, coverage, valuation, recording data, aggregation procedures, formulas, and so on. They have mainly aided compilers of the relevant statistics in individual countries. This *Manual* shares this same principal objective.

The *Manual* will benefit users of export and import price indices (XMPIs), such as government and academic economists, financial experts, and other informed users. XMPIs are key statistics for policy purposes. They attract much attention from the media, governments, and the public in most countries. Both the XPI and the MPI are sophisticated concepts that draws on a great deal of economic and statistical theory and requires complex data manipulation. This *Manual* is therefore also intended to promote greater understanding of the properties of XMPIs.

In general, compilers and users of economic statistics must have a clear view of what the statistics measure, in principle. Measurement without theory is unacceptable in economics, as in other disciplines. This *Manual* therefore contains a thorough, comprehensive, and up-to-date survey of relevant economic and statistical theory. This makes the *Manual* self-contained in both the theory and practice of XMPI measurement.

The *Manual* is, consequently, large. Because different readers may have different interests and priorities, it is not possible to devise a sequence of chapters that suits all. Indeed, users do not read international manuals from cover to cover in that order. Manuals also serve as reference works. Many readers may have interest in only a selection of chapters. The purpose of this Reader's Guide is to provide a map of the contents of the *Manual* that will aid readers with different interests and priorities.

The *XMPI Manual* has a similar structure and similar material to, that of the *CPI Manual* and *PPI Manual*. The CPI, PPI and XMPI for the large part have similar theoretical underpinnings and face similar practical problems in their compilation. There are of course important differences and each *Manual* adapts the discussion of principles and practices to meet the needs of the index concerned. In particular the XMPI has three new chapters: Chapter 2 on unit value indices, Chapter 19 on transfer pricing, and Chapter 24 on the measurement of terms of trade effects. All three *Manuals* are self-contained.

A. An Overview of the Sequence of Chapters

As mentioned in the preface, the chapters of this *Manual* are arranged so that practical and operational issues (Chapters 1–14 and the Glossary) are supported by theoretical underpinnings (Chapters 15–24). Specifically, the *Manual* is divided into four parts:

Part I (Chapters 1–5) examines XMPI methodology, uses, and coverage;
Part II (Chapters 6–12) covers compilation issues;
Part III (Chapters 13–14) considers operational matters; and
Part IV (Chapters 15–24) explores conceptual and theoretical issues.
The remaining paragraphs in this section give synopses of the individual chapters.

A.1 Part I: Methodology, Uses, and Coverage

Chapter 1 is a general introduction to the theory and practice of XMPIs. It is intended for all readers. It provides the basic information needed to understand the later chapters and a summary of index number theory, as explained in much more detail in Chapters 16–24. It then provides a summary of the main steps involved in compiling XMPIs, drawing on material in Chapters 4–10. It does not provide a summary of the *Manual* as whole nor does it cover specific topics or special cases that are not of general relevance.

Chapter 2 starts with a strategic decision XMPI compilers must make, their reliance on unit value indices from customs data as surrogates for price indices. Chapter 3 outlines the history of price indices and how XMPIs have changed in response to the demand for broader measures of price change. Chapter 4 presents a few basic concepts, valuation principles, classifications, and the scope or coverage of an index. The scope of XMPIs can vary significantly from country to country.

A.2 Part II: Compilation Issues

Chapters 5-10 form an interrelated sequence of chapters describing the various steps involved in compiling XMPIs, from collecting and processing the price data through calculating the final index. Chapter 5 discusses deriving the value weights attached to the price changes for different goods and services. Administrative data from customs authorities and establishment censuses or surveys, supplemented by data from other sources, typically provide the weight data.

Chapter 6 deals with sampling issues. The approach of this manual to the collection of prices is to favor the use of surveys of establishments, as opposed to unit values from customs authorities, though issues relating to the use of unit value indices are outlined in Chapter 2. XMPIs are essentially estimates based on samples of the prices of commodities imported and exported by a sample of establishments. Chapter 6 considers sampling design and the pros and cons of random versus purposive sampling.

Chapter 7 describes the procedures used to collect the prices from a selection of establishments and products. It deals with topics such as questionnaire design, specifying the transactions selected, and methods for collecting data, including the use of electronic media.

Chapter 8 addresses the difficult question of how to adjust prices for changes over time in the quality of the goods or services selected. Changes in value due to changes in quality count as changes in quantity, not price. Disentangling the effects of quality change poses serious theoretical and practical problems for compilers. Chapter 9 addresses two closely related questions: first, how to deal with goods and services that disappear from the sample; second, how new goods or services not previously produced can enter the sample.

Chapter 10 gives a step-by-step description of editing procedures, calculating elementary price indices from the raw prices collected for small groups of products, and the resulting averaging of the elementary indices to obtain indices at various levels of aggregation up to the overall XMPIs. The chapter also provides a description of the process for the periodic update of the value weights.

Chapter 11 deals with a few cases that need special treatment. For example, it presents methods for handling Chapter 11 deals with a few cases that need special treatment. It presents methods for handling examples of hard-to-measure goods and services including agriculture, crude petroleum and gasoline, metals, computers, motor vehicles, clothing, air freight, air passenger fares, crude oil tanker freight, ocean liner freight and travel and tourism. The chapter concludes with a discussion of more general issues including duties, currency conversion, and intra-company transfers. Chapter 12 provides an overview of the errors and biases to which XMPIs may be subject.

A.3 Part III: Operational Issues

Chapter 13 deals with issues of organization and management. Conducting the price surveys and processing the results make for a massive operation that needs careful planning, organization, and efficient management. Chapter 14 addresses publication and dissemination standards for the XMPI results.

A.4 Part IV: Conceptual and Theoretical Issues

Chapter 15 marks a break in the sequence of chapters because it is not concerned with compiling XMPIs. Its purpose is to examine the place of XMPIs in the general system of price statistics. The measurement of series of the volume of GDP (expenditure) requires deflators of the nominal values of the GDP components that include exports and imports. It will be seen that a nonresident's perspective is required in this regard—a perspective that identifies exports as a use by nonresidents and imports as a supply by nonresidents. However, the XMPIs for measuring changes in terms of trade, transmission of inflation via exports and imports, and productivity analysis requires a resident' perspective that may be embedded in the production accounts of the *1993 SNA Rev. 1*. These approaches are outlined in Chapter 15, and their implications for theory and measurement discussed in Chapters 4, 18, and 20.

Chapters 16–18 provide a systematic and detailed exposition of the index number theory underlying XMPIs. These chapters examine different approaches to index

number theory. Collectively, they provide a comprehensive and up-to-date survey of index number theory, including recent methodological developments as reported in journals and conference proceedings.

Chapter 16 provides an introduction to index number theory, focusing on breaking up value changes into their price and quantity components. Chapter 17 examines the axiomatic and stochastic approaches to XMPIs. The axiomatic, or test, approach lists many properties that are desirable for index numbers to have and tests specific formulas to see whether they have them.

Chapter 18 explains the economic approach, using the economic theory of producer behavior for the XPI and consumer behavior for the MPI, to deriving both a theoretical XPI and a theoretical MPI, against which index numbers used in practice can be compared and biases identified. Although these economic indices cannot be calculated directly, a certain class of index numbers, known as “superlative” indices, can be expected to approximate them in practice. From an economic perspective, the ideal index for PPI purposes should be a superlative index, such as the Fisher index. The Fisher index also is a very desirable index on axiomatic grounds.

Chapter 19 considers the practical issue of *transfer pricing* between divisions of a multinational corporation that has establishments in more than one country. Tax differentials between countries may provides an incentive for the company to strategically price its international transactions to minimize the overall tax burden of the multinational corporation.

Chapter 20 presents a constructed data set to explain the numerical outcomes of using different index number formulas. It shows that, in general, the choice of index number formula can make a notable difference, but that different superlative indices all approximate one another.

Chapter 21 addresses the important question of what is the theoretically most appropriate elementary price index formula to use at the first stage of XMPI compilation *if* no information is available on quantities or values. This has been a comparatively neglected topic until recently, even though the choice of formula for an elementary index can have a significant impact on the overall XMPIs. The elementary indices are the basic building blocks used to construct higher-level XMPIs. Consideration is also given to the use of unit values as surrogates for prices at this first stage. Such unit values have the benefit of including information on quantities and, for strictly homogeneous commodities, benefit from time aggregation properties *within* the period they are reported, usually a month. However, unit value *indices* for prices of heterogeneous commodities, as is typical of data from customs authorities, are prone to bias. The stance of the Manual is to focus on prices of tightly defined commodities from establishment surveys at the elementary level.

Chapters 22, 23, and 24 conclude the *Manual*. They address three conceptually difficult issues. Chapter 22 considers the theoretical issues of adjusting for quality

change on the basis of the hedonic approach. Chapter 23 examines the treatment of seasonal products. Chapter 24 provides a framework for the analysis of changes in a nation's terms of trade.

A glossary of terms and a bibliography appear at the end of the sequence of chapters.

B. Alternative Reading Plans

Different readers may have different needs and priorities. Readers interested mainly in compiling XMPIs may not wish to pursue all the finer points of the underlying economic and statistical theory. Conversely, readers more interested in the use of XMPIs for analytic or policy purposes may not be interested in the details of the conduct and management of price surveys. Not all readers will want to read the entire *Manual*, or even want to follow the same reading plan.

However, all readers, whether users or compilers, will find it useful to read the first three chapters. Chapter 1 provides a general introduction to the whole subject by providing a review of the XMPI theory and practice appearing in the *Manual*. It provides the basic knowledge needed for understanding later chapters. Chapter 3 explains the need for XMPIs and their uses. Chapter 4 examines many basic conceptual issues and the scope of XMPIs.

B.1 A Compiler-Oriented Reading Plan

Chapters 2, 5–14 are mainly for compilers. They follow a logical sequence that roughly matches the various stages of compiling XMPIs. They start with data sources for measuring price changes, unit value indices versus survey price indices, deriving the value weights and collecting the price data and finish with publishing the final index. Chapter 13, on organization and management, is intended for both managers and compilers. It discusses many important issues on the structure and mechanisms that statistical offices need to monitor, control, and assure the quality of XMPIs and to be efficient in the use of resources. Chapter 14 is on the effective dissemination of the results.

Chapter 15 is for both compilers and users of XMPIs. It places XMPIs in perspective within the overall system of price indices.

The remaining chapters, Chapters 16–24 are mainly theoretical. Compilers may find it necessary to follow certain theoretical topics in greater depth, in which case they have immediate access to the relevant material. It would be desirable for compilers to acquaint themselves with at least the basic index number theory set out in Chapter 16 and the numerical example developed in Chapter 20. The material in Chapter 21 on elementary price indices is also important for compilers.

B.2 A User-Oriented Reading Plan

Although all readers should find Chapters 1-4 useful, and Chapters, from 5-14 are mainly for compilers, several topics have aroused great interest among many users.

Chapters 8 and 9 discuss the treatment of quality change, item substitution, and new products. Users may also find Chapter 10 helpful because it provides a concise description of the various stages of compiling XMPs.

Chapter 12, “Errors and Bias,” and Chapter 15, “The System of Price statistics” are also of interest to both users and compilers.

Chapters 16-24 cover the economic and statistical theory underlying XMPs, and they are likely to be of interest to many users, especially professional economists and students of economics.

C. A Note on the Bibliography

In the past, international manuals on economic statistics have not usually provided references to the associated literature. It was not helpful to cite references when the literature was mostly confined to printed volumes, including academic journals or proceedings of conferences, found only in university or major libraries. Compilers working in many statistical offices were unlikely to have ready access to such literature. However, this has changed with the Internet and the World Wide Web, which make all such literature readily accessible. Therefore, this *Manual*, as was the case with the *CPI Manual* and *PPI Manual*, breaks with past tradition by including a comprehensive bibliography to the large literature that exists on index number theory and practice that many readers are likely to find useful. In addition, websites are referenced that contain specialist papers on index number theory and practice, including those of the Ottawa Group and the Voorburg Group.