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 PPIs, such as government and academic economists, financial experts, and other informed users. The PPI is a key statistic for policy purposes. It attracts much attention from the media, governments, and the public in most countries. The PPI is a sophisticated concept 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 PPIs.

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 PPI measurement.

The *Manual*, consequently, is 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.

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 1–13 and the Glossary) are supported by theoretical underpinnings (Chapters 14–22). Specifically, the *Manual* is divided into four parts:

- Part I (Chapters 1–3) examines PPI methodology, uses, and coverage;
- Part II (Chapters 4–11) covers compilation issues;
- Part III (Chapters 12–13) considers operational matters; and
- Part IV (Chapters 14–22) 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 PPIs. 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 15–20. It then provides a summary of the main steps involved in compiling a PPI, drawing on material in Chapters 3–9. 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 outlines the history of price indices and how PPIs have changed in response to the demand for broader measures of price change. Chapter 3 presents a few basic concepts, principles, classifications, and the scope or coverage of an index. The scope of a PPI can vary significantly from country to country.

A.2 Part II: Compilation issues

Chapters 4–9 form an interrelated sequence of chapters describing the various steps involved in compiling a PPI, from collecting and processing the price data through calculating the final index. Chapter 4 discusses deriving the value weights attached to the price changes for different goods and services. Establishment censuses or surveys supplemented by data from other sources typically provide the weight data.

Chapter 5 deals with sampling issues. A PPI is essentially an estimate based on a sample of the prices of products produced by a sample of establishments. Chapter 5 considers sampling design and the pros and cons of random versus purposive sampling. Chapter 6 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 7 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 8 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 9 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 PPI itself. The chapter also provides a description of the process for the periodic update of the value weights.

Chapter 10 deals with a few cases that need special treatment. For example, it presents methods for handling seasonal agricultural and clothing products, petroleum refining, steel mills, electronic computers, motor vehicles, shipbuilding, construction, retail trade, telecommunication services, some financial services, legal services, and medical hospitals. Chapter 11 provides an overview of the errors and biases to which PPIs may be subject.

A.3 Part III: Operational issues

Chapter 12 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 13 addresses publication and dissemination standards for the PPI results.

A.4 Part IV: Conceptual and theoretical issues

Chapter 14 marks a break in the sequence of chapters because it is not concerned with compiling a PPI. Its purpose is to examine the place of the PPI in the general system of price statistics. The PPI is not a set of independent, isolated statistics. The flow of producer goods and services to which it relates is only one of a larger set of interdependent flows within the economy as a whole. The analysis of inflation requires more than one index, and it is essential to know exactly how the PPI relates to the CPI and to other price indices, such as indices of export and import prices. The supply and use matrix of

the *System of National Accounts 1993* (Commission of the European Communities and others, 1993) provides the proper conceptual framework for examining these interrelationships.

Chapters 15–18 provide a systematic and detailed exposition of the index number theory underlying PPIs. 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 15 provides an introduction to index number theory, focusing on breaking up value changes into their price and quantity components. Chapter 16 examines the axiomatic and stochastic approaches to PPIs. 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 17 explains the economic approach, using the economic theory of producer behavior. In this approach, an output PPI is defined as a "fixed-input" economic price index that assumes fixed technology. Changes in the index arise solely from changes in the output prices between two periods. An input PPI is defined as a "fixed-output" economic price index that also assumes fixed technology. Changes in the index arise solely from changes in the input prices between two periods. 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 18 deals with aggregation issues. Chapter 19 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 20 addresses the important question of what is the theoretically most appropriate elementary price index formula to use at the first stage of PPI 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 PPI. The elementary indices are the basic building blocks used to construct higher-level PPIs.

Chapters 21 and 22 conclude the *Manual*. They address two conceptually difficult issues. Chapter 21 considers the theoretical issues of adjusting for quality change on the basis of the hedonic approach. Chapter 22 examines the treatment of seasonal products.

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 PPIs may not wish to pursue all the finer points of the underlying economic and statistical theory. Conversely, readers more interested in the use of PPIs 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 PPI theory and practice appearing in the *Manual*. It provides the basic knowledge needed for understanding later chapters. Chapter 2 explains the need for PPIs and their uses. Chapter 3 examines many basic conceptual issues and the scope of a PPI.

B.1 A compiler-oriented reading plan

Chapters 4–13 are mainly for compilers. They follow a logical sequence that roughly matches the various stages of compiling a PPI. They start with deriving the value weights and collecting the price data and finish with publishing the final index. Chapter 12, 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 ensure the quality of the PPI and to be efficient in the use of resources.

Chapter 14 is for both compilers and users of PPIs. It places PPIs in perspective within the overall system of price indices.

The remaining chapters, Chapters 15–22, 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 15 and the numerical example developed in Chapter 19. The material in Chapter 20 on elementary price indices is also important for compilers.

B.2 A user-oriented reading plan

Although all readers should find Chapters 1–3 useful, and Chapters 4–13 are mainly for compilers, several topics have aroused great interest among many users.

Chapters 7 and 8 discuss the treatment of quality change, item substitution, and new products. Users may also find Chapter 9 helpful because it provides a concise description of the various stages of compiling a PPI.

Chapter 11, "Errors and Bias in the PPI," and Chapter 14, "The System of Price Statistics" are also of interest to both users and compilers.

Chapters 15–22 cover the economic and statistical theory underlying the PPI, 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 confined mostly 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* 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.