Preface

The ILO, IMF, OECD, UNECE, and World Bank, together with experts from a number of national statistical offices and universities, have collaborated since 1998 in developing this *Producer Price Index Manual*. In addition, these organizations have consulted with a large number of potential users of the *PPI Manual* to get practical input. The developing organizations endorse the principles and recommendations contained in this *Manual* as good practice for statistical agencies in conducting a PPI program. *Because of practical constraints, however, some of the current recommendations may not be immediately attainable by all statistical offices and, therefore, should serve as guideposts for agencies as they revise and improve their PPI programs.* In some instances, there are no clear-cut answers to specific index number problems such as specific sample designs, the appropriate index estimation formula to use with given data inputs, making adjustments for quality changes, and handling the appearance of new products. Statistical offices will have to rely on the underlying principles laid out in this *Manual* and economic and statistical theory to derive practical solutions.

A. Producer Price Indices

PPIs measure the rate of change in the prices of goods and services bought and sold by producers. An *output* PPI measures the rate of change in the prices of products sold as they leave the producer. An *input* PPI measures the rate of change in the prices of the inputs of goods and services purchased by the producer. A *value-added* PPI is a weighted average of the two.

The *PPI Manual* serves the needs of different audiences. On the one hand are the compilers of PPIs. This *Manual* and other manuals, guides, and handbooks are important to compilers for several reasons. First, there is a need for countries to compile statistics in comparable ways so they can make reliable international comparisons of economic performance and behavior using the best international practices. Second, statisticians in each country should not have to decide on methodological issues alone. The *Manual* draws on a wide range of experience and expertise in an attempt to outline practical and suitable measurement methods and issues. Such measurement methods and issues are not always straightforward, and the *Manual* benefits from recent theoretical and practical work in the area. Third, much of the written material in some areas of PPI measurement covers a range of publications. This *Manual* brings together a large amount of what is known on the subject. It may therefore be useful for reference and training. Fourth, the *Manual* provides an independent reference on methods against which a statistical agency's current methods, and the case for change, can be assessed. The *Manual* should serve the needs of users. Users should be aware not only of the methods employed by statistical offices in collecting data and compiling the indices, but also of the potential such indices have for errors and biases, so that users can properly interpret the results. For example, index number theory presents many issues on formula bias, and the *Manual* deals extensively with the subject.

Collecting data for PPIs is not a trivial matter. In practical terms, PPIs require sampling, from a representative sample of establishments, a set of well-defined products whose overall price changes are representative of those of the millions of transactions taking place. Statistical offices then monitor the prices of these same products on a periodic basis (usually monthly) and weight their price changes according to their net revenue. However, the quality of the commodities produced may be changing, with new establishments and commodities appearing and old ones disappearing on both a seasonal and permanent basis. Statistical offices need to closely monitor potential changes in quality. Yet the index compilers must complete the task of producing a representative index monthly, in a timely manner.

It is also important to have a well-developed theoretical basis for compiling such indices that is readily accessible for practitioners and users alike. There should be a firm understanding of user needs and how the index delivered fits both. Fortunately, there is a great body of research in this area, much of which is fairly recent. This *Manual* covers the theoretical basis of index numbers to help support some of the practical considerations.

This *Manual* provides guidelines for statistical offices or other agencies responsible for compiling a PPI, bearing in mind the limited resources available. *Calculating a PPI cannot be reduced to a simple set of rules or a standard set of procedures that can be mechanically followed in all circumstances.* Although there are certain general principles that may be universally applicable, the procedures followed in practice have to take account of particular circumstances. Statistical offices have to make choices. These include procedures for the collection or processing of the price data and the methods of aggregation. Other important factors governing methodology are the main use of the index, the nature of the markets and pricing practices within the country, and the resources available to the statistical office. The *Manual* explains the underlying economic and statistical concepts and principles needed to enable statistical offices to make their choices in efficient and cost-effective ways and to recognize the full implications of their choices.

The *Manual* draws on the experience of many statistical offices throughout the world. The procedures they use are not static but continue to evolve and improve, for a variety of reasons. First, research continually refines the economic and statistical theory underpinning PPIs and strengthens it. For example, recent research has provided clearer insights about the relative strengths and weaknesses of the various formulas and methods used to process the basic price data collected for PPI purposes. Second, recent advances in information and communications technology have affected PPI methods. Both theoretical and data developments can impinge on all the stages of compiling a PPI. New technology can affect the methods used to collect prices and relay them to the central statistical office. It can also improve the processing and checking, including the methods used to adjust prices for changes in the quality of the goods and services covered. Finally, improved formulas help in calculating more accurate higher-level indices.

B. Background to the Present Revision

Some international standards for economic statistics have evolved mainly to compile internationally comparable statistics. However, standards may also be developed to help individual countries benefit from the experience and expertise accumulated in other countries. All countries stand to gain by exchanging information about index methods. The UN published the existing *Manual on Producers' Price Indices for Industrial Goods* (United Nations, 1979) over 25 years ago. The methods and procedures presented then are now outdated. Index number theory and practice and improvements in technology have advanced greatly over the past two decades.

B.1 Concerns with current index methods

The *PPI Manual* takes advantage of the wealth of recent research on index number theory. It recommends many new practices instead of just codifying existing statistical agency practices. There are a number of reasons for this.

First, the standard methodology for a typical PPI is based on a Laspeyres price index with fixed quantities from an earlier base period. The construction of this index can be thought of in terms of selecting a basket of goods and services representative of base-period revenues, valuing this at base-period prices, and then repricing the same basket at current-period prices. The target PPI in this case is defined to be the ratio of these two revenues. Practicing statisticians use this methodology because it has at least three practical advantages. It is easily explained to the public, it can use often expensive and untimely weighting information from the date of the last (or an even earlier) survey or administrative

source (rather than requiring sources of data for the current month), and it need not be revised if users accept the Laspeyres premise. One notable advantage of the Laspeyres approach under the ease of explanation heading is its consistency in aggregation. It produces various breakdowns or subaggregates related to one another in a particularly simple way.

Statistical agencies implement the Laspeyres index by putting it into price-relative (price change from the base period) and revenue-share (from the base period) format. In this form, the Laspeyres index can be written as the sum of base-period revenue shares of the items in the index times their corresponding price relatives. Unfortunately, simple as it may appear, there still are a number of practical problems with producing the Laspeyres index exactly. Consequently, statistical agency practice has introduced some approximations to the theoretical Laspeyres target.

- Until recently it has been impossible to get accurate revenue shares for the base period down to the finest level of commodity aggregation, so statistical agencies settle for getting base-period revenue weights at the level of 100 to 1,000 products.

- For each of the chosen product aggregates, agencies collect a sample of representative prices for specific transactions from establishments rather than attempting to enumerate every possible transaction. They use equally weighted (rather than revenue-weighted) index formulas to aggregate these elementary product prices into an elementary aggregate index, which will be used as the price relative for each of the 100 to 1,000 product groups in the final Laspeyres formula. Practitioners recognize that this two-stage procedure is not exactly consistent with the Laspeyres methodology (which requires weighting at each stage of aggregation). However, for a number of theoretical and practical reasons, practitioners judge that the resulting elementary index price relatives will be sufficiently accurate to insert into the Laspeyres formula at the final stage of aggregation.

The above standard index methodology dates back to the work of Mitchell (1927) and Knibbs (1924) and other pioneers who introduced it about 80 years ago, and it is still used today.

Although most statistical agencies have traditionally used the Laspeyres index as their *target index*, both economic and index number theory suggest that some other types of indices may be more appropriate target indices to aim for: namely, the Fisher, Walsh, or Törnqvist-Theil indices. As is well known, the Laspeyres index has an upward bias compared with these target indices. Of course, these target indices may not be achievable by a statistical agency, but it is necessary to have some sort of theoretical target to aim for. Having a target concept is also necessary, so that the index that is actually produced by a statistical agency can be evaluated to see how close it comes to the theoretical ideal. In the theoretical chapters of this *Manual*, it is noted that there are four main approaches to index number theory:

(1) Fixed-basket approaches and symmetric averages of fixed baskets (Chapter 15);
(2) The stochastic (statistical estimator) approach to index number theory (Chapter 16);
(3) Test (axiomatic) approaches (Chapter 16); and
(4) The economic approach (Chapter 17).

Approaches 3 and 4 will be familiar to many price statisticians and expert users of the PPI, but perhaps a few words about approaches 1 and 2 are in order.

The Laspeyres index is an example of a fixed-basket index. The concern from a theoretical point of view is that it has an equally valid "twin" for the two periods under consideration—the Paasche index, which uses quantity weights from the current period. If there are two equally valid estimators for the same concept, then statistical theory tells us to take the average of the two estimators in order to obtain a more accurate estimator. There is more than one way of taking an average, however, so the question

of the "best" average to take is not trivial. The *Manual* suggests that the "best" averages that emerge for fixed-base indices are the geometric mean of the Laspeyres and Paasche indices (Fisher ideal index) or the geometric average of the quantity weights in both periods (Walsh index). From the perspective of a statistical estimator, the "best" index number is the geometric average of the price relatives weighted by the average revenue share over the two periods (Törnqvist-Theil index).

There is one additional result from index number theory that should be mentioned here—the problem of defining the price and quantity of a product that should be used for each period in the index number formula. The problem is that the establishment may have sales for a particular product specification in the period under consideration at a number of different prices. So the question arises, what price would be most representative of the sales of this transaction for the period? The answer to this question is obviously the *unit value* for the transaction for the period, since this price will match up with the quantity sold during the period to give a product that is equal to the value of sales.[1]

Now consider concerns about the standard PPI methodology. There are *six main areas of concern* with the standard methodology:[2]

(1) At the final stage of aggregation, the standard PPI index is *not* a true Laspeyres index, since the revenue weights pertain to a reference base *year* that is different from the base *month* (or quarter) for prices. Thus the expenditure weights are chosen at an annual frequency, whereas the prices are collected at a monthly frequency. To be a true Laspeyres index, the base-period revenues should *coincide* with the reference period for the base prices. In practice, the actual index used by many statistical agencies at the last stage of aggregation has a weight reference period that precedes the base-price period. Indices of this type are likely to have some upward bias compared with a true Laspeyres index, especially if the expenditure weights are price-updated from the weight reference period to the Laspeyres base period. It follows that they must have definite upward biases compared with theoretical target indices such as the Fisher, Walsh, or Törnqvist-Theil indices.

(2) At the early stages of aggregation, unweighted averages of prices or price relatives are used. Until relatively recently, when enterprise data in electronic form have become more readily available, it was thought that the biases that might result from the use of unweighted indices were not particularly significant. However, recent evidence suggests that there is potential for significant upward bias at lower levels of aggregation compared with results that are generated by the preferred target indices mentioned above.

(3) The third major concern with the standard PPI methodology is that, although statistical agencies generally recognize that there is a problem with the treatment of quality change and new goods, it is difficult to work out a coherent methodology for these problems in the context of a fixed-base Laspeyres index. The most widely received good practice in quality-adjusting price indices is "hedonic regression," which characterizes the price of a product at any given time as a function of the characteristics it possesses relative to its near substitutes. In fact, there is a considerable amount of controversy on how to integrate hedonic regression methodology into the PPI's theoretical framework. The theoretical and practical chapters in the *Manual* devote a lot of attention to these methodological problems. The problems created by the disappearance of old goods and the appearance of new models are now much more severe than they were when the traditional PPI methodology was developed some 80 years ago (then, the problem was mostly ignored). For many categories of products, those priced at the beginning of the year are simply no longer available by the end of the year. Thus, there is a

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[1]Note that the *Manual* does *not* endorse taking unit values over *heterogeneous* items at this first stage of aggregation; it endorses only taking unit values over *identical* items in each period.

[2]These problems are not ranked in order of importance; they all seem equally important.

tremendous concern with *sample attrition*, which impacts on the overall methodology; that is, at lower levels of aggregation, it becomes necessary (at least in many product categories) to switch to chained indices rather than use fixed-base indices. Certain unweighted indices have substantial bias when chained.

(4) A fourth major area of concern is related to the first concern: the *treatment of seasonal commodities*. The use of an annual set of products or the use of annual revenue shares is justified to a certain extent if one is interested in the longer-run trend of price changes. If the focus, however, is on short-term, month-to-month changes (as is the focus of central banks), then it is obvious that the use of annual weights can lead to misleading signals from a short-run perspective, since monthly price changes for products that are out of season (i.e., the seasonal weights for the product class are small for the two months being considered) can be greatly magnified by the use of annual weights. The problem of seasonal weights is a big one when the products are not available at all at certain months of the year. There are solutions to these seasonality problems, but the solutions do not appeal to traditional PPI statisticians because they involve the construction of *two* indices: one for the short-term measurement of price changes and another (more accurate) longer-term index that is adjusted for seasonal influences.

(5) A fifth concern with standard PPI methodology is the general exclusion of services from the PPI framework. A typical PPI will include mining, manufacturing, electricity, gas supply, and water supply activities, normally referred to as an industrial PPI. Many countries may also include agricultural prices. Thus, PPI coverage includes many more goods-producing activities than services. In a way, this just reflects the historical origins of existing PPI theory. National PPIs have essentially been concerned with coverage of goods for 80 years, but 80 years ago goods were much more significant than services. Hence, there was not much focus on the problems involved in measuring services. It is only over the past 30 or so years that the shift to services has caused services output to exceed output of goods. In addition to inertia, there are some serious conceptual problems involved in measuring the prices of many services. Some examples of difficult-to-measure services are insurance, gambling, financial services, advertising services, telecommunication services (with complex plans), entertainment services, and trade. In many cases, statistical agencies simply do not have appropriate methodologies to deal with these difficult conceptual measurement problems. Thus, output prices for these service sector PPIs are not widely measured.[3]

(6) A final concern with existing PPI methodology is that it tends not to recognize that more than one PPI may be required to meet the needs of different users. There are three basic types of PPIs that users might want: *gross output* price indices, *intermediate input* price indices, and *value-added* price indices. Most countries concentrate on producing output price indices by product and industry, with little attention given to input price indices. Another example for multiple indices is gross output indices versus net sector indices. Aggregating industry or product gross output indices includes double-counting the effects of input price changes—the input price change effects are included in both the originating sector and the using sector indices. Net sector indices exclude interindustry price effects and are, therefore, a better gauge of the evolution of inflation through the production chain. In addition, some users may require information on the month-to-month movement of prices in a very timely fashion. This requirement leads to a fixed-weight PPI along the lines of existing PPIs, where current information on weights is not necessarily available. However, other users may be more interested in a

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[3]The Voorburg Group, which meets annually, has included the expansion of PPIs to services as part of its work program. The OECD, as part of its contribution to this program, conducts periodic surveys on the extension of PPIs in services activities. The latest survey results along with developments in services statistics are available at http://www.oecd.org/document/43/0,2340,en_2649_34355_2727403_1_1_1_1,00.html.

more accurate or representative measure of price change and may be willing to sacrifice time-liness for increased accuracy. Thus, statistical agencies might produce one of the theoretical target indices (e.g., Fisher, Walsh, or Törnqvist-Theil) that uses current- and base-period weight data with a delay of a year or two. These are entirely reasonable developments, recognizing that different users have different needs. Since all three approaches have strong support, it would be reasonable for a statistical agency to pick one approach for its flagship index but make available the other two treatments as "analytical series" for interested users. Another example where multiple indices would be useful occurs in the context of seasonal products. The usual PPI is a month-to-month index, and it is implicitly assumed that all products are available in each month. As noted in item (4) above, this assumption is not warranted. In this context, a month-to-month PPI will not be as "accurate" as a year-over-year PPI that compares the prices of products in this month with the corresponding products in the same month a year ago. Again, the need emerges for multiple indices to cater to the needs of different users.

Many of the above areas of concern are addressed in this *PPI Manual*. Frank discussions of these concerns should stimulate the interest of academic economists and statisticians to address these measurement problems and to provide new solutions that can be used by statistical agencies. Public awareness of these areas of concern should lead to a willingness on the part of governments to allocate additional resources to statistical agencies so that economic measurement will be improved. In particular, there is an urgent need to fill in some of the gaps that exist in the measurement of service sector outputs.

B.2   Efforts to address the concerns in index number methods

Several years ago it became clear that the outstanding and controversial methodological concerns related to price indices needed further investigation and analysis. An expert group consisting of specialists on price indices from national and international statistical offices and universities from around the world formed to discuss these concerns. It met for the first time in Ottawa in 1994. During six meetings between 1994 and 2001, the Ottawa Group presented and discussed over a hundred research papers on the theory and practice of price indices. While much of the research related to consumer price indices (CPIs), many of the issues carried across to PPIs. It became obvious there were ways to improve and strengthen existing PPI and CPI methods.

In addition, the Voorburg Group on Service Sector Statistics, with members from many national statistical offices, has held annual meetings for over a decade. Many agenda topics of the Voorburg Group related to expanding country PPIs to cover service industries and products. The Group has provided many technical papers on concepts and methods for compiling service PPIs. These papers serve as documentation that other countries can follow.

At the same time, the control of inflation had become a high-priority policy objective in most countries. Policymakers use both the CPI and PPI widely to measure and monitor inflation. The slowing down of inflation in many parts of the world in the 1990s, compared with the 1970s and 1980s, increased interest in PPI and CPI methods rather than reduce it. There was a heightened demand for more accurate, precise, and reliable measures of inflation. When the rate of inflation slows to only 2 or 3 percent each year, even a small error or bias becomes significant.

Recent concern over the accuracy of price indices led governments and research institutes in a few countries to commission experts to examine and evaluate the methods used, particularly for the CPI. The methods used to calculate CPIs and PPIs have been subject to public interest and scrutiny of a kind and level that were unknown in the past. One conclusion reached is that existing methods might lead to some upward bias in both the CPI and PPI. One reason for this was that many goods and services had inadequate allowance for improvements in their quality. The direction and extent of such bias will, of course, vary between commodity groups, and its total effect on the economy will vary

among countries. However, the upward bias has the potential to be large, so this *Manual* addresses adjusting prices for changes in quality in some detail, drawing on the most recent research in this area. There are other sources of bias including that arising from no allowance, or an inappropriate one, made for changes in the bundle of items produced, when production switches between commodities with different rates of price change. Further, different forms of bias might arise from the sampling and price collection systems. Several chapters deal with these subjects, with an overall summary of possible errors and biases given in Chapter 11.

CPIs are widely used for the index linking of social benefits such as pensions, unemployment benefits, and other government payments. The cumulative effects of even a small bias could have notable long-term financial outcomes for government budgets. Similarly, a major use of PPIs is as an escalator for price adjustments to long-term contracts. Agencies of government, especially ministries of finance, and private businesses have taken a renewed interest in price indices, examining their accuracy and reliability more closely and carefully than in the past.

In response to the various developments outlined above, the need to revise, update, and expand the UN manual was gradually recognized and accepted during the late 1990s. The joint UNECE/ILO meeting of national and international experts on CPIs held at the end of 1997 in Geneva made a formal recommendation to revise *Consumer Price Indices: An ILO Manual* (ILO, 1989). The main international organizations interested in measuring inflation have taken responsibility for the revision. The United Nations Statistical Commission in 1998 approved this strategy and agreed to set up the *Inter-secretariat Working Group on Price Statistics* (IWGPS).

C.   Organization of the Revision

C.1   Agencies responsible for the revision

The following international organizations—concerned with measuring inflation, with policies designed to control inflation, and with measurement of deflators for national accounts—have collaborated on revising the *CPI* and *PPI Manuals*:

- The International Labour Organization (ILO);
- The International Monetary Fund (IMF);
- The Organisation for Economic Co-operation and Development (OECD);
- The Statistical Office of the European Communities (Eurostat);
- The UN Economic Commission for Europe (UNECE); and
- The World Bank.

These organizations have provided, and continue to provide, technical assistance on CPIs and PPIs both to developing countries and to countries in transition from planned to market economies. They joined forces for the present revision of the *CPI* and *PPI Manuals*, setting up the IWGPS for this purpose. The group's role was to organize and manage the process rather than act as an expert group.

The responsibilities of the IWGPS were as follows:

- To appoint the various experts on price indices who shared in the revision either as members of the Technical Expert Group (who provided substantive advice on the contents of the *Manual*) or as authors of the various chapters;
- To provide the financial and other resources needed;
- To arrange meetings of the Technical Expert Group, prepare the agendas, and write the reports on the meetings; and
- To arrange for the publishing and disseminating of the two *Manuals*.

Members of the IWGPS were also members of the Technical Expert Groups. The experts taking part in the Technical Expert Groups were invited in their personal capacity as experts and not as representatives, or delegates, of the national statistical offices or other agencies that employed them. Participants were able to give their expert opinions without in any way committing the offices from which they might have come.

C.2   Links with the new *Consumer Price Index Manual*

One of the first decisions of the IWGPS was to produce a new international *PPI Manual* at the same time as the *CPI Manual*. There have been international standards for CPIs for over 70 years, but the UN's 1979 PPI manual was the first international manual on producer prices. Despite the importance of PPIs for measuring and analyzing inflation, the methods used for compiling them have been comparatively neglected, at both national and international levels.

The IWGPS set up two Technical Expert Groups, one for each *Manual*, whose membership overlapped. *The two manuals have similar contents and are fully consistent with each other conceptually, sharing common text when suitable.* The two groups worked in close liaison with each other. The PPI and CPI methods have a lot in common. Both use essentially the same underlying economic and statistical theory, except that the CPI draws on the economic theory of consumer behavior, whereas the PPI draws on the economic theory of production. However, the two economic theories are isomorphic and lead to the same kinds of conclusions about index number compilation. The *Manuals* have practical and operational applications (Chapters 1–13 and the Glossary) that are supported by their theoretical underpinnings (Chapters 14–22).

Most members of the Technical Expert Groups on CPIs and PPIs also engaged as active members of the Ottawa Group. The two *Manuals* were able to draw on the contents and conclusions of all the numerous papers presented at meetings of the Ottawa and Voorburg Groups.

D.   Acknowledgments

The *PPI Manual* is the result of a five-year process that involved multiple activities. The first activities were the development of the *Manual* outline and the recruitment of individuals to draft the various chapters. Next, members of the Technical Expert Group on the PPI (TEG-PPI), the IWGPS, and others refereed the draft chapters. Then came the posting of the draft chapters on a *PPI Manual* website for comment by interested individuals and organizations. The final steps were consultation with a focus group of selected users from national statistical offices. Final copyediting of the *Manual* was coordinated in the IMF External Relations Department by James McEuen. The editor wishes to thank Mbaye Gueye for assistance in the final review of the *Manual* and all of those involved in the process, with special recognition for the following:

- *The author, or authors, of the chapters (with their affiliations).*

Preface	Paul Armknecht (*PPI Manual* editor, IMF), W. Erwin Diewert (University of British Columbia), Peter Hill (*CPI Manual* editor, expert)
Reader's Guide	Paul Armknecht (IMF), Peter Hill (expert)
Chapter 1	Paul Armknecht (IMF), David Collins (Australian Bureau of Statistics), Peter Hill (expert)
Chapter 2	Andrew Allen (U.K. Office of National Statistics), Paul Armknecht (IMF), David Collins (Australian Bureau of Statistics)
Chapter 3	Paul Armknecht (IMF), Irwin Gerduk (U.S. Bureau of Labor Statistics)
Chapter 4	Paul Armknecht (IMF)

Chapter 5	Paul Armknecht (IMF), Fenella Maitland-Smith (OECD)
Chapter 6	Andrew Allen (U.K. Office of National Statistics), David Collins and Matthew Berger (Australian Bureau of Statistics)
Chapter 7	Mick Silver (Cardiff University)
Chapter 8	Mick Silver (Cardiff University)
Chapter 9	Carsten B. Hansen (Denmark Central Bureau of Statistics), Peter Hill (expert), Robin Lowe (Statistics Canada), Mick Silver (Cardiff University)
Chapter 10	Dennis Fixler (editor, U.S. Bureau of Economic Analysis); contributions from Australian Bureau of Statistics, Statistics Canada, Statistics Singapore, and U.S. Bureau of Labor Statistics
Chapter 11	Mick Silver (Cardiff University)
Chapter 12	David Fenwick (U.K. Office of National Statistics), Yoel Finkel (Israel Central Bureau of Statistics)
Chapter 13	Paul Armknecht (IMF), Tom Griffin (expert)
Chapter 14	Kimberly Zieschang (IMF)
Chapter 15	W. Erwin Diewert (University of British Columbia), Paul Armknecht (IMF)
Chapter 16	W. Erwin Diewert (University of British Columbia)
Chapter 17	W. Erwin Diewert (University of British Columbia)
Chapter 18	W. Erwin Diewert (University of British Columbia)
Chapter 19	W. Erwin Diewert (University of British Columbia)
Chapter 20	W. Erwin Diewert (University of British Columbia), Mick Silver (Cardiff University)
Chapter 21	Mick Silver (Cardiff University), W. Erwin Diewert (University of British Columbia)
Chapter 22	W. Erwin Diewert (University of British Columbia), Paul Armknecht (IMF)
Glossary	David Roberts (OECD), Paul Schreyer (OECD)
Glossary Appendix	Bert Balk (Statistics Netherlands, Appendix).

- *The individual members of the IWGPS and the TEG-PPI.*

IWGPS: Organizational membership is as follows: Eurostat, ILO, IMF, OECD, UNECE, and World Bank. During the revision of the *Manual*, the *CPI Manual* editor (Peter Hill), TEG-CPI chairperson (David Fenwick), and *PPI Manual* editor and TEG-PPI chairperson (Paul Armknecht) were observers. The ILO was the Secretariat for the Group, and Sylvester Young the chairperson of the IWGPS.

The IWGPS met formally four times: September 24, 1998 (Paris), February 11, 1999 (Geneva), November 2, 1999 (Geneva), and March 21–22, 2002 (London). Informal meetings were held on several occasions.

TEG-PPI: Andrew Allen (U.K. Office of National Statistics), Paul Armknecht (chair, IMF), Bert Balk (Statistics Netherlands), Matthew Berger* (Australian Bureau of Statistics), David Collins* (Australian Bureau of Statistics), W. Erwin Diewert (University of British Columbia), Yoel Finkel (Israel Central Bureau of Statistics), Dennis Fixler (U.S. Bureau of Economic Analysis), Irwin Gerduk (U.S. Bureau of Labor Statistics), Jan Karlsson (UNECE), Robin Lowe (Statistics Canada), Richard McKenzie* (Australian Bureau of Statistics), David Roberts (OECD), Paul Schreyer (OECD), Mick Silver (Cardiff University), and Kimberly Zieschang (IMF). The IMF was the Secretariat for the Group.

The TEG-PPI met five times: November 2–3, 1999 (Geneva), September 20–22, 2000 (Madrid), October 29–30, 2001 (Geneva), March 19–21, 2002 (London), and February 25–27, 2003 (Washington, D.C.).[4]

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[4]Individuals with an asterisk (*) after their name served for only part of the period.

- *The participants of a focus group seminar on the* PPI Manual *in Pretoria, South Africa.*