

7. Price Collection

A. Introduction

7.1 This chapter gives an overview of price collection issues. The focus of the chapter is on price collection for the survey pricing approach to XMPIs. In Chapter 5 two sources of data for XMPIs were considered: administrative sources and survey sources. The former relies on established data collection procedures, primarily customs data *The design and implementation of such administrative data collection procedures are, to a large extent, not dictated by the needs of XMPI index number construction and thus not the concern of this chapter.* In Chapter 2, consideration was given to circumstances under which administrative sources might prove unreliable for tracking prices, and price surveys may be more fruitfully employed. *Further sources of data, used for import price indices, are series of world market prices and mirror prices from other countries. Again these series are collected by other organizations for other purposes, and not the direct concern of this chapter.*

7.2 It should be reiterated that the establishments to be surveyed will include those that specialize in the distributive export and import trade, as well as producers in manufacturing, mining, energy and other non-distributive industries that export their output and import their inputs. There may well be a program of price surveys of resident establishments for the PPI, possibly for intermediate inputs and outputs. Price collection for XMPIs should be integrated into the PPI surveys so as to first, enhance the comparability of the PPI and XMPIs, second, not unnecessarily increase the number of responding establishments, third, to take advantage of trained price collectors, computer and administrative systems, and finally, not waste resources on duplication which might otherwise be utilized in improving the quality of the resulting data. The prices collected for the PPI is unlikely to be sufficient for XMPIs and additional establishments will be required to be sampled and prices for some of the responding establishments will have to be collected for both the domestic and foreign markets. Not all issues relating to price collection will be considered in this chapter. Chapter 13 on the organization and management of the XMPI also provides guidance on price collection within the framework of the whole XMPI system.

7.3 This chapter describes a range of options for each aspect of price collection, but is not prescriptive, since different solutions can be used depending on individual country circumstances. Price collection is a vital part of the overall XMPI compilation process. Without good quality price collection procedures it is difficult or impossible to produce accurate and reliable results, regardless of how rigorous the subsequent processing is throughout the remaining steps of producing the XMPI.

B. Timing and Frequency of Price Collection

7.4 Calculating the XMPI entails collecting prices from businesses relating to particular commodities and time periods. Businesses can be both exporters and importers of commodities, so that prices may be collected for sales of goods and services for use in an export price index or purchases of goods and services for use in an import price index. Both

indices serve useful purposes as macro-economic indicators, as well as being of use as deflators.

7.5 The frequency of collection is commonly monthly, although a number of countries operate a quarterly collection system. For the purposes of this chapter, it is assumed that price collection is monthly which is the most common practice. When collecting prices for a particular period, there are two basic choices of collection period: point-in-time or period averages.

B.1 Point-in-time prices

7.6 Point-in-time prices relate to the price of a commodity on a particular date in the month. For example, first day, first Monday, the nearest trading day to the 15th of the month, etc. This approach makes the collection date straightforward, and it should be well understood by the business establishment that prices provided relate to transactions on that date.

7.7 The main advantage of point-in-time pricing is that comparisons from month to month will be consistent, which is particularly important when there are step changes in prices taking place during the month such as a general price increase or duty changes. One of the disadvantages of a set point in time for XMPs is that a transaction may not have taken place on the specified date. If this happens, respondents can be asked to provide details of a transaction that occurred as near as possible to the specified date. Another problem is that point-in-time estimates are more susceptible to short-term external influences (for example, extreme weather, labor stoppages) that could affect the price on the particular day of price collection. They may also miss short-term price changes (for example, rise and fall) that occur between pricing dates.

B.2 Period prices

7.8 Period prices are an estimate of the price across the month and so are average prices for the month. A period price should take account of when price changes occurred during the month. For example, if a commodity was priced at 10 for the first 10 days of a month, and then increased to 15 for the remaining 20 days, then the average price would be 13.33 (that is, $[10 \times 10 + 20 \times 15] / 30$). This averaging is usually done by the statistical office and requires the exact date of the price change to be supplied by the respondent.

7.9 This approach usually yields a smoother time series and is less susceptible to the vagrancies of the timing of price increases. The method is also easier for respondents since they can select a transaction and specify the relevant transaction date within the period. A key feature (compared to point-in-time estimation) with this method is that where a price changes partly through the month, the full effect of the price change is not included in the index until the following month. This is appropriate for an index used for deflation purposes as well as for an inflation measure.

7.10 Often a single price quotation is taken to represent the average price over the particular reference period. In theory, a more accurate measure of an average transaction

price is the *unit value price*. Also in theory, unit value prices, which are total sales divided by the total number of units sold in a period, are the most complete method of pricing.

7.11 If this method is used, the commodity must be either homogeneous or able to be expressed in terms of some common physical unit. A homogeneous commodity can be distinguished by

- its point of purchase (outlet effect),
- the various competing brands or commodity lines of the commodity being sold at an outlet (brand effect), or
- the various package sizes at which the commodity is sold (packaging effect), and
- any other price-determining characteristics (quality effect)
- country of destination/origin (see Ruffles and Williamson, 1997).

7.12 For a strictly homogeneous goods unit values are appropriate for aggregation over time. If, for example, the price over a month of the very same item is higher in the latter weeks than the former the unit value for the month would be an appropriately quantity weighted average price—it solves the time aggregation problem (Chapter 21, Section B).

7.13 Unfortunately, the use of changes in unit values over time as a surrogate for price changes is very problematic and is not generally recommended, since any change in commodity quality, commodity mix can seriously distort the average unit price, as demonstrated in Ruffles and Williamson (1997). In limited circumstances—for example, for a highly volatile but narrowly defined and homogeneous commodity like petroleum—this method can be used.

7.14 Care must be taken to ensure that the average prices relate to a narrowly defined commodity of constant quality, rather than a broad commodity group. Furthermore, an index will be less timely using period prices, when compared with point-in-time estimates, since the average cannot be calculated until the end of the period.

7.15 Transportation costs should be excluded from the unit value calculation for export price indices because the pricing basis is the *basic price*—that is, the amount received by the producer, or distributor exclusive of any taxes on commodities and transport and trade margins. In other words, the pricing point is ex-factory, ex-wholesaler, ex-farm, and so on.

B.3 Choice of point-in-time or period prices

7.16 The choice of collection period is influenced by a number of issues such as the frequency of collection, the practicalities of price collection, and the uses of the index. The choice of collection method becomes less important the more frequent the collection; thus the choice is more important for quarterly collection than monthly collection, although it is still an important consideration for monthly collection. The use of the index is an important consideration. Since XMPs are used to deflate trade values, ideally the index should relate to

the time period of the trade flows. Most economic statistics relate to a period rather than a point in time so again, in principle, the price index should do the same. It may be that for particular (homogeneous) commodities unit values are used while point-in-time prices are used in other instances.

B.4 Frequency

7.17 A distinction can be made between the frequency of collection and timing of observations. Monthly prices can be observed, for example, quarterly. The choice of collection frequency is determined by issues such as costs and the periodicity needed for deflation of output or sales data. In the EU, members are required to provide monthly data to the Statistical Office of the European Communities (Eurostat) under the short-term indicators regulation. Normally, prices will be collected from every business in the sample for each time period.

7.18 While collecting prices for every period is appropriate for most industries, there may be industries where prices are generally stable, commodities take a long time to produce, or they change at predetermined times, for example each January. Collecting a price every period in such a situation may be an unnecessary burden on businesses. For respondents in these industries, a price for each period is still required although it may be possible to reduce the periodicity of collection; this is a case where using ‘carry forward’ price imputation is desirable. In some exceptional circumstances, respondents may be allowed to give forward prices, but care must be taken to avoid complacency. In these cases, usually involving long-term contracts, respondents can make a commitment that the price will not change in the defined forward period. If this turns out to be incorrect, the frequency of reporting should be changed. Annex 7.3 provides an example of a form used for price collection which makes provision for the inclusion of future prices.

B.5 Definition of a price observation

7.19 Chapter 6 on sampling explained how a representative sample of commodities should be selected. This section describes how prices for these selected commodities should be determined and collected. A price observation can be defined as the price of a specific commodity at the point in time or for the period of price collection and its terms of sale. To ensure consistency in the final index, the price observation should compare like with like for each period. The commodity should be defined as tightly as possible so that the returned price is consistent from period to period and changes in quality can be identified (see Chapter 8.B). The price should be one that a customer has paid for the specified commodity and include all available discounts and special offers—that is, a real transaction price. (See section D.4.1 below.)

7.20 If the commodity specification changes from one period to another, the price needs to be adjusted to ensure consistency. For instance, the quantity per order may increase, resulting in a lower unit-selling price. If the new quantity sold was available at the same unit price last period as it is this period, this is *not* a genuine price decrease and should not be reflected in the index. Rather, the comparison should be made between the same quantity

purchased in both periods so that the index compares the same specifications (that is, like with like).

7.21 Care should be taken to ensure the currency of the returned price is clearly denoted, so that prices over time in different currencies are not compared. This is particularly important when respondents are providing price information for sales to both the domestic and export market. Procedures should be in place to convert all returned prices to home currency values. However, it must be clear what coverage is intended, either production for the home market or for the home and export market so that the price quotations can be used for the appropriate indices. The data supplied by the contributor should be in the currency in which the transaction took place; then the currency conversion, undertaken in the national statistical office, should ideally follow the principles in the *SNA 93*, and be at the midpoint between the buying and selling rate. The midpoint rate is used to exclude any service charge. The conversion should be at the rate prevailing at the time the transaction takes place, which may differ from the time the payment is made. In practice some rule may be used such as using mid-month exchange rates.

B.5.1 List prices

7.22 The aim of compilers of XMPIs is to measure *actual* prices paid to or received from producers for goods or services. These are commonly referred to as transaction prices. By definition, these prices include all discounts or rebates given.

7.23 The price of goods or services as quoted in a catalogue or advertisement is often referred to as the list price, book price, or recommended retail price. These prices are typically higher than transaction prices, as discounts or rebates apply to transaction prices.

7.24 In most areas of the economy, the prices actually paid or received for goods or services are not the list prices. Typically, negotiations between the producer and purchaser result in some form of discount or rebate, particularly to large purchasers. In most cases they are substantial reductions off the list price and will vary over time. XMPIs compilers should ensure that actual transaction prices are obtained rather than list prices.

7.25 It is usually easier for a respondent to provide a list price rather than a transaction price. For the reasons already stated, this is not appropriate. Because it is difficult to price a transaction, to achieve constant quality, compilers should ensure that the commodity priced is the same as that priced in the previous period.

B.6 Issues for high/hyper inflation

7.26 During periods of high or hyperinflation, the timing of price collection takes on significant importance. Prices may well change substantially during the collection period.

7.27 The frequency of collection also becomes more important, so quarterly collection may be inadequate for policy makers in a hyper inflationary period. Even in times of low inflation, it is important that early signals of upstream inflationary pressure are captured. Validation of the data may also prove to be more difficult as it is likely that every price quote

would fail validation checks set during “normal” inflation, and it would be more difficult to spot erroneous returns.

7.28 On a wider scale, there is also a potential problem of feedback or circularity fuelling inflation. Some companies may use the export or import price index to fix their prices (as part of a contract with the customer), which could then feed into the calculation of future such indices (there is always a risk of this in detailed indices, but the risk would be higher in periods of very high inflation).

C. Commodity Specification

7.29 The XMPI price collection surveys are unusual compared to most business surveys since, as with the PPI survey, there is a requirement to get a detailed commodity specification from respondents before the routine monthly collection can begin; this process is often called initialization or recruitment.

7.30 A separate set of processes and survey forms are required for the initialization procedure. The collection method used can also be different for the initialization period—for example, it may be possible and desirable to make a personal visit to each new respondent at initialization, but subsequent routine price collection would be done via postal collection. The initialization form should put more emphasis on explaining the purpose of the survey and contain more details about the commodity specification requirements. This form should also contain a commodity list for the respondent to identify which commodities they produce from the list. The initialization process may also be conducted by specialist staff such as field officers (see section D.6). Annex 7.1 provides, as an example, a form used by the U.K. Office for National Statistics (ONS) for the recruitment of items from an establishment for price collection (ONS, 2000). The following section on commodity specification can apply to both the initialization process and routine collection procedures.

C.1 Purpose of commodity specification.

7.31 For each commodity group or service, prices for a set of specific representative commodities need to be fully specified for pricing. These commodities should be typical of the price movements of the range of individual commodities within the commodity group or service under consideration. The selection of commodities from within the commodity range of each establishment would ideally be undertaken from a complete census of the relevant transactions. Obviously in most cases this information is not available. In some cases there can be a trade-off between having infrequent data on a more complete and detailed basis, and more frequent product-updating procedures which rely on the respondents to the price collection to self select commodities which are representative of their transactions and, hence, the commodity group. The sample selection aspects of commodity selection were covered in Chapter 6.

C.2 Aspects of commodity specification

7.32 There are a number of different aspects of commodity specification. For example, simply giving a commodity name will not be sufficient if the size of the package changes,

which would, in turn, affect the price received. The essential purpose of a good commodity specification is to ensure that a consistent price is collected from period to period, relating to a consistent commodity with the same terms of sale in each period. The following table lists the main criteria that could affect the price of a commodity and could form part of a specification.

Item	Criteria / reason
Commodity name	Company's name for the commodity within the specified commodity group. This should ideally contain information on the model/variety of the product.
Serial number	For the company's reference. This allows for changes in commodity name.
Description	In addition to the commodity name, this gives an opportunity for the company to specify what (if any) enhancements or add-ons are included in the product. For example, with cars, there are usually a number of options available (metallic paint, sunroof) all of which could affect the price of the product. All important price-determining characteristics should be included not only to ensure that like is compared with like in each month, but also to detect the precise nature of any quality changes so that price adjustments can be undertaken (Chapter 8).
Size of transaction	The amount of the commodity sold in the transaction, and whether volume discounts apply.
Units of sale	Units used in describing the product.
Class of customer	Some companies may have different pricing structures for different customers (for example, retail and trade). A reference number can be used to maintain customer confidentiality.
Discounts	Many companies offer trade, volume, competitive, or preferred customer discounts. All applicable discounts should be described.
Payment terms	Companies may have different prices for different payment or credit terms.
Carriage terms	Whether transport costs are included and what type of transport.
Currency	Currency the price will be provided in.
Destination	Companies often charge different prices for different markets

7.33 It is useful to supply notes on the completion of the form; an example of such notes on item specification from the UK Office for National Statistics' survey is included as Annex 7.2 (ONS, 2000). Note that in 7.1 and 7.2 separate information is required on EU and non-EU trade. Different countries may require similar such breakdowns depending on the analytical needs of their central banks and customs unions. The above details combine to give a tighter specification for the commodity than just the description alone. Specifying a commodity in this way also supports the adjustment of the price associated with any changes in the commodity quality or the terms and conditions of sale. Some respondents object to

providing full specification details because of concerns about confidentiality, and in these cases the specification can be held in detail by the statistical office, but a shorter encoded specification can be used on printed material such as forms. If this is done, it is essential to review the specification regularly.

C.3 Other forms of description

7.34 For some industries, a specification for a particular commodity may not be appropriate. For example, some industries produce goods or services on a made-to-order basis, and the same commodity is not produced in successive periods. Examples of this could be furniture manufacturers, shipbuilders, and accounting services. In these instances, a generic specification may be more appropriate. This would be a specification, as described previously, but for a standard product, rather than for a specific product. This could be a commodity that the company has made at some point in the past, or a basic model that it customizes individually for each customer. See section D.5.2 below for more details on this type of pricing.

D. Collection Procedures

D.1 Survey collection techniques

7.35 The aim of all survey collection techniques is to facilitate the transmission of price data from businesses to the statistical office in a secure and cost-effective manner, while minimizing the administrative burden on the respondent. A range of approaches to XMPI data collection are discussed below—postal survey, automated telephone response, personal interview, telephone interview, and internet data provision. All of these methods rely on good questionnaire design, good respondent relations, and/or good interviewing techniques. Also, the highly sensitive and confidential nature of the price data provided by businesses may necessitate extra security requirements in data collection and processing.

D.2 Questionnaire design

7.36 Regardless of which data collection method is used good questionnaire design is essential for the successful collection of prices. The questionnaire should be designed to make it easy for the producer to use and understand what is required.

7.37 The layout should easily facilitate the extraction of data and should contain detailed descriptions of the commodities to be priced. Detailed descriptions not only help the producer but also help in validation and the identification of quality changes. Quality adjustments cannot be made in the absence of detailed commodity specifications (see Chapter 8 for more details on quality adjustment techniques). Detailed commodity descriptions also ensure that the same commodities are priced each month, which gives important continuity and enables the statistical office to validate the data.

7.38 The questionnaire should be designed to help the respondent to extract information quickly and to enable speedy and accurate processing in the office. To meet these objectives the questionnaire should:

- provide clear instructions on what the respondent is required to do;
- define why the establishment has been chosen, what the survey is and how the data are collated and published;
- enable respondents to complete the form quickly and accurately ;
- ensure supporting notes are available for each item of data to be collected;
- use plain and clear language;
- clearly identify the organization from which the survey has been sent and give a contact point and telephone number so respondents can get in touch to resolve any problems;
- request reasons for price changes; and
- ask whether the commodities are still representative and sold in volume.

7.39 Different designs can be used to make the questionnaire easier to complete for certain classes of respondents. For example, different designs could be used for different industry questionnaires. Also, a questionnaire with a checklist design that provides all the important specifications and price-determining characteristics will help respondents and data collectors. They will be able to verify the transaction and provide any new specifications or changes to the price basis that may apply when a previous transaction is no longer available and a replacement is selected.

7.40 One way to make the form easier to complete for businesses is to put the last recorded price on the questionnaire using a "tailored form" with unique commodity descriptions for each respondent. This will require the statistical agency to have much better form design and printing capabilities. It is controversial in terms of the impact on the results, however; while it is easier for the producer to complete, there is a greater risk that less care is taken in the completion of the survey, and the producer is more likely to repeat the last period's price even if a price change has taken place. There is also the risk that confidentiality will be breached if the form goes astray or even to the wrong part of the organization.

7.41 For help in validation and to reduce re-contact with the producer, it is useful to provide a space for 'comments' to allow the respondent to explain any unusual movements in their prices. It is also important to emphasize to the respondent that any change in specification must be reported. An example of a XMPI postal survey price collection form (ONS, 2000) that takes many of these issues into consideration is provided in Annex 7.3, though such questionnaires should, where necessary, be tailored to individual country circumstances. Note that the form in Annex 7.1 is used for initialization, after discussion with the respondent to provide information on the selected, representative product(s). The form in Annex 7.3 is used for the regular monthly price collection for the initialized commodities.

D.3 Medium of Collection

7.42 The following section outlines a range of survey collection methods. The principles of questionnaire design outlined above apply to each of these methods.

D.3.1 Self completion - Return of data by postal survey

7.43 Key points of good practice that should be followed in questionnaire design are outlined below.

- The form should be clearly addressed to the company in question. It should display on the front page the name of the institution from which it has been dispatched;
- Explain why it has been sent, how the results will be used and from whom the end commodity can be obtained;
- Include the name and number of the direct contact in the office, should respondents require assistance in completing the return; and
- Include any statutory obligations that respondents are under to complete the form and the penalties for not doing so.

7.44 Within the form, sufficient descriptions and explanations should be included for the respondent to follow, including.

- Guidance notes for each section requiring data,
- Clear definition of the commodity requiring data,
- The time period or point in time to be covered by the return,
- Instructions on how to change the description of the product,
- Information on linking the commodity description to industry tariff codes, and
- A period of back prices for amendment if necessary.

7.45 Allow for changes to administrative information on the form, including

- Space to record comments;
- The name and contact number of the person completing the form;
- Changes to the mailing address of the company, and
- Notes on how to return the form (prepaid envelope).

7.46 The main advantage of the postal survey approach is that it is inexpensive, particularly when coupled with modern data-handling technology, which reduces the need for operators to physically type data into systems. Large and dispersed geographical areas can be covered for minimum extra cost. This requires, of course, that the postal system in the country be accurate and dependable with deliveries.

7.47 Disadvantages of the postal survey approach include the difficulty in achieving a high level of response from respondents because the collection mode is not interactive. This can be mitigated if there is legislation in place to penalize for non-response. Potential quality problems can arise when respondents do not pay adequate attention to the notes and complete

the form incorrectly. For this reason, it is wise to explain the requirement through a meeting or telephone conversation when the respondent is originally selected to participate in the survey; personal contact with the respondent, even by phone, should be encouraged as a general method for improving the quality of data returns. An automated system of reminder letters may be set up which includes letters explaining the usefulness of the data and importance of maintaining response from the current randomly selected sample. The reminder letters might be supplemented by telephone calls. Nonresponse follow-up contacts and resolving queries about reported data can add a significant cost to the postal approach.

D.3.2 Automated Telephone Data Submission

7.48 Usually the XMPI price surveys collect price details for a small number of commodities from each respondent. The brevity of the questionnaire makes the XMPI surveys ideal for telephone-based data entry systems, in which the respondent reports the information directly over the telephone by following voice prompts and entering data using a touch-tone telephone. The pre-recorded dialogues in such systems enable the respondent to report their monthly data quickly and accurately. Usually a letter is dispatched asking the respondent to make a telephone return. This approach has the advantage that it is possible to program the dialogue to allow validation of the data to take place during the telephone call. This can be done by asking the respondent to leave a voice message or by switching the call to a data collection analyst. Generally, this method is mainly beneficial to the statistical office by reducing desk processing, and hence reducing costs. Some on-line validation can take place that may benefit respondents by saving them from being re-contacted by the statistical office.

7.49 The possible disadvantages of this system are confusion to some users caused by the technology and, because respondents can leave a voice message without discussion, some further clarification contact may be needed. This method is also less useful when there are complex commodity specifications, which need to be updated frequently. Annex 6.4 provides a flow chart for an automated telephone data entry system.

D.3.3 Personal interviewer

7.50 This involves a face-to-face meeting with each respondent on a regular basis (for example, monthly, quarterly) by a trained interviewer to obtain the data necessary for the survey. The main advantage of this approach is that the data can be validated at the source and problems and differences of understanding can be resolved during the discussion.

7.51 However, the big disadvantage is the cost of employing interviewers and the large travel costs, particularly where large distances are involved. There is also a disadvantage to the respondent, who would have to spend more time in face-to-face meetings with statistical office representatives. Field collection for the XMPI is not as viable as for the CPI because:

- Outlets are not clustered in population centers—often in decentralized industrial areas; and
- Inspection of commodities cannot be carried out, leading to less quality control of specifications.

7.52 A further variation here is to use another collection method (for example, postal questionnaire) on a regular basis and have a less frequent personal interview to clarify details such as the commodity range and representatively. For example, some statistical offices visit each respondent on a rotating basis over a 5-year period. This also gives the statistical office the chance to ‘train’ the respondent to provide good quality data. This approach can be particularly beneficial if used at the point where the business is initially brought into the sample, since many of the problems can be dealt with in a face-to-face meeting.

D.3.4 Telephone interviews

7.53 Each respondent would be called during the collection period and asked for the data required for the survey, with the interviewer validating the form when speaking to the respondent. The data collection staff can be assisted with a set dialogue or through computer-aided telephone interviewing. It is important that adequate training is provided to deal with questions that arise during the call. The main advantage of this approach is the data validation during the telephone call, but again, this is costly in terms of staffing and there can be difficulty getting through to the respondent to get the information. Telephone interviewing is becoming more difficult with technical developments that allow respondents to only answer telephone calls from selected people (via voicemail). Also, the respondent may not have the data immediately at hand, which could lead to guesses being provided rather than the correct data. The main concern with this method is that it is likely to lead to bias caused by respondents repeating previous observations, that is, stating that there has been no change.

D.3.5 Internet Data Provision

7.54 This is a method of data collection, which offers great potential in terms of efficiency and economy. Respondents can be given the questionnaire and reminded to respond through this channel. Systems to validate the data in real time as the data are being entered by the respondent are also possible. This is a benefit to the business respondent since it reduces re-contact time (although the benefits of a one-to-one dialogue are lost compared with other methods). Since the returned data are in electronic format, it is efficient for further processing by the statistical agency and the response times are quicker than postal-based collection.

7.55 There are, however, a number of issues related to Internet collection. To be effective a very large proportion of the businesses in the country must have access to the Internet. Also, Internet security is vital given the commercially sensitive nature of the data.

D.3.6 Electronic capture of data from Disc

7.56 This method involves the supply of a floppy disc containing an “electronic questionnaire.” The respondent loads the disc and completes the information before returning the disc to the statistical office. Data are then transferred to the statistical office database. This method allows on-line validation techniques to be built into the questionnaire to save re-contact time. However, the procedures for dealing with floppy discs are onerous and for short surveys such as the XMPI (with few data items to be collected) the benefits are limited.

D.3.7 Electronic Data Transfer

7.57 This method of collection involves the transfer of data files directly from the establishment's systems and allows a large volume of data to be collected with a minimum ongoing collection burden to the respondent. The initial set up procedures can be quite burdensome, but then the regular collection costs are reduced. The statistical office has to clearly define the data format and information system protocols. It is possible that this type of collection could allow full unit value data to be collected, which can be beneficial for tightly defined and homogenous commodities.

D3.8 Email collection

7.58 The use of e-mail is another collection method, which allows the survey form to be delivered and returned electronically. This approach is less efficient than some of the other electronic methods outlined above; however, it could be useful where postal services are less reliable. It is also useful as a reminder technique, since it offers speedy contact with respondents. Again, security is a key issue and, since e-mail can be less secure than some of the other forms of electronic collection, the legal issues should be examined carefully.

D3.9 Alternative Sources

Published sources

7.59 Some data items are available from public sources such as trade publications. Examples include metal prices for metals that are traded on financial markets, which are reported in the financial press and international journals such as *Metal Bulletin*. Published sources provide a high-quality source of price data for these commodities. Their advantage is that they are readily available and relatively inexpensive; they also reduce the respondent burden. Before using published source data the statistical office must be sure that the source is reliable and that the prices reported are genuinely independent market prices. It is important to verify that the prices are actually based on business transactions of these commodities. It is also a good idea to become as familiar as possible about the methodology used by the compiling organization.

7.60 A further subset of published sources that is becoming increasingly important is data collection from company websites. Many companies create extensive websites allowing customers to search by commodity specification and in some cases allowing customers to set their own commodity configuration. It is then possible to buy the commodity directly from the site. This type of website offers tremendous potential for XMPI price collection and also for independent validation of prices received through the more conventional channels. There are a few issues to consider, such as the extent to which the Internet prices are list prices instead of transaction prices and whether large buyers attract lower negotiated prices under long-term contract, for example.

7.61 Another important issue is that the Internet advertised prices may be retail prices. But in some circumstances retail and producer prices are the same. For example, one of the best sectors to use Internet advertising for price collection/validation is personal computers (PCs). In this case major manufacturers have set up websites which enable the public and

businesses to buy directly from the manufacturer (again it is important to be aware that bulk discounts could be offered).

7.62 It is worth noting that even if published sources are not used as direct inputs to the compilation of the index, they can provide valuable information for editing, external verification, and the preparation of analyses of the main index movements.

Regulatory Data Sources

7.63 For some commodities or services it is possible to get data from government regulators. It can be difficult to get access to this information if confidentiality constraints apply, but where it is possible to get this type of data, it can be of very high quality. Telecommunication and rail fare data are two examples of service prices collected in this way in several countries. The potential overlap between retail or producer price can also be an issue when using this type of data, but in many cases there are different tariffs for business and consumer use.

D.4 Field Procedures

The following section outlines practical field practices adopted by many statistical offices.

D.4.1 Price Discounts

7.64 Prices collected should be transaction prices, not list prices. This means that all discounts should be taken into account. Discounts can be given for a variety of reasons, such as prompt payment, volume of the purchase, competitive price-cutting, and so on. It is important that this is made clear during the survey collection process. Discounts arising from high volume transactions can cause particular difficulty. Problems occur if the volume sold to the representative customer changes from period to period, which could lead to changes in the discount rate in each period. In such a case the price index would move simply because of change in the volume mix, rather than as a result of a pure price change. This type of problem commonly occurs in quarry commodities, such as road stone and railway ballast. A possible approach in such circumstances is to seek prices for the same specific, typical transaction volume each month.

7.65 A common form of discounting is to provide a larger quantity of the commodity for the same price, sometimes for a limited period. The commodity specification should include details on quantity to enable an adjustment to be made to include this type of discount. Retrospective discounts based on sales volumes are an important feature of the manufacturing sector, but are difficult to collect with normal survey techniques, so these tend not to be included. An example is the bonus paid to car dealers by manufacturers based on sales volumes, which is separate from the original sales transaction.

D.4.1.1 Rebates

7.66 Rebates are a form of discount where the discount is (generally) paid after the purchase and are normally based on the cumulative value of purchases over a specified

time—for example, a rebate is given at the end of the year based on the customer's total purchases over that year.

7.67 The collection of discounted prices and the identification of discounts are complicated in practice by a number of factors. First, the pricing structure used by the company may be complex and the conditions under which discounts apply may be described in nonstandard terms. Second, differences in pricing and discounting procedures among companies require that data collection be tailored to each company. Third, in a number of areas, the level of discounts and rebates is commercially very sensitive information, and senior company officials may know only the full level of discounts offered to major customers. Taken together, these three factors mean that identifying and keeping track of discounts constitute the major tasks facing XMPI compilers.

7.68 Rebates in XMPI indices pose major practical problems in that they are often determined by future events—for example, the buyer receives a rebate at the end of the year on the basis of how much he or she purchased during the year. Thus, at the start of the year, although it is known that the buyer will receive a rebate, the precise amount is unknown. The special problem posed by rebates of this sort is that the final price to be paid may not be known until the end of the period concerned, when the total value of purchases will be known and hence the level of rebate can be calculated. This type is often referred to as a retrospective price fall.

7.69 Often a rebate paid to the buyer in the form of a reduction in the cost of the purchase over a year occurs in a particular month. This can lead to reported prices showing dramatic price falls for that particular period. XMPI compilers should take care to ensure this does not occur.

D.4.1.2 Treatment of rebates in XMPIs

7.70 The question arises as to how such rebates should be treated. Should the price paid each month be shown in the index as the price for the item? If so, how should the rebate be treated—as a retrospective price reduction? If so, should the previous prices be revised?

7.71 On balance it is considered that where the rebate is already in existence, the rebate should be treated as a discount and deducted from the monthly price and not treated as a retrospective price reduction. The basis for calculating the rebate should be the buyer's normal volume of purchases (if the buyer is a new customer, then the basis for calculating the rebate should be the average quantity purchased by that category of buyer).

7.72 Changes in the level of rebates should be reflected only when the actual rebate for the same quantity purchased or sold changes. Changes in the rebates paid to a particular customer for changing the volume of purchases should not be reflected as a price change.

7.73 As price indices are designed to measure price changes for a constant quantum of purchases or sales, the rebate collected should be the rebate applicable to that constant quantity and clearly specified in the pricing basis.

7.74 Where rebates are specified in terms of a monetary value of purchases or sales, it is important to realize that because of inflation a monetary value does not represent a constant real quantum. As a consequence, the monetary value should, if possible, be converted to a quantity. If this is not possible, then the dollar value should be updated each year according to the change in the price of the item concerned.

7.75 If the quantity or value of a respondent's purchases or sales changes significantly, the pricing basis should be changed to reflect this. The change in rebate associated with this should not be allowed to affect the index.

7.76 Where a number of levels of rebates are offered, it is necessary to ascertain the importance of each level of rebate and to price those that are significant.

7.77 Caution must be adopted when dealing with retrospective price falls. Revisions to previously published indices can create major problems for users, who use them to negotiate contracts.

D.5 Others variables

D.5.1 Quality changes/specification changes

7.78 If any variable in the commodity specification changes, the respondent should be questioned about the change and whether or not new features have been added. If it is a simple change that bears no effect on the price, then the specification should be updated and a marker placed on the commodity description to indicate that it has been changed. If the quality increases (in terms of producer's cost) then this should be reflected in the index as a price fall. If the quality decreases, then this should be reflected as a price rise.

7.79 If the price of the commodity changes and it is solely or partly due to the change in the specification of the product, then the data collection form returned to the respondent should contain the new price, but for index purposes a quality adjustment should be made to record no price changes for the commodity on the price database (as it is not an inflationary pressure causing the price to move). If, for example, the price of the commodity increases by 10 percent, and the respondent assessment is that only 5 percentage points of the increase was related to the pure price change, with the remaining 5 percentage points being due to a different commodity with changed specification being quoted (a quality improvement), then the price relative should increase by only 5 percent. Methods for assessing the effects of quality changes on price changes are outlined and discussed in Chapter 8.

D.5.2 Unique commodities

7.80 A unique commodity is a commodity that is only manufactured once to the specification of an individual customer. Within a group of commodities, each commodity will be different from the others—for example, industrial furnaces, ships or an audit contract. In these cases the price cannot be observed over multiple periods. There are a number of approaches to solving this problem, as follows:

- i. *Model pricing:* Ask the respondent to provide a notional commodity with a basic range of characteristics, based on recent orders. For each period the respondent is asked to supply a hypothetical price quote based on this hypothetical product. It is important to update the commodity specification at regular intervals. model selection that can be used. Refer to Chapter 11 for further discussion.
 - a. An actual commodity sold in some recent period, which is representative of the respondent's output, can be selected and specified in detail as the model to be priced;
 - b. A hypothetical model that is representative of the types of commodities produced by the respondent can be established. While this model may never have been (or never will be) produced, it must represent an item that could be readily produced; and
 - c. A component model can be established. These are used in those cases where no single model can represent the output of the respondent. In such cases a number of models can be selected or a notional model incorporating the key components from the various items produced can be established—that is, incorporating the different types of materials used and different production techniques. In the latter case the model would be purely hypothetical in that it might never be built, but it would nevertheless be representative for measuring price changes.
- ii. *Repeat Recent Real Sale:* Ask the respondent to provide a price quote for a recent real sale and to provide a hypothetical price for this exact commodity design for the subsequent months. If the order is not repeated again after a reasonable interval—for example, 6-8 months—then a replacement commodity is sought.
- iii. *Specification Pricing:* A base model of the commodity or service is agreed with the company and then in each subsequent month the company supplies the price for each individual part of the model—for example, one hour of an accountant's time or a ton of steel and so on. When the data are returned to the office they are collated using a formula agreed with the company to arrive at a price each month.
- iv. *Component Pricing:* This approach entails collecting prices for a selection of component parts and using them as inputs to produce a final output price. It is important to include the prevailing margin achieved by the producer and it is also important to have a dialogue with the producer to ensure that the components remain representative and constitute a very high proportion of the total inputs. For example, a recent EU Task Force report on large capital equipment suggested that this approach would be sufficient if the value added for the assembly of the components did not exceed 10 percent of the total commodity value.

7.81 These approaches are much more burdensome on respondents, since they cannot simply look at recent sales data to provide price quotes. To accurately supply price quotes

using these approaches would lead to the respondent incurring substantial costs, so in practice there is an element of estimation in this process.

7.82 In all of the above unique commodity cases the main difficulty is persuading the respondent of the value of this approach because they do not produce this specific commodity as described. To resolve these issues, a field officer visit may be necessary. It is important to include such base-level commodities like these in XMPs since they are often associated with high value goods, which would not be included otherwise. It is all too easy to select a related, but simple product—for example, in shipbuilding to ignore large unique ships and to concentrate only on small regularly produced commodities such as dinghies. Unique ships and dinghies may have quite different price changes.

7.83 A further approach to solving the unique commodity problem could be to build a hedonic model. This would enable the unique model to be valued from its characteristic set. This method is more normally associated with quality adjustment but could be extended where sufficient data are available. See Chapters 8 and 22 on quality adjustment for more details on this approach.

D.5.3 Unit Values

7.84 In some circumstances it is possible to use unit value indices to overcome the problems of unique commodities, but this is only recommended for commodities with a very narrowly defined commodity group—for example, for road stone. See Chapter 2 and section B.2 above for a discussion of the limitations of unit value indices.

D.5.4 Transfer prices

7.85 Transfer prices are defined in the *1993 SNA* (3.79) as

"affiliated enterprise may set the prices of transactions among themselves artificially high or low in order to effect an unspecified income payment or capital transfer"

Transfer prices should be used with caution because they often do not fully reflect the true value of the goods or services being transacted. It is important to aim to collect market prices, or real transaction prices. The best way to get real transaction prices is to ensure that the price recorded is to a third party, not to another part of the same business. In some circumstances there may be insufficient real market prices for a representative index. Indeed, it is possible that the only price available is to another part of the same business, which is potentially, but not necessarily a transfer price. Careful attention then has to be paid to market price movements for similar commodities to ensure that the inter-enterprise sales reflect market conditions. It is important to avoid recording stable prices for these transactions over the long term if market prices are changing. In addition, obtaining good weight information on the value of output or sales will also be difficult because the traded values used as weights should reflect market prices. A further, more detailed, discussion of such issues is provided in Chapter 19.

D.5.5 Sampling issues

7.86 The objective of price indices is to measure pure price change over time—that is, to measure the extent to which the cost of an identical basket of commodities changes over time, not affected by changes in quality or quantity or the terms of sale. This is often referred to as pricing to constant quality; it is not a simple objective to achieve because the characteristics of commodities being sold in the marketplace, including their terms of sale, change over time. Frequently, the precise commodity priced in one period is no longer available in the next period either because there has been some change in the characteristics of the commodity or something new has taken its place.

7.87 Sampling issues, such as sample loss relevance, avoidance of making quality adjustments, selecting non-comparable replacements, and inadequate matching procedures, greatly affect the representativeness of the sample over time; ignoring such issues could bias the index. Refer to Chapter 9 for further detail.

7.88 XMPI compilers must devise techniques to minimize differences and eliminate their effect on the index.

D.5.6 Price discrimination

7.89 Price discrimination refers to the situation where the same commodity sells at different prices in different markets. An example would be the same grade of wheat sold at different prices in different markets, or a different volume of wheat sold at the same price to different markets. When such price discrimination occurs, the average price of wheat can change over time because of changes in the proportions of wheat sold to each market. The article by Ruffles and Williamson (1997) shows that in the United Kingdom more than three-quarters of exporters in a survey charged different prices for different countries.

7.90 The same commodity of the same quality may be imported at different prices from different suppliers, possibly in different countries, or exported to different foreign purchasers at different prices. How should such price changes be reflected in XMPIs? The answer will depend on the reason for the price discrimination and requires an examination of the various forms of price discrimination. There are four main forms of price discrimination (listed below). All four factors (or any combination) could apply to a particular specification.

7.91 In cases of price discrimination, it is extremely difficult to determine the price change when the destination of the purchaser changes.. In these instances, PPI compilers should specify only the purchasers of product and the quality or conditions of sale differences between purchasers.

D.5.6.1 Differences in selling terms and provision of credit

7.92 The conditions under which goods are sold often vary between markets (buyers). For instance, prices may be lower in one market because the goods are paid for on delivery, while prices in another market may be higher, reflecting the fact that goods are sold on credit.

In these situations it seems reasonable to argue that identical goods are not being sold in each market. What is in fact being sold in the second market is a mixture of the good and credit. It follows that, in these cases, shifts in destination should not be reflected as price changes but XMPIs should be compiled as aggregates of price changes across destinations.

D.5.6.2 Differences owing to timing of contracts

7.93 Where goods are sold on a long-term contract basis, price differences may arise between different markets simply because of differences in the period when the contracts in respect of these markets were signed. In these cases it seems clear that changes in prices owing to changes in destination should be reflected in the index. Failure to do so would run the risk of missing out on long-term price changes for commodities where the destination is changing over time.

D.5.6.3 Competitive pressures

In some markets, goods may have to be sold at lower prices because of competition from other countries (for example, dumping of EU agricultural commodities), while in other markets producers may be able to achieve higher prices because of the absence of such competition. Only if respondents confirm that there is genuinely no change in the specification of the commodity in the two markets, shifts between markets represent pure price changes and should be reflected as such. The *1993 SNA Rev.1* argues that if the price dispersion in a period was not due to quality differences a unit value index should be used. Yet it notes an important exception regarding the case of institutionalized price discrimination. If different purchasers of the same good or service, say electricity, face different prices and the individual purchasers, say commercial customers and private households are unable to change from one price to another, then price indexes should be used. The constraint on the availability to the purchaser of different prices must be institutional and not simply an income constraint.

D.5.6.4 Hidden quality differences

7.94 For some items, such as tinplate, respondents supply prices only for broadly specified commodities. In these cases, destination may serve as a *de facto* quality specification—for example, the quality of tinplate shipped to destination A is different from that shipped to B. In this situation, changes in destination should not be reflected as price changes.

D.6 Field officer visits

7.95 Field officer visits serve two broad purposes. First, field officers are often used in the initialization/recruitment process to identify representative commodities from within the respondents' commodity range and to discuss the exact reporting requirements for the XMPI. (This approach is used by the United States, Australia and France; the French use qualified engineering staff to visit companies.) In some regions (for example, in Europe a detailed survey on commodities by industry of origin (PRODCOM) is conducted by member states) it is known that a group of commodities are manufactured by a company in a particular sector.

In such a case, there are two options when selecting commodities: either let the business pick the most representative commodity (that is, the one that accounts for the largest percentage of the respondent's turnover for the class of product) or let the field officer select the commodity with the respondent. Each approach has advantages and disadvantages. For example, only the respondent knows the best or easiest commodity for them to supply data for; however, it is important to get a price quote for several commodities that are representative of the respondent's commodity range. This may require collaboration between the respondent and the field officer. For more information on commodity selection see Chapter 6.

7.96 The second main purpose of the field officer is to assist respondents with problems in completing returns—for example, in the case of unique commodities or late responses. The field officer contacts and visits the company to understand its specific concerns and problems in completing the form and work with the company to overcome them. This is largely a reactive activity used to solve problems, but another alternative is to have a rolling program of visits so that each respondent (or key respondent) is visited over a set period. This helps to keep the respondent educated and ensures problems do not linger unnoticed for long periods.

D.7 Industry specialists

7.97 The role of the industry specialist is similar to that of the field officer, but the industry specialist concentrates on a narrow range of industries. Since prices are required from very specialized industries such as chemicals and semi-conductors, it is difficult for the statistical office to assure the quality of data returns and have a meaningful dialogue with respondents unless the organization includes analysts with a more detailed knowledge of these complex industries. A small team becomes 'experts' in certain fields—for example, computers. The teams are fully up-to-speed on changes in the market, their respondents' activities within the market, and specific problems relating to completion of survey data. These experts then analyze returns in line with the industry intelligence and support respondents when they provide data.

D.8 Delinquency follow-up

7.98 It is important to achieve high response rates and, in order to achieve this, procedures should be established to follow-up non-responders. Problems with maintaining adequate response rates will occur in price surveys that do not have delinquency follow-up procedures, even when the surveys have statutory penalties.

7.99 Delinquency follow-up can be done using any of the data collection methods outlined above. A reminder telephone call is an effective technique since this enables the respondent to discuss any difficulties they have with the survey at the same time, and it is often possible to take data over the telephone (although a price taken over the telephone should be marked for later verification). This technique has the advantage of generating quick results, but does require the statistical agency to maintain an up-to-date list of contacts and their telephone number. Given the labor-intensive nature of reminder telephone calls it is possible to target these calls on key responders, which are usually the responders with the largest weights.

7.100 A follow-up letter is often effective particularly if the country has a legal penalty for non-response. In such a case it is possible to make the wording of the follow-up letter stronger, with more emphasis on the legal penalty. It is usual to follow a set procedure including the use of a recorded delivery letter if formal legal proceedings are to be conducted for non-response.

E. Respondent Relations

7.101 Respondents are very important to statistical offices, because without them there are no data. Therefore, developing good relations with and gaining the trust of data providers is an integral part of producing good estimates.

E.1 Dealing with refusals

7.102 On occasion, you will come across a respondent who states, “I’ve had enough” or “I’m not doing it anymore.” In general, providing respondents with relevant information related to their concern will ensure they will continue to provide data. In the examples above, refusals could reflect issues with confidentiality, lack of importance, and too many forms.

7.103 Possible ways of dealing with these concerns are as follows:

- i. *Confidentiality:* When dealing with issues of confidentiality, a statistical agency that is independent of other government agencies has an advantage over those that are not. Independence and confidentiality are important to ensure trust of respondents. Reassurance that the data will not be released to any other agency or person is much easier with legislation backing the statistical office.
- ii. *Objective of the Collection:* Reassure the provider that the prices are aggregated into an index that is published monthly or quarterly, and inform the provider of the importance of contributing and the use of the statistics produced.
- iii. *Respondent Workload:* Talk with the respondent to ensure that the data are easy to obtain and that the current specifications are still relevant; see if the provider can get rotated out of the sample if the company has been contributing data for many years.

E.2 Reducing respondent workload

7.104 Apart from the ongoing use of tailored forms, which significantly simplify the collection process for respondents, XMPI compilers can actively reduce provider workload by

- i. Identifying commercially available data that meet the methodological requirements of price indices and using these as a substitute for data collected from respondents. The cost incurred in purchasing these data is compared with

expected collection costs, with the benefit of reducing provider load taken into account; and

- ii. Identifying administrative data sources of prices that meet the methodological requirements of price indices and using these as a substitute for data collected from respondents.

E.3 Surveys of respondents' views

7.105 It is important to be aware of deficiencies in the data collection process. Some of this may be gleaned from the field officer visits discussed in D.6 above. However, user surveys may be carried out on a sample of respondents to identify whether issues raised by individual respondents can be generalized and to consider further possible areas for improvement to the data collection process. Such surveys should not be carried out too frequently to avoid criticisms of an undue burden on the respondents. The user survey should clearly state that its aim is to make the task of responding easier, as well as to improve the accuracy of responses. Such surveys can examine issues which include the adequacy of the commodity specifications, the representativity of the commodities used, the respondent's compliance with requested data definitions, such as transaction as against list prices and their likely use of proposed alternative electronic/telephone data response systems. An example of a user survey for the PPI and XMPIs by the UK Office for National Statistics can be found in (ONS, 2000)¹.

F. Verification

F.1 Verification and validation of prices

7.106 Verification aims to identify potentially incorrect prices as early in the process as possible, consult with the respondent and amend the data if necessary. Three key checks required:

- Data reported were accurately entered into the processing system,
- All requested data were provided, and
- Data reported were valid (outlier detection).

7.107 This section covers only the first two bullet points above, that is, simple data checks at the point that data enter into the XMPI system. Validation checks to assess whether the data returned by respondents are credible in relation to other data for the same industry or commodity and the treatment of data that are not credible are covered in Chapter 10.

7.1 ¹http://www.statistics.gov.uk/downloads/reviews/Producer&TradePriceIndices_Mini_Review2000.pdf

F.2 Verification tolerance

7.108 The first stage in the verification process is the inspection of the data entered into the system for further processing is an accurate reflection of the data returned. This can be either a manual audit or through an automated system. These checks should include :

- All data fields required have been completed,
- The data entered in the data base agree with those reported, and
- all data fields are completed within an expected parameter range.

When the data have been accurately recorded by the statistical office but basic data checks are not passed, the analyst will need to contact the respondent in order to verify the information or to get the correct data. Returned prices may be compared to those received for the previous period. If the price change is outside a specified range, then the price should be marked for further investigation. Respondents providing dubious prices can then be contacted to check that the large change is correct and to provide a reason for the large change. Large price changes fall into two main categories: those that are erroneous and those that are correct but genuinely unusual. The second category is more difficult to deal with because they could be outliers, which might result in the need for special treatment within the estimation procedure. Outlier treatment is discussed in Chapter 10.

F.3 Setting tolerances

7.109 The tolerances for data verification checks should be set so that any changes outside the boundaries of expectation are flagged for the data reviewer.

7.110 Tolerances may need to be set independently for each commodity group. For commodities that have volatile prices, such as oil or seasonal items, it may be appropriate to have quite wide verification tolerances. Other commodities may have more stable prices and so narrower tolerances would be more appropriate. To set verification tolerances for a particular product, price changes over a period of time, say two or more years, need to be analyzed. The range of price changes can then be considered, and the top and bottom 10 per cent, for example, can be used to set the tolerances for verification.

7.111 In addition to checking for large price movements, another check is for prices that have not moved for a considerable period. Most companies will review their prices on a regular basis, often annually. If a company's price has not moved for 15 months, for example, they may be returning the same price out of habit. In these cases the company should be contacted to see if the true price is being returned. In periods of low inflation it is likely that the periods of stability between price changes could get longer and also the number of companies not reporting price changes for considerable periods could increase.

G. Related Price Issues

G.1 Lagged Prices

7.112 In some cases it is not possible to get prices in time for the current period's compilation. In order to ensure that the XMPI is published in a timely manner, the previous available price or lagged price can be used. The need for these lagged prices is often when the required data come from administrative sources, and the delays result from the time required to collate data by the external supplier. Examples include financial intermediation service charges and insurance premiums.

G.2 Seasonal Commodities

7.113 Some commodities are only available for part of the year—for example, items associated with religious festivals and certain fresh fruits or vegetables. A practice commonly adopted in such cases is to carry the last reported price forward, until the next season's trading starts and a new price can be collected. This procedure tends to dampen the index movements when the commodity is out of season, and causes upward and downward movements in the commodity index when the commodity is back in season. One solution is to impute the missing prices based on the short-term movements of prices for similar commodities. An alternative solution is to have variable weights for each period, so that the commodity has a zero weight when not in season. The disadvantage of this is that it makes index point effect analysis less straightforward, since care has to be taken to ensure that the correct weights are applied in each month. See Chapters 11 and 23 on seasonal commodities and Chapter 8 on imputation techniques for more details.

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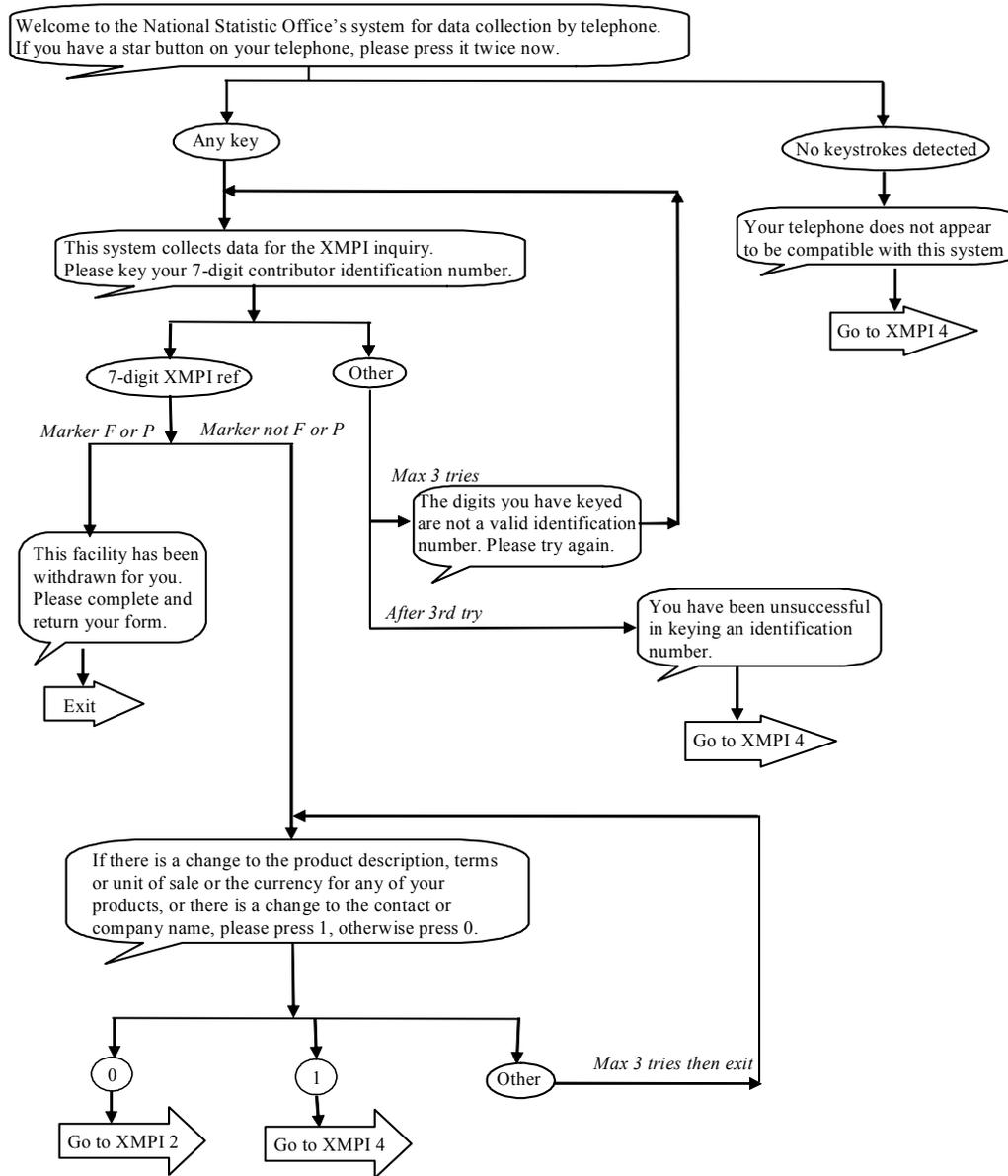
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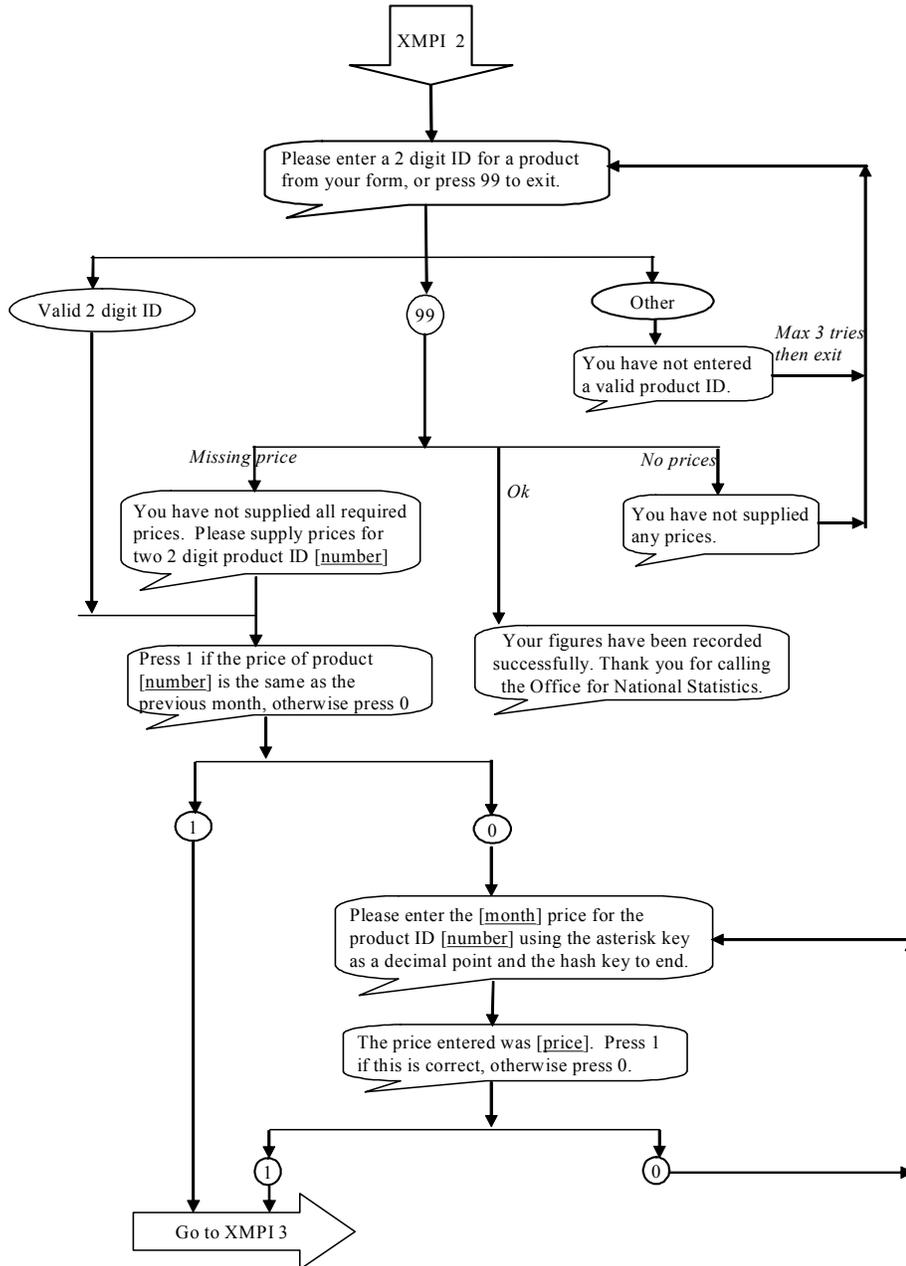
Annexes 7.1 – 7.3 inclusive attached as separate files, Annex 7.4 below



Annex 7.4 Flow Chart of XMPI Telephone Data Entry System

Telephone Data Entry: XMPI

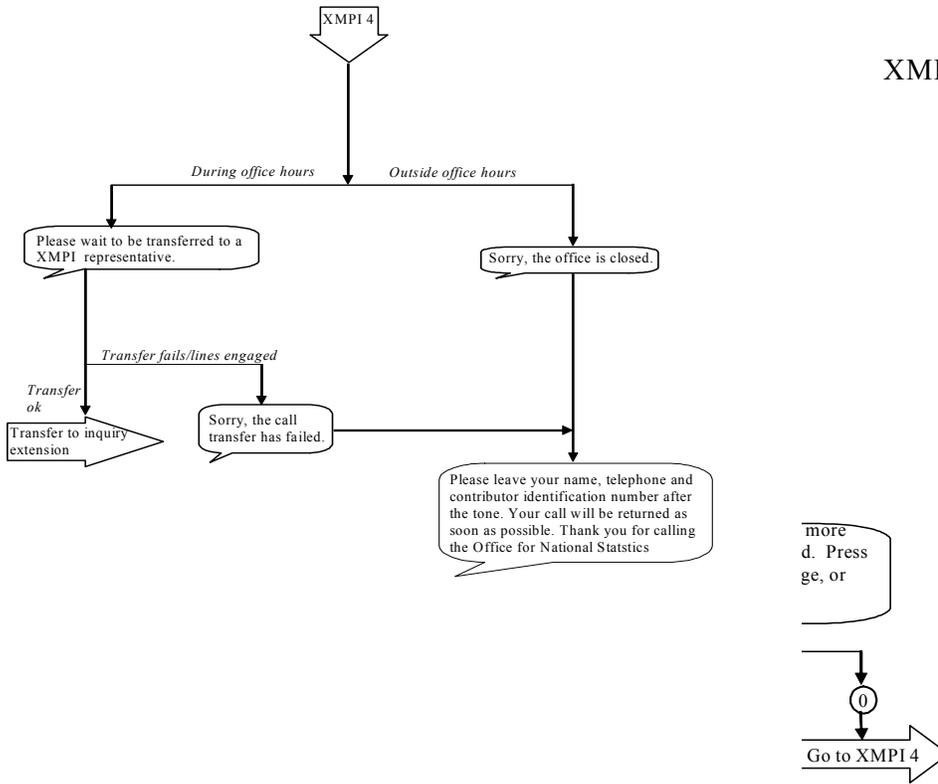
XMPI 2



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PPI v2

2

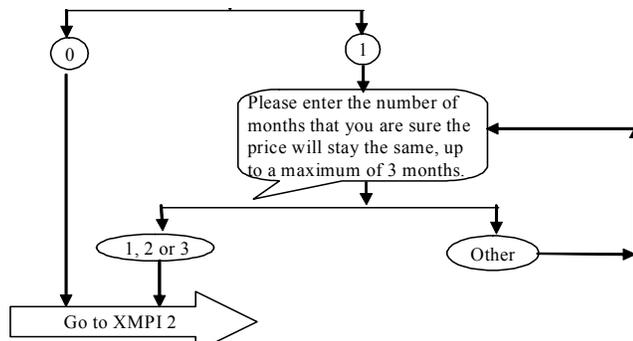


- KEY**
- Dialogue; underlined information inserted by system as appropriate.
 - Entered by caller.
 - Continued on separate page.
 - Internal system processing

30/7/01

PPI v2

4



30/7/01

PPI v2

3