THE SYSTEM OF PRICE STATISTICS

Introduction

14.1 This chapter focuses on the value aggregates for goods and services that relate the major price indices, including the consumer price index (CPI), to one another. The chapter provides a deeper context for the domain of the CPI covered in Chapter 3 and the index weights dealt with in Chapter 4. It also deepens the context for defining the sample unit and the set of products, discussed in Chapter 5.

14.2 We begin by defining a value aggregate for a domain of goods and services as the sum of the products of the prices and quantities of those goods and services. A price index may be characterized as the factor giving the relative change in this value aggregate arising from changes in prices. As such, all the major price index formulae can be expressed as weighted averages of price relatives whose weights are the shares of items in the value aggregate. For the best-known price index formulae expressed as value aggregates of share-weighted averages of price relatives, see Chapter 1, equation (1.2) and Chapter 15, equation (15.8) for the Laspeyres index. See Chapter 1, equation (1.3) and Chapter 15, equation (15.9) for the Paasche index, and Chapter 1, equations (1.11)–(1.12) and Chapter 15, equations (15.21) and (15.81) for the Walsh and Törnqvist indices. As the geometric mean of the Laspeyres and Paasche indices, the Fisher ideal index of Chapter 1, equation (1.10) and Chapter 15, equation (15.12) is also a function of expenditure shares derived directly from the value aggregate.

14.3 To define a price index, we first need to know several things about the value aggregate. The value aggregate defines the following aspects of a price index:

- which commodities or items to include in the index;
- how to determine the item prices;
- which transactions that involve these items to include in the index;
- how to determine the weights, and from which sources these weights should be drawn.

Besides the content of the value aggregates for the major price indices, we also discuss in this chapter their valuation and timing properties. These properties bear importantly on how compilers define the prices and weights of price indices.

14.4 The four principal price indices in the system of economic statistics are the consumer price index (CPI), the producer price index (PPI), and the export and import price indices (XPI and MPI). They are well-known and closely watched indicators of macroeconomic performance. They are direct indicators of the purchasing power of money in various types of transactions and other flows involving goods and services. Consequently, these indices are important tools in the design and conduct of the monetary and fiscal policy of the government. They also are used as deflators to provide summary measures of the volume of goods and services produced and consumed. They thus are also used to inform economic decisions throughout the private sector. They do not, or should not, comprise merely a collection of unrelated price indicators, but provide instead an integrated and consistent view of price developments pertaining to production, consumption, and international transactions in goods and services. By implication, the meaningfulness of all of these indices derives in no small measure from the meaningfulness of the value aggregates to which each refers. Although there are other important price indices, most of which also are discussed in this chapter, these four constitute the backbone of the system of price statistics in most countries, and they will be given special attention.

14.5 Paragraphs 14.8 onwards establish the relationships among the four major price series by associating them with certain of the interlocking aggregates defined in the *System of National Accounts 1993* (*SNA 1993*). The system of national accounts (SNA) has gone through various versions over the years, the 1993 edition of this manual being the latest. We will use SNA to refer to the system of national accounts generically, and *SNA 1993* to refer specifically to the most recent version, as appropriate. The CPI draws its coverage from a variety of accounts in the SNA. At various points along the way, we note whether and how the composition of each value aggregate in the national accounts relates to the aggregate on which the CPI may be defined. Besides the four main price indices and an array of additional useful price indices, we briefly consider labour compensation indices and purchasing power parities in the system of economic statistics.

14.6 As noted in Chapter 2, the CPI is constructed for a range of uses in various countries, but we can identify two broad themes: the *consumption* (sometimes called the cost of living) CPI, and the *transactions* (often called the inflation) CPI. Advocates for the transactions CPI often refer to it as an acquisitions CPI, following the language of the earlier *Consumer price indices: An ILO manual* (Turvey et al., 1989) which used this terminology to distinguish alternative treatments of, for example, owner-occupied housing (p. 15). The term "acquisitions CPI" has a different meaning in the SNA, referring to households' consumption of goods and services secured not only by themselves, but also by non-profit institutions and government on their behalf. We thus use the

term "transactions" instead. In the ILO manual's terminology, what we call a consumption CPI would have been called a "uses" CPI. Either is consistent with current SNA terminology.

14.7 Both types of CPI are oriented towards the price experience of households, but, as its name implies, the consumption CPI focuses on the prices of items on which households make final consumption expenditures, while the transactions CPI focuses on the prices of items on which households make monetary final expenditures on consumption *and* capital formation. Consumption CPIs thus *exclude* capital formation expenditures by households (for example, on their own dwellings), but *may include* both monetary and imputed consumption expenditures (for example, the imputed rent paid by homeowners on their own dwellings). Transactions CPIs focus only on the prices of items on which households make monetary final expenditures, and thus *may include* household capital formation expenditures (for example, net acquisitions of dwellings), but categorically *exclude* expenditures that must be imputed in order to cover households' effective consumption of goods and services. In this chapter, we will further explain the concepts of institutional sector and type of transaction from the SNA that define the distinction and the relationship between the consumption and transactions CPI. In each of the following sections, as relevant, we will discuss the kinds of expenditures defining the items and weights appropriate for each of these two main types, referring to the sum of expenditures corresponding to the consumption CPI as *expenditure aggregate #1* and that for the transactions CPI as *expenditure aggregate #2*.

National accounts as a framework for the system of price statistics

14.8 The system of national accounts is the core system of value aggregates for transactions and other flows in goods and services. It is clearly of broad economic interest. Granted, the value aggregates of the major price indices need not be coincident with the major value aggregates in the national accounts. The national accounts aggregates, however, represent the major flows of goods and services and levels of tangible and intangible stocks in the economy. The major price indices therefore should have a clear relationship to these aggregates. This chapter explains the value aggregates now in common use by national authorities for the major price indices, or planned for future use, by assembling them from components identified in the SNA.

14.9 The *SNA 1993* describes the system of national accounts as follows:

> 1.1 The System of National Accounts (SNA) consists of a coherent, consistent and integrated set of macroeconomic accounts, balance sheets and tables based on a set of internationally agreed concepts, definitions, classifications and accounting rules. It provides a comprehensive framework within which economic data can be compiled and presented for purposes of economic analysis, decision taking and policy making.

The accounts cover the major economic activities taking place within an economy, such as production, consumption, financing and the accumulation of capital goods. Some of the flows involved, such as income, saving, lending and borrowing, do not relate to goods and services and do not factor into price and quantity components. However, the SNA also contains a comprehensive framework, the supply and use table, discussed in more detail below, which establishes and displays the interrelationships between all the main flows of goods and services in the economy. The coverage and contents of these flows are defined, classified and measured in a conceptually consistent manner. Within this table, the linkages between major flows of goods and services associated with activities such as production, consumption, distribution, importing and exporting can be seen in a simple and direct way. The table provides an ideal framework for designing and organizing a system of internally consistent price statistics that relate to a set of economically interdependent flows of goods and services. The table not only establishes the interrelationships between consumer, producer, import and export prices themselves, but also their linkages with price indices for major macroeconomic aggregates such as gross domestic product (GDP).

14.10 In this overview of price indices, we first take a top-level view of the major national accounts aggregates. We then begin a review of the underlying construction of these aggregates by considering first the types of economic agents in the economy that are recognized in the national accounting system, and second, the economic accounts kept on them involving goods and services flows that build up to the main aggregates. As these accounts are built up from their foundations, precise relationships emerge between the well-known headline price indicators – the PPI, CPI, XPI and MPI – and the closely watched national accounts aggregates.

Aggregate supply and use of goods and services

14.11 At the most aggregate level, the supply and use of goods and services in the national accounts is the simple textbook macroeconomic identity equating total supply with total uses. Total supply is the sum of output Y, imports M, and taxes less subsidies on products T. Total use is the sum of intermediate consumption Z, the final consumption of households C and government G, capital formation I, and exports X:

$$Y + M + T = Z + C + G + I + X \qquad (14.1)$$

14.12 Rearranging this identity by subtracting intermediate consumption and imports from both sides, we arrive at the familiar alternative expressions for GDP from the production (value added) and expenditure approaches:

$$(Y - Z) + T = \text{Value added} + T \equiv C + C + I + X - M$$

$$= \text{Gross domestic product} \qquad (14.2)$$

GDP is, of course, internationally recognized as the central national accounts aggregate for measuring

economic performance. It is essentially a measure of production, as distinct from final demand. More precisely, it measures the value added of the productive activities carried out by all the economic agents resident in an economy. As imports are not included in GDP, a price index for GDP tracks internally generated inflation. Compiling indices for tracking the parts of relative change in GDP and its components that can be attributed to price and volume change is among the most important objectives for the development of price statistics in modern statistical systems.

14.13 As explained in more detail later, the supply and use table in the SNA is a comprehensive matrix covering the economy as a whole that exploits the identities (14.1) and (14.2) at a disaggregated level. Each row of the matrix shows the total uses of a commodity, or group of commodities, while each column shows the total supplies from domestic industries and imports. The table provides an accounting framework that imposes the discipline of both conceptual and numerical consistency on data on flows of goods and services drawn from different sources. The flows have to be defined, classified and valued in the same way, while any errors have to be reconciled. The table provides a good basis for compiling a set of interdependent price and quantity indices. In the following sections, we consider the various elements or building blocks that make up the table before examining the table as a whole.

Institutional units and establishments

14.14 In building the accounting system and the major aggregates Y, M, T, Z, C, G, I and X of equations (14.1) and (14.2), the *SNA 1993* first organizes the economy of a country into the kinds of entities or agents that undertake economic activity. These agents are called *institutional units* and comprise five types resident in the economy, as well as a single non-resident category, the rest of the world. An institutional unit is said to be resident in an economy if its primary centre of economic interest is located there. A centre of economic interest is operationally defined in part by the duration of physical presence. For example, a household is resident in an economic territory if it lives within the territory's boundaries for a year or more. The five types of resident institutional units are: non-financial corporations; financial corporations; general government; households; and non-profit institutions serving households (NPISHs). The *SNA 1993* associates with institutional units the ability to hold title to productive assets, and thus they represent the smallest units on which complete balance sheets can be compiled.

14.15 As noted earlier, institutional units can engage in producing and consuming goods and services and in capital formation, accumulating goods and services as productive tangible and intangible assets. To analyse production, the *SNA 1993* identifies a smaller unit or agent than an institutional unit, called an *establishment* or *local kind of activity unit* (LKAU). Within an institutional unit, the establishment is the smallest unit organized for production whose costs and output can be separately identified. Generally, establishments special-

ize in the production of only a few types of output at a single geographical location. To compile productivity statistics, analysts also need detail on produced and non-produced *non-financial* assets (capital) by establishment from multi-establishment institutional units. This is because, as we will see, these statistics use an industry or activity classification of establishments rather than institutional units. Some institutional units may own establishments in more than one industry. On the other hand, an account of financial assets and liabilities by establishment is not needed and not generally available from the accounts of institutional units owning multiple establishments. The latter would be necessary to make establishment balance sheets.

14.16 The *SNA 1993* classification of institutional units into sectors is shown in Box 14.1. The *SNA 1993* classification of institutional units does not strictly follow the legal status of institutional units, but rather their function. Hence, a government-owned non-financial enterprise producing output sold at prices substantially covering its costs and for which a balance sheet can be compiled would be classified as a non-financial corporation, along with non-financial corporations that are corporate legal entities. For further details, see *SNA 1993*, Chapter IV. Notice that the *SNA 1993* institutional sectors represent the units typically covered in economic and household censuses and surveys. The SNA focuses on the activities of institutional units that are resident in a nation or economic territory. It makes provision for the rest of the world (S.2 in Box 14.1) only to capture the transactions of resident institutional units with non-residents. Transactions of non-residents with other non-residents are out of scope for the national or regional accounts of a given country or region.

14.17 The classification of household institutional units into sectors is highly relevant for analysing the incidence of price change. As shown in Box 14.1, the *SNA 1993* defines household subsectors according to the major source of income: mixed income (mostly profits of household enterprises), compensation (wages, salaries and compensation in kind), or property income (rents, dividends and interest). There are not the only sectors of households that may be of interest to users of the CPI, however. In addition to the *source* of income, analysts often (perhaps more often) are interested in the *level* of income. The shares of particular goods and services in household expenditures are likely to show more variation across income level than across major source of income. For example, to shed light on the price experience of poor (low-income) households we would want to know whether there is a significant difference in the shares of expenditure on specific goods and services for poor as compared with non-poor households. A good example would be the relative importance of expenditures for used durable goods. As we will see, consumer durables are measured in the SNA on an acquisitions-less-disposals basis. While poor households normally would be net purchasers of such goods, richer households would tend to be net sellers. A change in the prices of used goods thus would have a very different impact on the CPIs for the two groups of households.

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Box 14.1 Institutional sectors in the *System of National Accounts 1993*

S.1 Total economy
  S.11 Non-financial corporations
    Ultimate subdivisions: public, national private and foreign controlled
  S.12 Financial corporations
    Ultimate subdivisions: public, national private and foreign controlled
    S.121 Central bank
    S.122 Other depository corporations
        S.1221 Deposit money corporations
        S.1222 Other depository corporations, except deposit money corporations
    S.123 Other financial intermediaries, except insurance corporations and pension funds
    S.124 Financial auxiliaries
    S.125 Insurance corporations and pension funds
  S.13 General government
    Alternate scheme n = 1, social security funds shown as a separate branch of government S.1314
    Alternate scheme n = 2, social security funds included as components of central, state, and local branches, and S.1314 deleted
    S.13n1 Central government
    S.13n2 State government
    S.13n3 Local government
    S.1314 Social security funds
  S.14 Households
    Classified according to the largest source of income received
    S.141 Employers *(mixed income, owning an unincorporated enterprise with paid employees)*
    S.142 Own account workers *(mixed income,[1] owning an unincorporated enterprise without paid employees)*
    S.143 Employees *(compensation of employees)*[2]
    S.144 Recipients of property and transfer income[3]
        S.1441 Recipients of property income
        S.1442 Recipients of pensions
        S.1443 Recipients of other transfers
  S.15 Non-profit institutions serving households (NPISHs)
  S.2 Rest of the world

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[1]To understand how subsectors S.141 and S.142 of households are formed, an explanation of the term "mixed income" is in order. This, in turn, requires consideration of the national accounts income concept of operating surplus. The operating surplus of an enterprise is the residual of the value of output less purchases of goods and services, inputs, wages and salaries, employers' social contributions (social security and pension payments), and taxes net of subsidies payable on production that are unrelated to products. The mixed income of household unincorporated enterprises is algebraically defined identically with the operating surplus of other enterprises. However, for unincorporated household enterprises, the compensation of the owners or proprietors of the enterprise may not be included in the recorded compensation of employees item, and thus the difference between output and operating cost will include compensation for the owners' labour. The distinct terminology merely recognizes that the owners' wages are often inextricably mixed with the operating surplus for these units. [2]Compensation of employees comprises wages and salaries, and employer-provided benefits comprising employers' social contributions. [3]Property income comprises interest, dividends and rent.

Accounts of institutional units

14.18 In equations (14.1) and (14.2), we identified the basic aggregates comprising the total supply and use of goods and services in the economy, and derived GDP in terms of these aggregates. To see how to separate the price and volume components of supply and use, it is necessary to build these basic aggregates up from the institutional sector accounts of the economy's economic agents. In this process it is important to detail the production and consumption activities of these agents, as well as the types of goods and services they produce and consume. The framework organizing this information is the supply and use table. As this table is built up, we effectively also begin to accumulate data on the product share weights s needed for computing price index formulae (Chapters 1, 3, and 15–17). The basic accounts of the SNA in which all of these aggregates are recorded at the level of institutional units are the production, use of income, capital, and external goods and services accounts. These accounts organize the information for the following top-level aggregates:

- *Production account*: output Y, intermediate consumption Z, and value added $Y - Z$;

- *Use of income account*: household consumption C and government consumption G;
- *Capital account*: capital formation I;
- *External goods and services account*: exports X and imports M.

Recording transactions in goods and services

14.19 Before turning to further elaboration on these four goods and services accounts, it is important to specify how each entry in the value aggregates comprising them is to be recorded. The items i in the value aggregate equation (15.1) of Chapter 15 represent detailed goods and services flows classified into categories of transactions. There are two defining aspects of recording transactions: timing and valuation.

14.20 Regarding the *timing* of transactions, to associate each transaction with a date, the national accounts consider a transaction to have been consummated when a liability to pay is created between the units involved. For flows of goods and services, this occurs when the ownership of the good is exchanged or when the service is delivered. When change of ownership occurs or the

service is delivered, a transaction is said to have accrued. In general, this time need not be the same as the moment at which the payment actually takes place.

14.21 There are two *valuation* principles in the national accounts, one for suppliers and one for users. For suppliers, transactions in goods and services are to be valued at basic prices. The basic price is the price per unit of good or service receivable by the producer. We use the term receivable to indicate that the price refers to an accrued transaction for the seller, and the term payable to indicate a transaction that has accrued to the purchaser. As the producer does not receive taxes (if any) on products, but does receive subsidies (if any) on products, taxes on products are excluded from the basic price, while subsidies on products are included. The producer also does not receive separately invoiced transport and insurance charges provided by other suppliers, or any distribution margins added by other, retail or wholesale service producers, and these are also excluded from the basic price. In contrast, the user, as purchaser, pays all of these charges, and users' purchases are therefore valued at purchasers' prices, which add taxes net of subsidies on products and margins for included transport, insurance and distribution services to the basic price.

14.22 The *SNA 1993* distinguishes between taxes on products and other taxes on production. Taxes net of subsidies on products T include all taxes payable per unit or as a fraction of the value of goods or services transacted. Included in T are excise, sales, and the non-refundable portion of value added taxes, duties on imports and taxes on exports. Subsidies on products include all subsidies receivable per unit or as a fraction of the value of goods or services produced, including in particular subsidies paid on imports and exports. Other taxes on production comprise, for example, taxes on real property and taxes on profits. Other subsidies on production include, for example, regular payments by the government to cover the difference between the costs and revenues of loss-making enterprises. Of total taxes and subsidies on production, only taxes and subsidies on products are considered in defining basic and purchasers' prices. By implication, there are no taxes payable on products included in either of the aggregates Y or M,

while subsidies receivable on products are included in these aggregates.

14.23 Accordingly, output Y and imports M in equations (14.1) and (14.2) are valued at basic prices, to which are added taxes less subsidies on products T to arrive at total supply. The reader may have noted that transport, insurance and distribution margins have somehow disappeared after having been introduced. Whether these services are included with the good or invoiced separately does not affect the total expenditure on goods and services by the purchaser. For the economy as a whole, these transactions cancel out, but when we consider industry or activity and product detail, they will have redistributive effects among goods and services products. This point is revisited in the discussion of the supply and use table below.

14.24 The components of total uses are valued at purchasers' prices. This is straightforwardly interpreted for the final consumption of households and government. For capital formation expenditures, the notion of purchasers' prices also includes the costs of "setting up" fixed capital equipment. For exports, purchasers' prices also include export taxes net of subsidies, according to the "free on board" (fob) value at the national frontier. We now discuss each of the four major goods and services accounts in turn.

Production

14.25 An institutional unit engaged in production is said to be an *enterprise*. By implication, any of the five types of resident institutional units can be an enterprise. The production account for enterprises in the *SNA 1993* appears, with minor reordering of elements, essentially as shown in Table 14.1. An identical presentation also applies to the establishments or local kind of activity units (LKAUs) owned by enterprises. In fact, an establishment can be defined operationally as the smallest unit for which a production account can be constructed. There are cases in which an establishment or LKAU is synonymous with or at least inseparable from the institutional unit that owns it. This is true of single-establishment corporations and of household unincorporated enterprises, for example. In other cases, an enterprise may own multiple establishments. The

Table 14.1   Production account for an establishment, institutional unit or institutional sector

SNA 1993 items in bold refer to flows in goods and services

Uses	Resources
P.2 Intermediate consumption (purchasers' prices)	**P.1 Output (basic prices)**
B.1 *Gross value-added* (balances the account; that is, it is the difference between output P.1 and intermediate consumption P.2)	
	Of which, memorandum items breaking down total output for classifying the market/non-market status of the producer unit: **P.11 Market output** **P.12 Output for own final use** **P.13 Other non-market output**

production account can also be produced for various establishment and enterprise groupings, including, of course, institutional sectors, but also for establishment industry or activity groups. In the production account and throughout the *SNA 1993*, the transaction codes beginning with P refer to entries for transactions in goods and services. The codes beginning with B refer to so-called "balancing items", which are defined residually as the difference between a resources total and the sum of itemized uses of those resources.

14.26   For classifying an establishment or LKAU, output is broken down into market output (P.11), which is sold at "economically significant prices" substantially covering the cost of production, and two types of non-market output that are provided without charge or at prices so low they bear no relationship to production cost. The two types of non-market output are output for own final use (P.12) and other non-market output (P.13). Output for own final use includes the production of, for example, machine tools and structures (fixed capital formation items) by an establishment for the use of the establishment itself or other establishments in the same enterprise, the imputed rental value of certain productive assets owned by households, such as (and currently limited to) owner-occupied dwellings, and the production of certain other unincorporated household enterprises, such as agricultural products produced by farmers for consumption by their own families or employees. Other non-market output comprises the output of general government and non-profit institutions serving households distributed free of charge or sold at prices that are not economically significant. In constructing a price index, we will necessarily be focusing on those transactions of establishment units that involve economically significant prices, and thus on market output (P.11). The prices collected for market output items may also, however, be used to value the own final use portion of non-market output (P.12). Our scope of coverage for price indices thus extends to cover this component of non-market output as well.

14.27   A production unit's resources derive from the value of its output, and its uses of resources are the costs it incurs in carrying out production. The production account therefore uses both the basic price and purchasers' price methods of valuation, as appropriate to a production unit in its roles as a supplier and a user of products. For the supply (resources) of goods and services, products are valued at basic prices, the national currency value receivable by the producer for each unit of a product. The prices include subsidies, and exclude the taxes on products and additional charges or margins on products to pay for included retail and wholesale trade services, and for included transport and insurance. For uses of goods and services, products are valued at purchasers' prices, the national currency value payable by the user for each unit of a product, including taxes on products as well as trade and transport margins, and excluding subsidies on products.

14.28   *Product detail in the production account.* In addition to breaking output down into its market and non-market components, output and intermediate consumption also can be broken down by type of product.

Classifying product types using, for example, the international standard Central Product Classification (CPC), the production account for each establishment could be arranged to appear as in Table 14.2. Table 14.2 effectively gives the core structure of the report form of the typical establishment survey providing source data on production for the national accounts.

14.29   *Industry detail in the production account.* With the values of total output by product, and total market and non-market outputs in Table 14.2 for each establishment, we then classify the establishment by its principal activity or industry, and market/non-market status. To reflect the information required for this classification, positions for the activity and market/non-market classification codes of the establishment are shown at the top of Table 14.2. The activity classification involves principally, if not exclusively, sorting establishments according to the types of product produced (CPC or other product code, such as the Classification of Products by Activity) for which the total output is greatest. The major categories of the International Standard Industrial Classification of All Economic Activities (ISIC), Revision 3, are shown in Box 14.2 below.

14.30   As indicated in Table 14.2, The *SNA 1993* recommends use of the International Standard Industrial Classification (ISIC) for all economic activities, the CPC for domestic products, and the closely related Harmonized Commodity Description and Classification System (HS) for exported and imported products. Each country may adapt the international standard to its specific circumstances. If the adaptation amounts to adding further detail, the classification is said to be derived from the international standard. The *Nomenclature générale des Activités économiques dans les Communautés européennes* (NACE, the General Industrial Classification of Economic Activities within the European Communities) is an industrial classification derived from the ISIC. If the adaptation reorganizes the way in which detailed categories are grouped compared with the international standard, but provides for a cross-classification at some level of detail, it is said to be related. The North American Industrial Classification System (NAICS) of Canada, Mexico and the United States is an industrial classification related to the ISIC. The European Commission's PRODCOM classification of industrial products is derived from its Classification of Products by Activity (CPA) which, in turn, is related to the international standard CPC through a cross-classification defined at a high level of product detail.

14.31   *The output aggregate of the producer price index and the production account.* The producer price index (PPI) is an index of the prices of the outputs of establishments. The position of the PPI in the *SNA 1993* is defined by the relationship of its output value aggregate to those defined in the national accounts. In Box 14.2, we consider the composition of the PPI value aggregate according to its industry coverage, arguing that the PPI's industry coverage should be complete. Considering further market and non-market production within an industry group of establishments that are classified according to market status, the PPI's coverage could extend both to the market output (P.11) and output for own final use

Table 14.2   Production account with product detail for an establishment or local kind of activity unit

SNA 1993 items in bold refer to flows in goods and services

Establishment ID: eeeeeeee

Activity/Industry code (ISIC): aaaa

Institutional unit ID: uuuuuuuu

Institutional sector code: S.nnnnn

Market status: P.1*n*

Uses	Resources
P.2 **Intermediate consumption (purchasers' prices),** *of which:*	**P.1** **Output (basic prices),** *of which:*
CPC 0 Agriculture, forestry and fishery products CPC 1 Ores and mineral; electricity, gas, and water CPC 2 Food products, beverages and tobacco; textiles, apparel and leather products CPC 3 Other transportable goods, except metal products, machinery and equipment CPC 4 Metal products, machinery and equipment CPC 5 Intangible assets; land; constructions; construction services CPC 6 Distributive trade services; lodging; food and beverage serving services; transport services; and utilities distribution services CPC 7 Financial and related services; real estate services; and rental and leasing services CPC 8 Business and production services CPC 9 Community, social and personal services	CPC 0 Agriculture, forestry and fishery products CPC 1 Ores and mineral; electricity, gas, and water CPC 2 Food products, beverages and tobacco; textiles, apparel and leather products CPC 3 Other transportable goods, except metal products, machinery and equipment CPC 4 Metal products, machinery and equipment CPC 5 Intangible assets; land; constructions; construction services CPC 6 Distributive trade services; lodging; food and beverage serving services; transport services; and utilities distribution services CPC 7 Financial and related services; real estate services; and rental and leasing services CPC 8 Business and production services CPC 9 Community, social and personal services
B.1 *Gross value-added*	
	Memorandum items breaking down total output for classifying the market/non-market status of the producer: **P.11 Market output** **P.12 Output for own final use** **P.13 Other non-market output**

(P.12) identified in Table 14.2 when this account is considered for all establishments in the economy. Although the latter is technically non-market output, it would be valued at the basic prices the establishment would receive were that own-use production to be sold.

14.32   *The expenditure aggregate of the consumer price index and the production account.* Consumption from own production is a significant fraction of total consumption, comprising both goods and services. For goods produced by households, as noted in the *SNA 1993*:

> 6.24 The System includes the production of all goods within the production boundary. At the time the production takes place it may not even be known whether, or in what proportions, the goods produced are destined for the market or for own use. The following types of production by households are, therefore, included whether intended for own final consumption or not:
>
> (a) The production of agricultural products and their subsequent storage; the gathering of berries or other uncultivated crops; forestry; wood-cutting and the collection of firewood; hunting and fishing;
>
> (b) The production of other primary products such as mining salt, cutting peat, the supply of water, etc.;
>
> (c) The processing of agricultural products; the production of grain by threshing; the production of flour by milling; the curing of skins and the production of leather; the production and preservation of meat and fish products; the preservation of fruit by drying, bottling, etc.; the production of dairy products such as butter or cheese; the production of beer, wine, or spirits; the production of baskets or mats; etc.;

> (d) Other kinds of processing such as weaving cloth; dress making and tailoring; the production of footwear; the production of pottery, utensils or durables; making furniture or furnishings; etc.
>
> The storage of agricultural goods produced by households is included within the production boundary as an extension of the goods-producing process. The supply of water is also considered a goods-producing activity in this context. In principle, supplying water is a similar kind of activity to extracting and piping crude oil.
>
> 6.25 It is not feasible to draw up a complete, exhaustive list of all possible productive activities but the above list covers the most common types. When the amount of a good produced within households is believed to be quantitatively important in relation to the total supply of that good in a country, its production should be recorded. Otherwise, it is not worthwhile trying to estimate it in practice.

For services, the *SNA 1993* notes housing services as the sole – but for most countries extremely important – item of production for own consumption:

> 6.29 The production of housing services for their own final consumption by owner-occupiers has always been included within the production boundary in national accounts, although it constitutes an exception to the general exclusion of own-account service production. The ratio of owner-occupied to rented dwellings can vary significantly between countries and even over short periods of time within a single country, so that both international and intertemporal comparisons of the production and consumption of housing services could be distorted if no imputation were made for the value of

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Box 14.2 Coverage of industries or activities by the producer price index in terms of aggregate output value

The principal economic activities of the International Standard Industrial Classification of All Economic Activities (ISIC), Revision 3, are:

A   Agriculture, hunting and forestry
B   Fishing
C   Mining and quarrying
D   Manufacturing
E   Electricity, gas and water supply
F   Construction
G   Wholesale and retail trade; repair of motor vehicles, motorcycles, and personal and household goods
H   Hotels and restaurants
I   Transport, storage and communications
J   Financial intermediation
K   Real estate, renting and business activities
L   Public administration and defence; compulsory social security
M   Education
N   Health and social work
O   Other community, social and personal service activities
P   Private households with employed persons
Q   Extra-territorial organizations and bodies

These are characteristic of the activities identified in most national industrial classifications. In assembling data on the supply and use flows in the economy, a detailed industry production account such as given in Table 14.2 is effectively constructed for each type of activity in the economy, whose major categories are shown in the ISIC list above. With the product output and expenditure detail in Table 14.2, we can show more explicitly the typical goods and services coverage of the PPI within the output aggregate (P.1) of the production account for each industry. In most countries, PPIs cover industries that produce goods, such as the mining and manufacturing activities (C–D) and some-times also agriculture (A) and fishing (B), and construction (F), as well as the two industrial service activities – electricity, gas and water supply (E) and transport, storage and communications (I). In principle, the PPI should cover the market output of all activities, and a number of countries are currently working on extending PPI coverage to the remaining service-producing activities besides transport and utilities.

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own-account housing services. The imputed value of the income generated by such production is taxed in some countries.

The SNA imputes the value of such consumption at the equivalent market value of the output households produce for their own purposes.

14.33 In some cases, however, the market equivalent method of valuing production for own consumption is not viable because sufficiently similar market equivalents to the items supplied from own production are not available, or they are sufficiently rare that it is too expensive to obtain information on them or too unreliable to base estimates on such information. In these cases, production cost approaches are taken. The source of data for the production cost approaches is, in part, the household production account as regards goods and services purchased for intermediate consumption. The ultimate source of primary information for the household production account is principally the household expenditure survey, though specialized surveys of household business activity may also be undertaken for this purpose. For the shelter services provided by houses occupied by their owners, for example, the production account would be the source of expenditures on utilities, maintenance, and do-it-yourself repair items of intermediate consumption that would be used, in part, to determine the cost to an owner-occupant of the services he or she derives from his or her own dwelling. For the own production of agricultural produce, purchases of seed, fertilizer, and small garden tools might be recorded as intermediate consumption. Particularly for the latter, however, it is often difficult to distinguish between the intermediate production expense of production for own consumption and final consumption expenditure for maintaining decorative landscaping.

Final consumption

14.34 Consumption of goods and services in the *SNA 1993* is shown in the use of income account, which appears essentially as in Table 14.3 for each institutional unit. It is recalled that the accounts pertaining to goods and services in the *SNA 1993* that can be decomposed into price and volume components, and that would thus draw our interest as price index compilers, are designated by the codes P.n. Items of final consumption are designated by P.3 with extensions: P.3 comprises individual consumption expenditure (P.31) and collective consumption expenditure (P.32).

14.35 *Individual consumption, actual consumption, and household consumption expenditures*. The SNA distinguishes individual from collective goods and services, a distinction that is equivalent to that between private and public goods in economic theory. The distinction is mainly relevant to services. Individual services are provided to individual households and benefit those particular households, whereas collective services are provided to the community, for example services such as public order, administration, security and defence. Many individual services, however, such as education, health, housing and transport, may be financed and paid for by government or non-profit institutions and provided free or at a nominal price to individual households. A large part of government consumption expenditure is not on public goods but on goods or services supplied to individual households. These individual consumption expenditures by governments and NPISHs are described as *social transfers in kind* in the *SNA 1993*.

14.36 The concept of "household consumption" can have three distinct meanings. First, it can mean the total set of individual consumption goods and services actually acquired by households, including those received as

Table 14.3   Use of income account for institutional units and sectors

SNA 1993 items in bold refer to flows in goods and services

Institutional unit ID: uuuuuuuu Institutional sector code: S.nnnnn

Uses	Resources
P.3 Final consumption expenditure (purchasers' prices)[1]	B.6 *Disposable income*[2]
P.31 Individual consumption expenditure, *of which:*	
P.311 Individual consumption expenditure, except from production on own account, and imputed consumption expenditure, household sector S.14 only	
P.312 Imputed expenditure on owner-occupied housing services, household sector S.14 only	
P.313 Financial intermediation services implicitly measured (FISIM)	
P.314 Other imputed individual consumption expenditure	
P.32 Collective consumption expenditure (general government sector S.13 only)	
D.8 Adjustment for the change in the net equity of households in pension funds[3]	
B.8 *Saving* (balances the account; that is, it is the difference between disposable income B.6 and the sum of expenditures P.3 and adjustment D.8)	

[1]By definition, corporations have no final consumption in the *SNA 1993*. Thus, item P.3 and its subdivisions appear with non-zero entries only for household, government, and non-profit institutions serving households (NPISH) units. [2] The *SNA 1993* derives disposable income in a sequence of accounts producing the balancing items: value added B.1 (production account), operating surplus B.2 and mixed income B.3 (generation of income account), balance of primary incomes B.5 (allocation of primary income account), and disposable income B.6 (secondary distribution of income account). Collapsing all of these steps, disposable income B.6 is value added B.1 less (net) taxes on production and imports (payable) D.2 plus (net) subsidies D.3 (receivable), plus compensation of employees receivable, plus (net) property income (receivable) D.4, less (net) taxes on income and wealth (payable) D.5, less (net) social contributions (payable) D.61, plus (net) social benefits (receivable) D.62, less (net) other transfers (payable) D.7. [3] This adjustment reflects the treatment by the *SNA 1993* of privately funded pensions as owned by the household beneficiaries of such plans. It maintains consistency between the income and accumulation accounts in the system. It is not relevant to price and volume measurement (see *System of National Accounts 1993*, Chapter IX, Section A.4 for further details).

social transfers in kind. Second, it can mean the subset which households actually pay for themselves. To distinguish between these two sets, the SNA describes the first as the *actual final consumption* of households and the second as *household final consumption expenditures*. A third possible interpretation of household consumption is that it means the actual physical process of consuming the goods and services. It is this process from which utility is derived and that determines the household's standard of living. The process of consuming or using the goods or services can take place some time after the goods or services are acquired, as most consumer goods can be stored. The distinction between acquisition and use is most pronounced in the case of consumer durables that may be used over very long periods of time. The treatment of durables is discussed further in Box 14.3.

14.37   The existence of social transfers in kind is not generally recognized in CPIs, although it is desirable to take account of them, especially when considering changes in the cost of living. Moreover, governments may start to charge for services that were previously provided free, a practice that has become increasingly common in many countries in recent years. The goods and services provided free as social transfers could, in principle, be regarded as also being part of household consumption expenditures but as having a zero price. The shift from a zero to positive price is then a price increase that could be captured by a consumer price index.

14.38   *Monetary and imputed expenditures*. Not all household expenditures are monetary. A monetary expenditure is one in which the counterpart to the good or service acquired is the creation of some kind of financial liability. This may be immediately extinguished by a cash payment, but many monetary expenditures are made on credit. Household consumption expenditures also include certain imputed expenditures on goods or services that households produce for themselves. These are treated as expenditures because households incur the costs of producing them (in contrast to social transfers in kind, which are paid for by government or non-profit institutions).

14.39   The imputed household expenditures recognized in the SNA include all those on goods that households produce for themselves (mainly agricultural goods in practice), but exclude all household services produced for own consumption *except* for housing services produced by owner-occupants. The imputed prices at which the included goods and services are valued are their estimated prices on the market. In the case of housing services, these are imputed market rentals. In practice, most countries follow the SNA by including owner-occupied housing in the CPI. Other imputed prices, such as the prices of vegetables, fruit, or dairy or meat products produced for own consumption, may be included if they comprise a sufficiently large component of household consumption expenditure.

14.40   *Product detail in the use of income account*. As with the production accounts of the establishments owned by institutional units, we can consider extending the product detail of goods and services consumption in the use of income account according to the type of product consumed. In order to maintain the integration of the system of price and volume statistics on consumption with those we have just covered on production, products

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Box 14.3 Treatment of housing and consumer durables in the system of national accounts and in consumer price indices

Dwellings are fixed assets. Purchases of dwellings by households therefore constitute household gross fixed capital formation and are not part of household consumption. They cannot enter into a price index for household consumption. Fixed assets are used for purposes of production, not consumption. Dwellings have therefore to be treated as fixed assets that are used by their owners to produce housing services. The system of national accounts (SNA) actually sets up a production account in which this production is recorded. The services are consumed by the owners. The expenditures on the services are imputed, the services being valued by the estimated rentals payable on the market for equivalent accommodation. The rentals have to cover both the depreciation of the dwellings and the associated interest charges or capital costs.

The existence of these imputed expenditures on owner-occupied housing services has always been recognized in national accounts and most countries have also included them in their consumer price indices (CPIs), even though other imputed expenditures are not included.

Consumer durables, such as automobiles, cookers and freezers, are also assets that are used by their owners over long periods of time. In principle, they could be treated in the same way as dwellings and be reclassified as fixed assets that produce flows of services that are consumed by their owners. For certain analytic purposes, it may be desirable to treat them this way. To do so in the SNA, however, would not simply be a matter of estimating the market rentals that would be payable for hiring the assets. It would also be necessary to set up production accounts in which the durables are used as fixed assets. This has traditionally been regarded as too difficult and artificial. There are also objections to extending further the range of imputed flows included in the SNA and gross domestic product. In practice, therefore, expenditures on durables are classified in the SNA as consumption expenditures and not as gross fixed capital formation, a practice that is carried over into CPIs.

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would be classified according to the same system as in the production account. We show the major categories of the CPC 1.0 within the components of final consumption expenditure in Table 14.4.

14.41　Although the discussion in this chapter maintains a consistent classification of expenditure by product across all goods and services accounts, other functional classifications of expenditure have been developed for each institutional sector for specific purposes. The international standard versions of these classifications included in the *SNA 1993* comprise the Classification of Individual Consumption according to Purpose (COICOP), the Classification of the Purposes of Non-profit Institutions Serving Households (COPNI), the Classification of the Functions of Government (COFOG), and the Classification of the Purposes of Producers (COPP). The first column of Tables 14.4 and 14.5 is often compiled using data from household expenditure surveys. These data are collected using functional classifications such as COICOP, rather than product classifications. To facilitate constructing the cross-economy framework of the *SNA 1993* considered in this chapter, there is a concordance between the CPC and the COICOP.

14.42　*A hierarchy of household consumption aggregates.* It is worth noting that all household consumption

expenditures (that is, of the households institutional sector S.14) are individual expenditures, by definition. The following hierarchy of household consumption aggregates that are relevant to CPIs may be distinguished in the SNA:

P.41 Actual individual consumption, of which:

    D.63 Social transfers in kind (the individual consumption expenditure P.31 of general government S.13 and NPISHs S.15)

    P.31 Individual consumption expenditure, of which:

        P.311 Monetary consumption expenditure

        P.312 Financial intermediation services implicitly measured (FISIM)

        P.313 Imputed expenditure on owner-occupied housing services

        P.314 Other imputed individual consumption expenditure

The codes P.311, P.312, P.313 and P.314 do not exist in the *SNA 1993* but are introduced for convenience here. These four sub-categories of household consumption expenditures are separately identified in Tables 14.4 and 14.5. As already noted, D.63 is usually excluded from the expenditure coverage of CPIs.

14.43　It is worth noting the special treatment of financial services in the *SNA 1993*. FISIM comprises expenditures on those market services provided by financial institutions that are not separately distinguished from interest charges. Expenditures on financial services on which there is an explicit charge are already covered in P.311. Although FISIM P.312 requires an implicit measurement as the difference between a market interest rate and a reference rate, it is part of an observed interest payment and thus is not considered an imputed expenditure in the same sense as imputed rent P.313 and other imputed expenditure P.314.

14.44　Our item P.314, other imputed individual consumption, includes, besides households' production of goods for their own consumption, expenditures on goods and services that employers make on behalf of their employees as non-cash compensation. The SNA calls this item D.12, employers' social contributions, and considers it in the generation of income account. It is recognized as a component of the labour services price index, but is not customarily included in the CPI despite its dual role as an item of consumption (see paragraph 14.75 below).

14.45　*The expenditure aggregate of the consumer price index and the use of income account.* The detailed use of income accounts for institutional sectors can be assembled into a consolidated framework by choosing columns from Table 14.4 for each sector and displaying them together as in Table 14.5, which gives an economy-wide presentation of final consumption and saving. Table 14.5, for the total economy, shows individual consumption as comprising the individual consumption entries P.31 of the use of income accounts for households, NPISHs and the general government sector. It also aggregates the disposable income B.6 of all three. It shows separately the final collective consumption of government P.32. The account in Table 14.5 has been arranged specifically to show the *consumption* coverage

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Table 14.4   Use of income account with product detail for institutional units and sectors

Left columns (Uses) show detail of far right column (Resources); SNA 1993 items in bold refer to flows in goods and services, sector titles in italics indicate whether the column appears in the use of income account for that sector

Institutional unit ID: uuuuuuuu
Institutional sector code: S.nnnn

Uses							Resources
P.31 Individual consumption expenditure					**P.32 Collective consumption expenditure**	**P.3 Final consumption expenditure (total, purchasers' prices)**	**B.6** *Disposable income*
P.311 Monetary consumption expenditure	*P.312 Imputed expenditure on owner-occupied housing services*	*P.313 Financial intermediation services implicitly measured (FISIM)*	*P.314 Other individual consumption¹ expenditure of households*		*P.32 Collective consumption expenditure: general government S.13 only*		
CPC 0 Agriculture, forestry and fishery products			CPC 0 Agriculture, forestry and fishery products		CPC 0 Agriculture, forestry and fishery products	CPC 0 Agriculture, forestry and fishery products	
CPC 1 Ores and mineral; electricity, gas, and water			CPC 1 Ores and mineral; electricity, gas, and water		CPC 1 Ores and mineral; electricity, gas, and water	CPC 1 Ores and mineral; electricity, gas, and water	
CPC 2 Food products, beverages and tobacco; textiles, apparel and leather products			CPC 2 Food products, beverages and tobacco; textiles, apparel and leather products		CPC 2 Food products, beverages and tobacco; textiles, apparel and leather products	CPC 2 Food products, beverages and tobacco; textiles, apparel and leather products	
CPC 3 Other transportable goods, except metal products, machinery and equipment			CPC 3 Other transportable goods, except metal products, machinery and equipment		CPC 3 Other transportable goods, except metal products, machinery and equipment	CPC 3 Other transportable goods, except metal products, machinery and equipment	
CPC 4 Metal products, machinery and equipment			CPC 4 Metal products, machinery and equipment		CPC 4 Metal products, machinery and equipment	CPC 4 Metal products, machinery and equipment	
CPC 6 Distributive trade services; lodging; food and beverage serving services; transport services; and utilities distribution services			CPC 6 Distributive trade services; lodging; food and beverage serving services; transport services; and utilities distribution services		CPC 6 Distributive trade services; lodging; food and beverage serving services; transport services; and utilities distribution services	CPC 6 Distributive trade services; lodging; food and beverage serving services; transport services; and utilities distribution services	
CPC 7 Financial and related services; real estate services; and rental and leasing services			CPC 7 Financial and related services; real estate services; and rental and leasing services²		CPC 7 Financial and related services; real estate services; and rental and leasing services	CPC 7 Financial and related services; real estate services; and rental and leasing services	
CPC 8 Business and production services			CPC 8 Business and production services		CPC 8 Business and production services	CPC 8 Business and production services	
CPC 9 Community, social and personal services			CPC 9 Community, social and personal services		CPC 9 Community, social and personal services	CPC 9 Community, social and personal services	

D.8   Adjustment for the change in the net equity of households in pension funds

B.8   *Saving*

¹The "Other individual consumption of households" comprises D.12 "Employers' social contributions, consumption in-kind of goods and services supplied to households by their employers in lieu of cash wages, and consumption from the households' own production of goods". D.12 appears in the Generation of Income Account and is a factor in the discussion of the price index of labour services to employers. Among "Employers' social contributions" are provision of housing, transport, child care, medical insurance and services, and life insurance services. "Employers' social contributions" also include contributions to pension plans, which are not consumption except for a small part attributable to pension administration services. The residual part of pension contributions is an important component of household saving. ²In addition to the real estate, rental and leasing services of homeowners, the *SNA 1993* treats financial services consumption expenditure as the sum of measured and imputed components. Measured expenditures comprise explicit service charges levied by financial institutions for deposit, loan, advisory services and the like, while imputed expenditures reflect the income forgone because the household does not lend (keep deposits with a financial institution) or borrow at a reference rate. In principle, these imputed expenditures, as well as those for other imputed consumption, are of the same market-equivalent valued type as for owner-occupied housing services and could be covered in the CPI.

Table 14.5   Use of income account with product detail for the total economy

Institutional unit ID: uuuuuuu   *Institutional sector code: S.nnnn*   *Left columns show detail of far right column; SNA 1993 items in bold refer to flows in goods and services*

P.31 Individual consumption expenditure, Total economy S.1 (purchasers' prices), *comprising:*

P.31 Individual consumption expenditure, Household sector S.14

Consumer Price Index reference aggregate #1[2]

	P.311 Monetary consumption expenditure	P.313 Imputed expenditure on owner-occupied housing services	P.314 Other imputed individual consumption expenditure: households S.14	P.31 Individual consumption expenditure, general government S.13 and NPISH[1] S.15 sectors — D.63 Social transfers in kind	P.32 Collective consumption expenditure, general government sector S.13	P.32 Collective consumption expenditure, Total economy S.1 (purchasers' prices), *comprising:*	P.3 Final consumption expenditure, total economy S.1, *of which*
P.312 Financial intermediation services implicitly measured (FISIM)							
CPC 0 Agriculture, forestry and fishery products	CPC 0 Agriculture, forestry and fishery products			CPC 0 Agriculture, forestry and fishery products	CPC 0 Agriculture, forestry and fishery products	CPC 0 Agriculture, forestry and fishery products	CPC 0 Agriculture, forestry and fishery products
CPC 1 Ores and mineral; electricity, gas, and water	CPC 1 Ores and mineral; electricity, gas, and water			CPC 1 Ores and mineral; electricity, gas, and water	CPC 1 Ores and mineral; electricity, gas, and water	CPC 1 Ores and mineral; electricity, gas, and water	CPC 1 Ores and mineral; electricity, gas, and water
CPC 2 Food products, beverages and tobacco; textiles, apparel and leather products	CPC 2 Food products, beverages and tobacco; textiles, apparel and leather products			CPC 2 Food products, beverages and tobacco; textiles, apparel and leather products	CPC 2 Food products, beverages, tobacco; textiles, apparel, leather products	CPC 2 Food products, beverages, tobacco; textiles, apparel, leather products	CPC 2 Food products, beverages, tobacco; textiles, apparel, leather products
CPC 3 Other transportable goods, except metal products, machinery and equipment	CPC 3 Other transportable goods, except metal products, machinery and equipment			CPC 3 Other transportable goods, except metal products, machinery and equipment	CPC 3 Other transportable goods, except metal products, machinery and equipment	CPC 3 Other transportable goods, except metal products, machinery and equipment	CPC 3 Other transportable goods, except metal products, machinery and equipment
CPC 4 Metal products, machinery and equipment	CPC 4 Metal products, machinery and equipment			CPC 4 Metal products, machinery and equipment	CPC 4 Metal products, machinery and equipment	CPC 4 Metal products, machinery and equipment	CPC 4 Metal products, machinery and equipment
CPC 6 Distributive trade services; lodging; food and beverage serving services; transport services; and utilities distribution services	CPC 6 Distributive trade services; lodging; food and beverage serving services; transport services; and utilities distribution services			CPC 6 Distributive trade services; lodging; food and beverage serving services; transport services; and utilities distribution services	CPC 6 Distributive trade services; lodging; food and beverage serving services; transport services; and utilities distribution services	CPC 6 Distributive trade services; lodging; food and beverage serving services; transport services; and utilities distribution services	CPC 6 Distributive trade services; lodging; food and beverage serving services; transport services; and utilities distribution services
CPC 7 Financial and related services; real estate services; and rental and leasing services	CPC 7 Financial and related services; real estate services; and rental and leasing services	CPC 7 Financial and related services; real estate services; and rental and leasing services	CPC 7 Financial and related services; real estate services; and rental and leasing services	CPC 7 Financial and related services; real estate services; and rental and leasing services	CPC 7 Financial and related services; real estate services; and rental and leasing services	CPC 7 Financial and related services; real estate services; and rental and leasing services	CPC 7 Financial and related services; real estate services; and rental and leasing services
CPC 8 Business and production services	CPC 8 Business and production services			CPC 8 Business and production services	CPC 8 Business and production services	CPC 8 Business and production services	CPC 8 Business and production services
CPC 9 Community, social and personal services	CPC 9 Community, social and personal services			CPC 9 Community, social and personal services	CPC 9 Community, social and personal services	CPC 9 Community, social and personal services	CPC 9 Community, social and personal services

B.6 *Disposable income,* Total economy S.1, *with uses comprising:*

D.8   Adjustment for the change in the net equity of households S.14 in pension funds

B.8   *Saving, Total economy S.1*

[1] Non-profit institutions serving households. [2] P.313 Financial intermediation services implicitly measured (FISIM) are market services supplied to households by financial institutions and thus are included along with the monetary consumption expenditure of households. FISIM are in scope for inflation or transaction CPIs, for example. They are separately distinguished from non-FISIM monetary expenditures here because they require implicit measurement comparing a market interest rate with a reference rate. Other monetary expenditures are measured at least in principle by direct observation.

of the typical CPI, which comprises the first and second columns and is labelled *CPI reference aggregate #1*. This aggregate corresponds with the practice of most, but not all, countries and comprises, as shown in Table 14.5, the monetary (non-imputed) individual consumption expenditure of the household sector (P.311) plus the implicit rent paid by homeowners on their own residences (P.313). Box 14.3 contains further discussion on housing and durables in the CPI consumption expenditure aggregate.

Capital formation

14.46 Capital formation comprises: the accumulation of fixed tangible and intangible assets, such as equipment, structures and software; changes in inventories and work in progress; and acquisitions less disposals of valuables, such as works of art. These items are accounted for in the SNA capital account, which appears, with minor resorting, essentially as in Table 14.6 for each institutional unit. *Net lending (+)/net borrowing (−)* is the balancing item of the capital account, making the uses on the left, comprising net acquisitions of stocks of various tangible and intangible items, add up to the resources on the right, comprising the sources of income financing them. From our earlier discussion on institutional units and establishments, it would be easy to conclude that the smallest economic unit to which the capital account can apply is the institutional unit. It was asserted earlier that only institutional units maintain balance sheets and can monitor the stock variables that are the focus of this account. Nevertheless, the physical capital assets for which changes are tracked in the capital account can and should be compiled, if possible, at the establishment/LKAU. Such data are particularly useful for productivity analysis, even though complete capital accounts cannot be compiled at the establishment level.

14.47 *Product detail in the capital account*. As with the other goods and services-related accounts in the *SNA 1993*, the capital account's goods and services items, designated by the codes P.5 with extensions, can be expanded by product type. The account therefore can be rearranged to show details of goods and services as in Table 14.7, which, as Table 14.6, may pertain to an institutional unit, an institutional sector aggregate, or the total economy. For an institutional unit, Table 14.6 contains the core set of items in the report form of the typical capital formation survey for the national accounts. Our focus is on the CPI here, and thus on the version of the form that typically would be part of the package a respondent would fill out in a household expenditure survey. In addition to the Central Product Classification (CPC), version 1.0 shown here, the *SNA 1993*, Annex V contains a Non-financial assets

Table 14.6   Capital account

Items in bold refer to flows of goods and services

Institutional unit ID: uuuuuuuu	Institutional sector: S.*nnnnn*
Uses	Resources

P.5   Gross capital formation, *of which:*
  P.51   Gross fixed capital formation
    P.511   Acquisitions less disposals of tangible fixed assets
      P.5111   Acquisitions of new tangible fixed assets
      P.5112   Acquisitions of existing tangible fixed assets
      P.5113   Disposals of existing tangible fixed assets
    P.512   Acquisitions less disposals of intangible fixed assets
      P.5121   Acquisitions of new intangible fixed assets
      P.5122   Acquisitions of existing intangible fixed assets
      P.5123   Disposals of existing intangible fixed assets
    P.513   Additions to the value of non-produced non-financial assets
      P.5131   Major improvements to non-produced non-financial assets
      P.5132   Costs of ownership transfer on non-produced non-financial assets
  P.52   Change in inventories
  P.53   Acquisitions less disposals of valuables
	B.10.1 *Changes in net worth due to saving and capital transfers, of which:*

	B.8n *Saving, net* B.8 *Saving (gross, from use of income account)*
K.1 Consumption of fixed capital (−)	K.1 Consumption of fixed capital (−)

K.2   Acquisitions less disposals of non-produced non-financial assets
  K.21   Acquisitions less disposals of land and other tangible non-produced assets
  K.22 Acquisitions less disposals of intangible non-produced assets	

	D.9 Capital transfers receivable (+)
	  D.91 Investment grants
	  D.92 Other capital transfers receivable
	D.9 Capital transfers payable (−)
	  D.91 Capital taxes payable
	  D.91 Other capital transfers payable

B.9 *Net lending (+)/net borrowing (−)*	

Table 14.7 Capital account with product detail

Institutional unit ID: uuuuuuuu Institutional sector code: S.nnnn

SNA 1993 items in bold refer to flows in goods and services

P.5 Gross capital formation					**P.5 Gross capital formation**
P.51 Gross fixed capital formation			**P.52 Change in inventories**[1]	**P.53 Acquisitions less disposals of valuables**[2]	
P.511 Acquisitions less disposals of tangible fixed assets, of which:[3]	**P.512 Acquisitions less disposals of intangible fixed assets, of which:**[4]	**P.513 Additions to the value of non-produced non-financial assets, of which:**[5]			
CPC 0 Agriculture, forestry and fishery products			CPC 0 Agriculture, forestry and fishery products	CPC 0 Agriculture, forestry and fishery products	CPC 0 Agriculture, forestry and fishery products
			CPC 1 Ores and mineral; electricity, gas, and water	CPC 1 Ores and mineral; electricity, gas, and water	CPC 1 Ores and mineral; electricity, gas, and water
			CPC 2 Food products, beverages and tobacco; textiles, apparel and leather products	CPC 2 Food products, beverages and tobacco; textiles, apparel and leather products	CPC 2 Food products, beverages and tobacco; textiles, apparel and leather products
			CPC 3 Other transportable goods, except metal products, machinery and equipment	CPC 3 Other transportable goods, except metal products, machinery and equipment	CPC 3 Other transportable goods, except metal products, machinery and equipment
CPC 4 Metal products, machinery and equipment			CPC 4 Metal products, machinery and equipment	CPC 4 Metal products, machinery and equipment	CPC 4 Metal products, machinery and equipment
CPC 5 Intangible assets; land; constructions; construction services	CPC 5 Intangible assets; land; constructions; construction services		CPC 5 Intangible assets; land; constructions; construction services		CPC 5 Intangible assets; land; constructions; construction services

Of which:

P.511a Residential structures, Household sector S.14

P.511b Other capital formation in CPC 5

K.1 Consumption of fixed capital
K.2 Acquisitions less disposals of non-produced non-financial assets

B.9 *Net borrowing(−)/ net lending(+)*

[1] *SNA 1993* asset code AN.12 Inventories. Excludes intangible assets, land, and constructions. [2] *SNA 1993* asset code AN.13 Valuables. Excludes intangible assets, land, constructions, and construction services. [3] *SNA 1993* asset code AN.111 Tangible fixed assets. Excludes intangible assets, land, and construction services. [4] *SNA 1993* asset code AN.112 Intangible fixed assets. Excludes land, constructions, and construction services. [5] *SNA 1993* asset code AN.2 Non-produced assets. Excludes intangible assets, constructions, and construction services

classification identifying the specific tangible, intangible, produced, and non-produced fixed assets, as well as inventory and valuables items, recognized by the *SNA 1993*.

14.48 *The expenditure aggregate of the CPI and the capital account*. The CPI may be defined to include the household sector's final expenditure not only for consumption but also for capital formation. This brings into the CPI expenditure aggregate the purchase of new residential structures or expenditure on major improvements to existing residential structures. *Consumer price index expenditure aggregate #2* is defined as the monetary individual consumption expenditure of households P.311 in Table 14.5, which excludes all imputed expenditure, plus household expenditure on residential fixed capital formation shown as item *P.511a Residential structures, Household sector S.14* (shown in a box in Table 14.7).

External trade

14.49 The external account of goods and services is shown in Table 14.8. It contains the transactions of the non-resident institutional units sector – S.2 Rest of the world – with the five types of resident units taken together and determines the trade deficit (B.11) as imports (resources to rest of the world S.2) less exports (use or resources by the rest of the world). The external goods and services account generally is taken from the balance of payments, which uses adjusted merchandise trade information from the customs services for goods P.61 and P.71, and assembles services data on P.62 and P.72 from various sources. For further details, see International Monetary Fund: *Balance of payments manual* (fifth edition, 1993). Although the account of external goods and services is shown as an aggregate of the external transactions of all resident institutional units by the *SNA 1993*, it may be possible to disaggregate it to distinguish the external goods and services expenditures of institutional sectors, hence the institutional sector designation *S.1.nnnn* at the top of Table 14.8 to include this possibility. Our principal interest would be in the household sector S.14 and its subsectors S.14*nn*, as these would relate to the CPI.

14.50 *Product detail in the external account of goods and services*. As with the other accounts, the external goods and services account can be expanded to show product detail, as in Table 14.9. Regarding Table 14.9, the *SNA 1993* states (*SNA 1993*, paragraph 15.68) that imported goods should be valued at cost-insurance-freight (cif) at the level of detailed products. On the other hand, the *SNA 1993* requires that, in total, imports of goods be valued free-on-board (fob) at the border of the exporting country, thus excluding insurance and transport in a single adjustment to total imports of goods cif (*SNA 1993* paragraphs 14.36–14.41). That part of freight services on imports provided by non-residents is included in imports of transport services, and that part of insurance services provided on imports by non-residents is added to imports of insurance services. Transport and insurance services provided by residents on imports are included in exports of transport and insurance services. This rather roundabout approach is taken to imports by product because, as a practical matter, it may be difficult to obtain insurance and freight charges

on imports from customs administrative data systems at the product level of detail (see *SNA 1993*, paragraphs 14.40–14.41). Recent developments in computerized customs documentation have made the itemization of insurance and freight more straightforward, and the *SNA 1993* does also allow for the possibility of determining imports by product at their fob values, consistent with the aggregate valuation of imports. If trade data are collected by a survey of resident institutional units, the core elements of the report form for such a survey would be as given in Table 14.9.

14.51 *The export and import price indices and the external account of goods and services*. From the point of view of the residents of an economic territory, exports are a supply of goods and services to non-residents. The SNA, however, records exports from the non-resident's point of view, as a non-resident use of goods and services supplied by residents. Accordingly, the relevant valuation principle for exports determining the behaviour of the non-resident user is the purchasers' price. The SNA takes the purchasers' price to the non-resident user to be the fob price at the frontier of the resident supplier's economic territory or country.

14.52 From the resident's point of view, imports are a use of goods and services supplied by non-residents. The SNA, however, records international trade from the non-resident's point of view, as the supply of goods and services to residents by non-residents. Accordingly, the relevant valuation principle for imports determining the behaviour of the non-resident supplier is the basic price. The SNA takes the basic price to the non-resident supplier to be the fob price at the frontier of the non-resident supplier's country in the rest of the world.

The supply and use table

14.53 Arraying elements of resources and uses from the production account, use of income account, capital account, and external accounts of goods and services in a particular configuration, we can derive a format for the production portion of an analytical presentation of the data called a supply and use table (SUT). An SUT is shown in Table 14.10. It arrays various accounts relevant to monitoring developments in production and consumption within a country according to the supply and uses of goods and services.

14.54 In terms of the *SNA 1993* codes, the supply of goods and services comes from:

- resident establishments (arranged in industries) in the form of domestic output (P.1), given by Y in equations (14.1) and (14.2);
- the rest of the world as imports (P.7), given by M in equations (14.1) and (14.2), adjusted for trade and transport margins and taxes less subsidies on products (D.21–D.31), given by T in equations (14.1) and (14.2);

and the uses of goods and services are for:

- current inputs into production by resident producers (arranged in industries) in the form of intermediate consumption (P.2), given by Z in equations (14.1) and (14.2);

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Table 14.8   External account of goods and services

Resident institutional units classified into sectors S.1.nnnn with non-resident institutional units S.2;
SNA 1993 goods and services items shown in bold

Uses	Resources

P.6   Exports of goods and services
       P.61   Exports of goods
       P.62   Exports of services
	P.7 Imports of goods and services
	       P.71 Imports of goods
	       P.72 Imports of services

B.11 *External balance of goods and services*	

Table 14.9   External account of goods and services with product detail

Resident institutional units classified into sectors S.1.nnnn with non-resident institutional units S.2;
SNA 1993 goods and services items shown in bold

Uses	Resources

P.6   Exports of goods and services
       Export price index uses aggregate
       P.61   Exports of goods
              At fob values
	P.7 Imports of goods and services
	       Import price index supply aggregate
	       P.71 Imports of goods
	              At fob values, of which:
	              At cif values:[1]

CPC 0 Agriculture, forestry and fishery products CPC 1 Ores and mineral; electricity, gas, and water CPC 2 Food products, beverages and tobacco; textiles, apparel and leather products CPC 3 Other transportable goods, except metal products, machinery and equipment CPC 4 Metal products, machinery and equipment	CPC 0 Agriculture, forestry and fishery products CPC 1 Ores and mineral; electricity, gas, and water CPC 2 Food products, beverages and tobacco; textiles, apparel and leather products CPC 3 Other transportable goods, except metal products, machinery and equipment CPC 4 Metal products, machinery and equipment *Less: Adjustment to total imports of goods cif for insurance and freight provided by both residents and non-residents for delivery to the first resident recipient.*

P.62   Exports of services
CPC 5   Intangible assets; land; constructions; construction services[2]
CPC 6   Distributive trade services; lodging; food and beverage serving services; transport services; and utilities distribution services, *of which:*
 	
   • Distributive trade services; lodging; food and beverage serving services; transport services; and utilities distribution services; *except* transport services on imports and exports rendered by residents
 	
   • Transport services on imports and exports rendered by residents
 	
CPC 7   Financial and related services; real estate services; and rental and leasing services, *of which:*
 	
   • Financial and related services; real estate services; and rental and leasing services; *except* insurance services on imports rendered by residents
 	
   • Insurance services on imports rendered by residents
 	
CPC 8   Business and production services
CPC 9   Community, social and personal services
	P.72 Imports of services
	CPC 5 Intangible assets; land; constructions; construction services[2]
	CPC 6 Distributive trade services; lodging; food and beverage serving services; transport services; and utilities distribution services, *of which:*
	
	   • Distributive trade services; lodging; food and beverage serving services; transport services; and utilities distribution services; *except* transport services on imports rendered by non-residents
	
	   • Transport services on imports and exports rendered by non-residents
	
	CPC 7 Financial and related services; real estate services; and rental and leasing services, *of which:*
	
	   • Financial and related services; real estate services; and rental and leasing services; *except* insurance services on imports rendered by non-residents
	
	   • Insurance services on imports rendered by non-residents
	
	CPC 8 Business and production services
	CPC 9 Community, social and personal services

B.11 *External balance of goods and services*	

[1]The *SNA 1993* values imports fob, but it allows for the fact that while fob valuation by product would be consistent and preferred, compiling such data may be problematic at the product level of detail. Imports of goods cif by product may be all that are available because the insurance and freight data are often not separately compiled by product in customs systems (see *SNA 1993*, paragraph 15.68). Totals for these data may be obtained instead from resident and non-resident shippers in the process of compiling the balance of payments. Insurance and freight services provided by residents on imports are a services export. Regarding goods and services valuations in the import price and volume indices, see *MPI* in Tables 14.12 and 14.15, where it is explained that both fob and purchasers' price valuations are important in constructing the *MPI* as a deflator for imports fob. Imports at purchasers' prices would be imports cif plus import tariffs, as well as domestic insurance and freight for delivery to the first domestic owner. [2]Construction services only.

Table 14.10 The supply and use table (SUT)

Production account: double outlines and no shading; **Use of income account:** single outlines and no shading; **Capital account:** diagonal shading; **External account of goods and services:** vertical shading

Supply

	P.1 Output at basic prices of establishments producing for:			Transport and distribution margin adjustment[1]	D.21-D.31 Taxes less subsidies products[2]	Imports cif[3]	
	P.11 Market	P.12 Own use	P.13 Other non-market				

Product × Industry	Product × Industry	Product × Industry		+	*Goods (+)* / *Services (−)*	*Product × 1*	+	*Goods fob* / *Services*[6]	P.7 Imports fob	*Goods (+)*[5] / *Services (−)*	cif/fob adjustment[4]

P.11 Output at basic prices 1 × Industry = P.12 Output at basic prices 1 × Industry = P.13 Output at basic prices 1 × Industry

Use

	P.2 Intermediate consumption at purchasers' prices of establishments producing for:			P.31 Individual con-sumption	P.32 Collective con-sumption	P.5 Gross capital formation	P.6 Exports fob
	P.11 Market	P.12 Own use	P.13 Other non-market				

Product × Industry	Product × Industry	Product × Industry	+	*Product × 1*	*Product × 1*	+	*Product × 1*	+	*Product × 1*

B.1 Value added 1 × Industry + B.1 Value added 1 × Industry + B.1 Value added 1 × Industry

= = =

P.11 Output at basic prices 1 × Industry = P.12 Output at basic prices 1 × Industry = P.13 Output at basic prices 1 × Industry

[1] The sum of items in this column is zero. It appears in the SUT but does not appear in the *SNA 1993* sequence of accounts. This adjustment includes only transport, insurance, and distribution charges separately invoiced by resident establishments on goods produced by resident establishments. As a first stage in obtaining purchasers' price values, it thus adjusts the basic price value of output by product to include separately invoiced transport, insurance and distribution charges on goods. [2] Taxes and subsidies on products are shown in the *SNA 1993* allocation of primary income account for the general government institutional sector S.13, which derives the balancing item B.5 *Balance of primary incomes* (*SNA 1993*, Annex V, Table A.V.5). B.5 is B.2 Operating surplus plus D.2 Taxes on production and imports less D.3 Subsidies plus D.4 Property income (net). This account is the source of data for construction of this column in the SUT, when expanded to show product detail for the items D.21 Taxes on products and D.31 Subsidies on products. It includes taxes and subsidies on both domestic output and imports. [3] As noted elsewhere, the *SNA 1993* values goods imports cif at the product level of detail but fob in total. Thus, the *SNA 1993* presentation of goods imports in the supply matrix is the sum of P.7 Imports fob and the cif/fob adjustment on goods imports shown in Table 14.10. To simplify this presentation of the SUT and clarify the nature of the negative adjustment to services, we assume that insurance and freight provided on imports can be compiled by product and thus imports fob can be compiled by product. Insurance and freight provided on imports by residents are already included in the insurance and transport rows of the P.1 matrix. [4] The sum of items in this column is zero. It appears in the SUT but does not appear in any *SNA 1993* account. [5] Insurance and freight on imports of goods by product provided by both residents and non-residents. [6] Including insurance and freight on imports provided by non-residents. Insurance and freight provided on imports by residents are included in the insurance and transport rows of the P.1 matrix.

• final domestic consumption, including individual consumption by resident households, resident non-profit institutions serving households (NPISHs), and the government (P.31), and collective consumption by the government (P.32), given by, respectively, C and G in equations (14.1) and (14.2);

• capital formation by resident enterprises (P.5) (comprising fixed capital formation (P.51), inventory change (P.52), and acquisitions less disposals of valuables (P.53)), given by I in equations (14.1) and (14.2);

• export (P.6) and use by the rest of the world, given by X in equations (14.1) and (14.2).

14.55 Trade and transport margins do not appear in the standard sequence of accounts in the *SNA 1993* because these accounts are not shown with product detail. Although these margins are non-zero for individual products, they add up to zero in total because the amount added to the domestic supply of *goods* comes from the domestic supply of distribution, insurance and transport *services*. Margins are thus shown in Table 14.10 separately for margins on domestic production and imports (cif/fob adjustment), because the SUT displays product detail down the columns. In the aggregate, of course, these adjustments for trade and transport margins on domestic production and the cif/fob adjustment for imports cancel each other out.

14.56 The SUT is primarily a matrix of flows of goods and services designed to highlight the relationship between production and consumption, not between institutional units per se. For example, households may undertake production in unincorporated enterprises for which activity appears in the production for own final use part of the SUT, but also consume goods and services, as represented in individual consumption. The current production transactions of the establishments of all institutional units are grouped together and summarized in one part of the SUT, and the remaining transactions are summarized and organized in another part. Each institutional sector, including households (S.14), has its own SUT in principle. The SUT for the total economy (S.1) is the cell-by-cell sum of the institutional sector SUTs.

The consumer price index among major price indices

14.57 It is instructive at this point to associate the SUT with the component aggregates and matrices of the four major, headline price indices that are compiled by most countries. In so doing, we form a more precise impression of the central purpose of the major price indices in the overall economic statistical system represented by the *SNA 1993*. The four main price indices and their associated national accounts aggregates and matrices in the SUT are:

– producer price index (PPI): output of resident producers (P.1);

– consumer price index (CPI): final consumption of households (P.31) for CPI reference aggregate #1, *plus*

gross fixed capital formation of households (P.51) for CPI reference aggregate #2;

– export price index (XPI): exports (P.6);

– import price index (MPI): imports (P.7).

14.58 The location and coverage of these major price indicators as they directly apply to goods and services value aggregates in the national accounts are shown diagrammatically in Table 14.11. Chapter 15 characterizes a price index as a function of price relatives and weights, noting that, other than the formula for the index itself, the requisite features of the relatives and weights would be determined by the value aggregate. These factors are:

– what items to include in the index;

– how to determine the item prices;

– what transactions that involve these items to include in the index;

– from what source to draw the weights used in the selected index formula.

Based on our survey of the goods and services accounts of the *SNA 1993* culminating in the SUT, these particulars for each of the four major indices can summarized as in Table 14.12.

Scope of the expenditure aggregates of the consumer price index

14.59 As noted in paragraphs 14.6 and 14.7, there are two principal expenditure sub-aggregates of the total final expenditure of the households (S.14) institutional sector employed in most national CPIs that we can now see are transparently linked to the SNA:

• *CPI reference aggregate #1*, comprising the *consumption* items:

P.311 Monetary consumption expenditure (Table 14.5)
P.313 Financial intermediation services implicitly measured (FISIM) (Table 14.5)
P.312 Imputed expenditure on owner-occupied housing services (Table 14.5)

• *CPI reference aggregate #2*, comprising the *consumption* and *capital formation* items:

P.311 Monetary consumption expenditure (Table 14.5)
P.313 Financial intermediation services implicitly measured (FISIM) (Table 14.5)
P.511a Gross fixed capital formation in residential structures (Table 14.9)

14.60 Proponents of CPI reference aggregate #1 generally take a consumption or cost of living view of the CPI, seeing household welfare as determined by the flow of goods and services, including the services of residential structures that are owned wholly or in part by the occupants, that households consume. On this view, households' fixed capital formation, which is effectively limited to the purchase of residences for own use, is a business-related activity of unincorporated enterprises that households own and thus not in the scope of the CPI. The customary version of aggregate #1 excludes non-housing consumption from own production P.314. Although compensation in kind in the form of benefits

Table 14.11 Location and coverage of major price indices: Columns in the supply and use table

The effective coverage of the major indices is shown by shaded areas

Total supply

SNA 1993 transaction	P.1 Output, *of which, establishments producing principally*			Transport and distribution margin adjustment	Taxes *less* subsidies on domestic products	P.7 Imports, fob	Cif/fob adjustment	Taxes *less* subsidies on imports
	P.11 Market output	P.12 Output for own final use	P.13 Other non-market output			Imports at purchasers' prices		
PPI reference aggregate								
MPI reference aggregate								
Resources by product: Goods	*Product × Industry*	*Product × Industry*	*Product × Industry*	*Product × 1* +	*Product × 1*	*Product × 1*	*Product × 1*	*Product × 1*
Resources by product: Services				—				
Total resources				0				

Final uses

SNA 1993 transaction	P.31 Individual consumption				P.32 Collective consumption	P.5 Gross capital formation			P.6 Exports, fob	
SNA 1993 institutional sector	Households S.14			Government S.13 / NPISHs[1] S.15	Government S.13	Households S.14	All institutional sectors, except households		All institutional sectors	
Detailed expenditure categories	P.311 Monetary consumption / P.313 FISIM[2]	P.312 Imputed rent of owner-occupants	P.314 Other imputed individual consumption expenditure	D.36 Social transfers in kind		P.51 Gross fixed capital formation — P.511a Residential structures for own use / Other fixed capital formation	P.52 Inventories / P.53 valuables		Output (at basic prices) sold to non-residents	Taxes less subsidies on export products, transport to international shipment point
CPI reference aggregate #1										
CPI reference aggregate #2										
XPI reference aggregate										
Expenditures by product: Goods	*Product × 1*	*Product × 1*	*Product × 1*	*Product × 1*	*Product × 1*	*Product × 1*	*Product × 1*	*Product × 1*	*Product × 1*	*Product × 1*
Expenditures by product: Services										
Total expenditure										

[1]Non-profit institutions serving households. [2]Financial intermediation services implicitly measured.

Table 14.12   Definition of scope, price relatives, coverage and weights for major price indices

Index	Items to include	Price determination	Transactions coverage	Sources of weights
PPI	All types of domestically produced or processed goods and services that are valued at market prices	Basic prices, determined for goods as the date when available for sale (available for change of ownership) or service price when service rendered	Output of resident enterprises, comprising sales plus change in finished goods inventories for goods, and sales for services	The product by industry matrices of Market output P.11 and Output for own final use P.12 in the expanded Industry production account and the supply and use table (SUT)
CPI	*Reference expenditure aggregate #1:* All types of goods and services purchased explicitly or implicitly by households for individual consumption *Reference expenditure aggregate #2:* All types of goods and services purchased explicitly by households for individual consumption, plus all types of goods and services purchased explicitly by households for residential capital formation	Purchasers' prices, determined for goods on the change of ownership date and for services when used, including taxes on products, excluding subsidies on products, and including transport and distribution margins	*Reference expenditure aggregate #1:* Consumption expenditures of the Households sector S.13 of institutional units, excluding consumption from own production except for imputed expenditures for rental of owner-occupied dwellings *Reference expenditure aggregate #2:* Reference expenditure aggregate #1, less imputed expenditures for rental of owner-occupied dwellings, plus net acquisition of or major improvements in residential housing	*Reference expenditure aggregate #1:* The product column of the CPI consumption sub-aggregate of Individual consumption P.31 of the Household sector S.13 in the expanded Use of Income account and in the SUT *Reference expenditure aggregate #2:* The product column of the monetary consumption sub-aggregate of individual consumption P.31 of the Household sector S.13 in the expanded Use of income account plus the product column of acquisitions less disposals of fixed assets P.511 for residential housing
XPI	All types of transportable goods and services purchased by non-residents from residents. Goods exported without change of ownership for significant processing by non-residents and subsequent re-import are included	Purchasers' prices at the national frontier of the exporting country (fob), including export taxes and excluding export subsidies, and including transport and distribution margins from the production location to the national frontier	All transportable goods and services produced or processed by residents and purchased by non-residents except goods in transit or goods exported and minimally processed by non-residents for re-import	The product column of Exports P.6 in the expanded External account of goods and services and the SUT
MPI	All types of transportable goods and services purchased by residents from non-residents. Goods imported without change of ownership for significant processing by residents and subsequent re-export are included	Basic prices at the national frontier of the exporting country (fob), excluding import taxes and including import subsidies, and excluding transport and distribution margins from the production location to the national frontier[1]	All transportable goods and services produced or processed by non-residents and purchased by residents except goods in transit or goods imported and minimally processed by residents for re-export	The product column of Imports P.7 in the expanded External account of goods and services and the SUT

PPI = producer price index; CPI = consumer price index; XPI = export price index; MPI = import price index.

[1]In defining the import price index, however, the price index maker would, in fact, first consider an economic input price index valuing imported goods and services at the purchasers' price payable by their first resident owner. The import price index would be obtained by adjusting (multiplying) the import purchasers' price index by a ''markdown'' index tracking the movement in the ratio of imports fob to imports at purchasers' prices. This is required for it to be properly matched in valuation with imports fob and yield the conceptually correct import volume index when used as an imports fob deflator.

provided by the employer is an important part of this item, households often are only vaguely aware of its value, since the employer actually makes the payments to the providers of the benefits. An argument nevertheless could be made for including this item, as households sometimes are able to exercise control over how this part of their compensation income is spent.

14.61 Proponents of CPI reference aggregate #2 generally take a transactions or inflation view of the CPI, tailoring the index to measuring the rate of change in the prices of an expenditure aggregate broadly covering the monetary final expenditures that households make on goods and services, including their capital formation in residential structures via purchase of their own dwellings and the major improvements they make to them.

14.62 Both CPI concepts are useful. The cost of living view provides a price index whose dual is the volume of household consumption. The inflation view provides a price index whose dual is the volume of households' final monetary purchases, which represent the demand pressure they put on the markets in which they participate. Table 14.11 illustrates the coverage of both indices.

The consumer price index as a measure of inflation in market transactions

14.63 Central banks take an interest in the major price indices, particularly if they are implementing a monetary policy that targets inflation. Indeed, reference aggregate #2 has been seen as a better measure of change in the prices of actual transactions in goods and services than CPIs based on reference aggregate #1, which gives substantial weight to the imputed rent of owner-occupied housing.

14.64 Both reference aggregates for the CPI are an important component of total final expenditure and GDP in virtually all countries, but the total value of transactions in goods and services also includes intermediate consumption, so as an inflation index for total goods and services transactions, the CPI's coverage is rather limited under either definition #1 or #2 compared with, for example, the PPI, which covers, in principle, total output. Progress in extending the industry coverage of the PPI to cover all output-producing activities, services in particular, has, however, proceeded slowly owing to the technical difficulty of specifying service products and measuring the associated prices. The combination of the PPI, covering output, and the import price index provides a price index for total market supply, and is seen by at least one monetary authority as a useful inflation measure. Another central bank targets the total domestic supply price index, which is based on total supply less exports (that is, covering the aggregate comprising output plus imports minus exports).

14.65 The CPI's purchasers' price valuation principle also includes taxes less subsidies on products, which may not be desired in an inflation indicator for underlying price change. Nevertheless, the CPI is the most widely available macroeconomic price statistic, and may in many countries be the only available option for inflation measurement. Monetary authorities also may find the CPI the most socially acceptable inflation target precisely because of its focus on households.

Treatment of cross-border shopping in the consumer price index

14.66 Exports P.6 are not an expenditure of any resident institutional unit and thus would not be the focus of a price index covering its expenditure. By implication, they would not appear in any CPI expenditure aggregate. Imports are, however, an expenditure of resident units and it is often relevant to consider the importance of imports in the expenditure aggregates of such units. In many countries, imports acquired by households directly through cross-border shopping are a significant fraction of household consumption expenditure.

14.67 Of particular note here is that imported goods P.71 and services P.72 in Table 14.8 for the household sector would contain only the direct expenditures of households on goods and services secured from non-residents, that is, in cross-border shopping. This should include purchases of transportable goods and services by households from non-resident suppliers through all means, including in person, by mail order and through the Internet. These expenditures in transactions with non-residents are already covered in households' individual consumption P.31 and capital formation P.5, so the purpose of identifying imports P.7 in the context of the CPI is to identify the importance of transactions with non-residents in the final expenditure aggregates of households and that part of those aggregates covered by the CPI expenditure aggregate.

14.68 Note that under both CPI reference aggregates #1 and #2 we would include expenditures on consumption goods and services provided by non-residents to resident households as the imported component of Individual consumption P.31. To assess the importance of imports when considering CPI reference expenditure aggregate #2, we also would include households' Fixed capital formation P.51 expenditures on imported transportable goods such as building materials for residences, as well as residential construction services provided by non-residents.

Other price indicators in the national accounts

Price indices for total supply

14.69 Consistent with our earlier discussion of the coverage of the PPI, we define total market-valued output as the sum of market output P.11 and output for own final use P.12. Total output P.1 is the sum of market-valued output and other non-market output P.13. Total supply at basic prices is the sum of output and imports P.7. Mark-up adjustments at the product level for trade and transport margins on domestic production, insurance and freight on imports, and taxes D.21 less subsidies D.31 on products would be added to total supply at basic prices to produce total supply at purchasers' prices.

14.70 In decomposing total supply into price and volume components, the total supply price index (SPI) at basic prices can be seen to be a weighted mean of the total output price index YPI and the import price index MPI. The YPI comprises in turn the PPI and an implicit

deflator index (IDI) for other non-market output. To obtain the price index for total supply at purchasers' prices, the SPI would be multiplied by an index of the total mark-up for trade, insurance, and transport margins, and taxes net of subsidies on products. The margins only matter when developing supply price indices at purchasers' prices for individual products and product sub-aggregates. For all products, they cancel out, leaving only taxes less subsides on products contributing to the total mark-up on total supply at basic prices. Total supply price indices at product levels of detail are useful in compiling and reconciling discrepancies in supply and use tables expressed in volume terms. In addition, they are employed in producing industry price indices for intermediate consumption P.2, which are useful for compiling gross domestic product (GDP) volume measures from the production approach. Although principally used as a compilation aid and in deflation of value added at basic prices via the double deflation approach (see paragraphs 14.71 and 14.73), supply price indices could also serve as analytical indicators in their own right because of their coverage of all goods and services transactions in the economy relating to production and external trade. As such, they may be useful as indicators for the analysis and evaluation of economic policy, where broad coverage of transactions is required, for example in formulating monetary policy.

Price indices for intermediate consumption

14.71   In considering intermediate consumption price indices (IPIs) for the total economy and for industry, the weights correspond to a column-wise reading of the intermediate consumption part of the SUT's use matrix, which is derived from Table 14.2 and shown in Table 14.10 as the region labelled P.2. Because the various margins on basic prices inherent in prevailing purchasers' prices may vary from user industry to user industry, the ideal sources for purchasers' prices for intermediate consumption price indices would be enterprise surveys. Unfortunately, such surveys are generally

burdensome and expensive. Instead, as noted in the discussion above on price indices for total supply, the price index of intermediate consumption by industry can be derived from detailed product components of the SPI, which will result in indices of acceptable accuracy if the variation in the total tax, subsidy, transport and distribution margin is not too great from industry to industry within product class. For the total economy, the price index of intermediate consumption is obtained as a weighted average of industries' intermediate input price indices, where the weights are the share of each industry's intermediate consumption in the total intermediate consumption in the economy.

Price indices for final uses

14.72   The price indices for final use comprise deflators for individual consumption P.31, collective consumption P.32, gross fixed capital formation P.51, change in inventories P.52, acquisitions less disposals of valuables P.53 and exports P.6. Of the major price indices discussed above, the CPI is the principal source of detailed (product level) information for P.31, while the PPI is a significant source of detailed information for P.51 and the principal source for the finished goods component of P.52. When the CPI is defined on the basis of CPI reference expenditure aggregate #2, the CPI could also be the source of data on capital formation in residential structures. The SPI may be the principal source for the input inventories component of P.52 in the absence of a detailed survey of the purchase price of intermediate inputs, and the XPI is the deflator for P.6. The SPI can serve, as well, as a source of detailed product information for P.32, P.51 and P.53. We will designate the deflator for total final uses as the final uses price index (FPI), which would be computed as a weighted mean (formula to be determined) of the component indices just discussed.

Price indices for gross domestic product

14.73   As noted above in the discussion of the SPI and the intermediate consumption price index, the

Table 14.13   Generation of income account for establishment, institutional unit or institutional sector

SNA 1993 goods and services items shown in bold

Uses	Resources
D.1 **Compensation of employees**	B.1 *Value added*[1]
D.11 **Wages and salaries**	
D.12 **Employers' social contributions**	
D.121 **Employers' actual social contributions**	
D.122 **Employers' imputed social contributions**	
D.2 Taxes on production and imports	
D.29 Other taxes on production[2]	
D.3 Subsidies	
D.39 Other subsidies on production $(-)$[3]	
B.2 *Operating surplus*[4]	

[1]From the production account. [2]Taxes on production unrelated to products. [3]Subsidies on production unrelated to products. [4]Balancing item of the generation of income account.

GDP price index can be compiled in two ways, corresponding to the two goods and services methods of compiling GDP: the production approach and the expenditure approach. Recall that the production approach derives from the definition of value added implicit in equation (14.2), as the difference between output P.1 (at basic prices) and intermediate consumption P.2 (at purchasers' prices). The *SNA 1993* recommends the use of double deflation for value added, by which output at basic prices Y is deflated by all the items YPI to obtain output volume, and intermediate purchases are deflated by an intermediate purchases price index to obtain intermediate input volume. Real value added is then computed as the difference between output volume and intermediate input volume (see *SNA 1993*, Chapter XVI). This operation is equivalent to deflating value added in current prices with a double deflation-type price index having a positive weight on the YPI and a negative weight on the IPI. In the usual case just described, we have the value added deflator as a Paasche index of the output price index $YPI^{s,t}$ and the intermediate input price index $IPI^{s,t}$, where the weight on the $IPI^{s,t}$ is

$$w_I^t = \frac{-\text{P.2}^t}{\text{P.1}^t - \text{P.2}^t}$$

and the weight on the $YPI^{s,t}$ is $1 - w_I^t$. The corresponding volume index has the Laspeyres or "constant price" form, which is equivalent to the double deflation measure of the volume of real value added divided by current price value added in period s. The total value added at current basic prices divided by real value added, obtained via double deflation, yields the implicit deflator for value added at basic prices. Finally, the GDP deflator at purchasers' prices is the value added price index (at basic prices for output and purchasers' prices for intermediate input) multiplied by the index of the mark-up on value added of output taxes less output subsidies on products.

14.74 Alternatively, the final expenditure deflator FPI may be combined with the MPI using a double deflation-type approach. GDP volume is calculated from expenditure data by deflating imports P.7 by the MPI, and subtracting the result from the volume of final uses, calculated by deflating final uses by the FPI. The implicit GDP deflator would be the ratio of GDP at current prices to GDP volume so calculated. The aggregate index of GDP volume and the aggregate index of real value added should agree with one another, as should, by implication, the implicit GDP deflator calculated from the two approaches.

Price indices for labour services

14.75 Value added appears first in the production account, calculated as the balancing item between output and intermediate consumption. This margin is used to pay for, among other things, labour services. The *SNA 1993* provides for the income components comprising value added in the generation of income

account, shown in Table 14.13. The largest of the income components itemized in this account is compensation of employees D.1, comprising wages and salaries D.11 and employers' social contributions D.12. D.1 represents a value aggregate for a flow of labour services and is thus susceptible to decomposition into price and volume components. Table 14.14 shows the same account expanded by type of labour service (occupation) for an establishment or industry. The price index for labour services (LPI) measures developments in total compensation, by occupation, within industry. The price of labour services in total compensation terms is of particular interest when compared with the GDP deflator, which indicates the relative purchasing power of labour compensation in terms of production for final consumption. This comparison is useful in assessing cost-push pressures on output prices and as an input into compiling measures of the productivity of labour. A second useful comparison is between the wages and salaries sub-index of the LPI and the CPI. The ratio of the LPI to the CPI indicates the purchasing power of wages in terms of consumption goods and services, and tracks the material welfare, particularly of the employees subsector S.143 of the household institutional sector S.14 (see Box 14.1 on page 238). In the LPI, the price of labour services comprises all the components of compensation of employees, including employers' social contributions (benefits), as well as wages and salaries. The wages and salaries sub-index of the LPI would be another example of a price index adjusted by a mark-up index. Analogously with the price index for total supply at purchasers' prices or for GDP by production in Table 14.10, the LPI would be adjusted in this case by a "markdown index", deducting employers' social contributions.

Framework for a system of price statistics for goods and services

14.76 To summarize this overview of the main price indicators and the national accounts, Table 14.15 shows in tabular form the price indices needed for the value aggregates in the national accounts and their relation to the four main price indicators. Indices that are functions of two other indices are shown with the notation

$$f(I_1, I_2; w)$$

where f is an index formula, I_1 and I_2 are price indices, w is the weight of the second index, with the weight of the first index understood to be $1-w$. For example, if f is the Laspeyres formula, then the output price index (YPI) would be calculated by making the following substitutions: $P_L^{s,t} = YPI^{s,t}$ $r_1^{s,t} = PPI^{s,t}$, $w_1^s = 1 - w_D^s$, $r_2^{s,t} = IDI^{s,t}$, $w_2^s = w_D^s$. f could also be chosen as a Paasche formula (with the same substitutions except for change in the time superscript on the weights $w_1^t = 1 - w_D^t$ and $w_2^t = w_D^t$), Fisher ideal formula, or other index formula.

Table 14.14 Generation of income account for establishment and industry with labour services (occupational[1]) detail

Establishment ID: eeeeeeee

Activity/Industry code (ISIC): aaaa
Market status: P.1n

SNA 1993 goods and services items shown in bold

Institutional unit ID: uuuuuuuu
Institutional sector code: S.nnnnn

Uses	Resources
D.11 Wages and salaries	B.1 *Value added*[2]
1: Legislators, senior officials and managers	
2: Professionals	
3: Technicians and associate professionals	
4: Clerks	
5: Service workers and shop and market sales workers	
6: Skilled agricultural and fishery workers	
7: Craft and related trades workers	
8: Plant and machine operators and assemblers	
9: Elementary occupations	
0: Armed forces	
D.12 Employers' social contributions	
1: Legislators, senior officials and managers	
2: Professionals	
3: Technicians and associate professionals	
4: Clerks	
5: Service workers and shop and market sales workers	
6: Skilled agricultural and fishery workers	
7: Craft and related trades workers	
8: Plant and machine operators and assemblers	
9: Elementary occupations	
0: Armed forces	
D.1 Compensation of employees	
1: Legislators, senior officials and managers	
2: Professionals	
3: Technicians and associate professionals	
4: Clerks	
5: Service workers and shop and market sales workers	
6: Skilled agricultural and fishery workers	
7: Craft and related trades workers	
8: Plant and machine operators and assemblers	
9: Elementary occupations	
0: Armed forces	
D.2 Taxes on production and imports	
D.29 Other taxes on production	
D.3 Subsidies (−)	
D.39 Other subsidies on production	
B.2 *Operating surplus*[3]	

[1]Showing major groups of ILO: *International Standard Classification of Occupations 1988* (ISCO-88) (Geneva, 1990). [2]From the production account. [3]Balancing item of the generation of income account.

International comparisons of expenditure on goods and services

14.77 The main price statistics discussed thus far trace price developments of goods and services through time. Purchasing power parities (PPPs) compare price levels between different countries or geographical areas for a given accounting period and are generally used to eliminate the effect of prices in different currency units when comparing the levels of GDP between two countries or areas. The price relatives in bilateral PPPs comprise the ratios of the local currency prices of identical goods and services between the two countries or areas. The weights are proportional to the shares of these items in expenditure on GDP within the two countries or areas. The sources of price relatives are the same as those for the final uses GDP deflator, and the weights are simply the total final uses, net of imports fob, by product. In order to ensure that the PPP between area A and area B is the reciprocal of the PPP between B and A, bilateral PPPs need to be computed using symmetric index numbers such as the Fisher.

14.78 A matrix of bilateral PPPs provides a means of making not only direct bilateral comparisons, but also bilateral comparisons between any two areas as the product of a sequence of bilateral PPPs through any set of intervening areas, beginning with the first area and ending with the second. In order to ensure the consistency of such multilateral comparisons – for example, that a chain beginning with a given area and ending with the same area produces a PPP of unity – bilateral PPPs are adjusted to produce a transitive set of comparisons.

14.79 The four main index series dealt with in this chapter are related to PPPs because the prices collected for the CPI, PPI, XPI and MPI, in addition to their use in these temporal indices and in the temporal GDP price index, can also be used in international comparisons of expenditures on consumption, capital formation and trade. See Annex 4 on the International Comparison Program for further details on PPPs.

Table 14.15 A framework for price statistics

SNA 1993 aggregate	SNA 1993 transaction codes[1]	Valuation and needed detail	SNA 1993 source account	Price index[2]	Derivation from other price indices
			Supply		
Market-valued output	**P.11 + P.12**	**Basic prices, product by industry**	**Production account with industry and product detail, total economy S.1**	**Producer price index (PPI)**	
Other non-market output[3]	P.13	Basic prices (cost of production), product by industry	Production account with industry and product detail, total economy S.1	Implicit deflator for other non-market output (IDI)	Derived from volume indicator
Total output	P.1 = P.11 + P.12 + P.13	Basic prices, by product	Production account with industry and product detail, total economy S.1	Output price index (YPI)	$YPI = f(PPI, IDI; w_m), w_m = \dfrac{P.13}{P.1}$
Imports	**P.7**	**Basic prices (goods fob frontier of exporting country, including the freight and insurance on imports provided by non-residents), by product**	**External transactions in goods and services account with product detail, total economy S.1**	**Import price index (MPI), comprising an import purchasers' price index multiplied by an fob/purchasers' price markdown index**	
Total supply, basic prices	P.1 + P.7	Basic prices, by product	Supply and use table, total economy S.1	Supply price index (SPI)	$SPI = f(MPI, YPI; w_y), w_y = \dfrac{P.1}{P.1+P.7}$
Total domestic supply	P.1 + P.7 − P.6	Basic prices, by product (P.1 and P.7); purchasers' prices (P.6 exports fob, see "Uses" entry below)	Supply and use table, total economy S.1	Domestic supply price index (DSPI)	$SPI = f(MPI, YPI, XPI; w_y, -w_x),$ $w_y = \dfrac{P.1}{P.1+P.7-P.6}, w_x = \dfrac{P.6}{P.1+P.7-P.6}$
Domestic trade, insurance, and transport margin adjustment		Basic prices, for services provided for transport and distribution within national frontiers, by product	Supply and use table, total economy S.1	Supply mark-up index (SMI)	$SMI = \dfrac{\dfrac{P.1^t+P.7^t+D.21^t-D.31^t}{P.1^t+P.7^t}}{\dfrac{P.1^s+P.7^s+D.21^s-D.31^s}{P.1^s+P.7^s}}$
Freight and insurance on imports adjustment		Basic prices (for services provided from exporter frontier to domestic frontier, regardless of residency of provider), by product	Supply and use table, total economy S.1		(in the aggregate). Product-level total output mark-up indices would also include trade and transport margins in the numerator of the above expression
Taxes less subsidies on products	D.21 − D.31	Payable, by product	Allocation of primary income account, general government sector S.13		
Total supply, purchasers' prices	P.11 + P.12 + P.7 + D.21 − D.31	Purchasers' prices			$SPI \times SMI$

Uses

		Prices	Uses	Index	Notes
Intermediate consumption	P.2	Purchasers' prices, products by industries	Production account with product and industry detail, total economy S.1	*Intermediate consumption price index (IPI)*	Usually incorporates product-level information from the total supply price index at purchasers' prices
Individual consumption	P.31	Purchasers' prices, by product	Use of income account with product detail, total economy S.1	*Household consumption price index (HPI)*	Incorporates the CPI, and may incorporate product-level information from the CPI and PPI regarding goods and services produced from own consumption and provided to individuals by NPISHs and general government
Household sector S.14	**P.31, except imputed consumption and consumption from production for own final use, but including imputed rent of home-owners**	**Purchasers' prices, by product**	**Use of income account with product detail, household sector S.14, with special sub-classification of P.31**	***Consumer price index (CPI) and other sub-indices as needed***	
Collective consumption	P.32	Purchasers' prices, by product	Use of income account with product detail, general government sector S.13	*Government price index (GPI)*	*May incorporate product indices from the **CPI** and **PPI***
Gross fixed capital formation	P.51	Purchasers' prices, by product	Capital account with product detail, total economy S.1	*Fixed capital formation price index (KPI)*	*May incorporate product indices from the **PPI***
Change in inventories	P.52	Purchasers' prices, by product	Capital account with product detail, total economy S.1	*Inventory price index (NPI)*	*Price index of inventory stocks*
Acquisitions less disposals of valuables	P.53	Purchasers' prices, by product	Capital account with product detail, total economy S.1	*Valuables price index (VPI)*	*Price index of valuables stocks*
Exports	**P.6**	**Purchasers' prices (fob domestic frontier), by product**	**External transactions in goods and services account with product detail, total economy S.1**	***Export price index (XPI)***	
Total final uses	P.3 + P.5 + P.6	Purchasers' prices, by product	Supply and use table, total economy S.1	*Total uses price index (FPI)*	$FPI = f(HPI, GPI, KPI, NPI, VPI, XPI, \bar{w})$ where[4] $\bar{w} = [w_G, w_K, w_N, w_V, w_X]^3$ and $$w_G = \frac{P.32}{P.3+P.4+P.5+P.6},$$ $$w_K = \frac{P.51}{P.3+P.4+P.5+P.6},$$ $$w_N = \frac{P.52}{P.3+P.4+P.5+P.6},$$ $$w_V = \frac{P.53}{P.3+P.4+P.5+P.6},$$ $$w_X = \frac{P.6}{P.3+P.4+P.5+P.6}$$

Table 14.15 A framework for price statistics (*contd.*)

SNA 1993 aggregate	SNA 1993 transaction codes[1]	Valuation and needed detail	SNA 1993 source account	Price index[2]	Derivation from other price indices
			Gross domestic product		
Gross domestic product	GDP = P.3 + P.5 + P.6 − P.7, or GDP = P.1 − P.2 + D.21 − D.31	By product when assembled from final consumption net of imports By industry when assembled from value added at basic prices, with industry and total value added price indices adjusted by a mark-up factor for taxes net of subsidies on products	Supply and use table, total economy S.1	*GDP deflator*	$GDP\ deflator = f(FPI, MPI; w_M),$ $= SMI^* \times f(SPI, IPI; w_I)$ where[5] $w_M = \dfrac{-P.7}{GDP}$ $w_I = \dfrac{-P.2^4}{GDP}$ $SMI^* = \dfrac{\dfrac{P.1^t - P.2^t + D.21^t - D.31^t}{P.1^t - P.2^t}}{\dfrac{P.1^s - P.2^s + D.21^s - D.31^s}{P.1^s - P.2^s}}$ (in the aggregate) Industry-level value added mark-up indices *SMI** would include the total trade and transport margins on output in the numerator
Compensation of employees	D.1	By industry and occupation	Generation of income account, total economy S.1	*Employment cost index*	

[1]P.11 = market output, P.12 = output for own final use, D.21 = taxes on products, and D.31 = subsidies on products. [2]The four major price indices are shown in bold. [3]This category comprises public services output provided free of charge or at economically insignificant prices by general government and non-profit institutions serving households (NPISHs). This output is valued at cost because it has no market comparator. A price index cannot be directly constructed for this aggregate because there are no economically significant prices for other non-market output. The implicit deflator for other non-market output P.13 is derived by dividing a directly compiled volume indicator into the value of other non-market output. [4]Unlike our other aggregations of indices that involve the combination of two component indices, we show the FPI as a simultaneous aggregation of six price indices for the components of final uses. Again, *f* can be any of the indices introduced in Chapters 1 and 15, with the weight of the first item, here of individual consumption P.31, determined as one minus the rest of the weights, and the price relatives given by the list of index arguments. [5]The negative weight of the second index argument of both of these formulae for GDP is an indication that they represent a "double deflation-type" price index (see *SNA 1993*, Chapter XVI, Section E).