CONCEPTS AND SCOPE

3

Introduction

3.1 The purpose of this chapter is to define and clarify the basic concepts of price and consumption used in a consumer price index (CPI) and to explain the scope of the index. While the general purpose of a *consumer* price index is to measure changes in the prices of consumption goods and services, the concept of ''consumption'' is an imprecise one that can be interpreted in several different ways, each of which may lead to a different CPI. The governmental agency or statistical office responsible for compiling a CPI also has to decide whether the index is meant to cover all consumers, i.e., all households, or to be restricted to a particular group of households. The precise scope of a CPI is inevitably influenced by what is intended, or believed, to be the main use of the index. Statistical offices should, however, bear in mind that CPIs are widely used as measures of general inflation, even though they may not have been designed for this purpose.

3.2 Consumption is an activity in which persons, acting either individually or collectively, use goods or services to satisfy their needs and wants. In economics, no attempt is made to observe and record such activities directly. Instead, consumption is measured either by the value of the goods and services wholly or partly used up in some period, or by the value of the goods and services that are purchased, or otherwise acquired, for purposes of consumption.

3.3 A consumer price index can have two different meanings, as ''consumer'' may refer either to a type of economic unit, typically a person or a household, or to a certain type of good or service. To avoid confusion, the term ''consumer'' will, so far as possible, be reserved here for persons or households, while so-called ''consumer'' goods will be described as ''consumption'' goods. *A consumption good or service is defined as one that members of households use, directly or indirectly, to satisfy their own personal needs and wants*. By definition, consumption goods or services provide *utility*. Utility is simply the generic, technical term preferred by economists for the satisfaction, benefit or welfare that people derive from consumption goods or services.

3.4 A CPI is generally understood to be a price index that measures changes in the prices of consumption goods and services acquired, or used, by households. As explained in Chapter 14, more broadly based price indices can be defined whose scope extends well beyond consumption goods and services, but a CPI is deliberately focused on household consumption. It is, however, possible to define a CPI that includes the prices of physical assets such as land or dwellings purchased by households. In the case of owner-occupied dwellings, a key issue is whether to include in the CPI the imputed rents for the flows of housing services provided by the dwellings, or alternatively whether to include the prices of the dwellings themselves in the index (notwithstanding the fact that they are treated as fixed assets and not consumption goods in the system of national accounts (SNA)). Views differ on this issue. In any case, purchases of financial assets, such as bonds or shares, are excluded because financial assets are not goods or services of any kind and are not used to satisfy the personal needs or wants of household members. Financial transactions do not change wealth as one type of financial asset is simply exchanged for another type of financial asset. For example, when securities are purchased, money is exchanged for a bond or share; or alternatively, when a debt is incurred, money is received in exchange for the creation of a liability.

3.5 Although, by definition, a CPI is confined to the prices of goods and services consumed by households, it does not necessarily follow that CPIs have to cover all households or all the goods and services they consume. For example, it might be decided to exclude publicly provided goods which households do not pay for. Many decisions have to be taken about the precise scope of a CPI even though the general purpose of the index may be determined. These issues are explored in this and the following chapter.

Alternative consumption aggregates

3.6 As already noted, the concept of consumption is not a precise one and may be interpreted in different ways. In this section, a hierarchy of different consumption concepts and aggregates is examined.

3.7 Households may acquire goods and services for purposes of consumption in four main ways:

– they may purchase them in monetary transactions;
– they may produce them themselves for their own consumption;
– they may receive them as payments in kind through barter transactions, particularly as remuneration in kind for work done;
– they may receive them as free gifts, or transfers, from other economic units.

3.8 The broadest concept of consumption for CPI purposes would be a price index embracing all four categories of consumption goods and services listed above. This set of consumption goods and services may

be described as *total acquisitions*. Total acquisitions are equivalent to the total actual individual consumption of households as defined in the SNA (see Chapter 14). It should be noted that total acquisitions constitute a broader concept of consumption than total consumption expenditures.

Acquisitions and expenditures

3.9 Expenditures are made by the economic units who pay for the goods and services: in other words, who bear the costs. However, many of the goods and services consumed by households are financed and paid for by government units or non-profit institutions. They are mostly services such as education, health, housing and transport. Individual goods and services provided free of charge, or at nominal prices, to *individual* households by governments or non-profit institutions are described as *social transfers in kind*. They may make a substantial contribution to the welfare or standard of living of the individual households that receive them. (Social transfers in kind do not include *collective* services provided by governments to the community as whole, such as public administration and defence.)

3.10 The expenditures on social transfers in kind are incurred by the governments or non-profit institutions that pay for them and not by the households that consume them. It could be decided that the CPI should be confined to consumption expenditures incurred by households, in which case free social transfers in kind would be excluded from the scope of the index. Even if they were to be included, they can be ignored in practice when they are provided free, on the grounds that households incur zero expenditures on them. Of course, their prices are not zero from the perspective of the units that finance the social transfers, but the relevant prices for a CPI are those payable by the households.

3.11 Social transfers cannot be ignored, however, when governments and non-profit institutions decide to introduce charges for them, a practice that has become increasingly common in many countries. For example, if the CPI is intended to measure the change in the total value of a basket of consumption goods and services that includes social transfers, increases in their prices from zero to some positive amount increase the cost of the basket and ought to be captured by a CPI.

Monetary versus non-monetary expenditures

3.12 A distinction may also be drawn between monetary and non-monetary expenditures depending on the nature of the resources used to pay for the goods and services. A monetary expenditure occurs when a household pays in cash, by cheque or credit card, or otherwise incurs a financial liability to pay, in exchange for the acquisition of a good or service. Non-monetary expenditures occur when households do not incur a financial liability but bear the costs of acquiring the goods or services in some other way.

3.13 *Non-monetary expenditures*. Payments may be made in kind rather than cash, as in barter transactions. The goods and services offered as payment in barter transactions are equivalent to negative expenditures and their price changes should, in principle, carry negative weights in a CPI. If the price of goods sold increases, the household is better off. However, as the two sides of a barter transaction should in principle be equal in value, the net expenditure incurred by two households engaged in barter should be zero. Barter transactions between households may therefore be ignored in practice for CPI purposes.

3.14 Households also incur non-monetary expenditures when household members receive goods and services from their employers as remuneration in kind. The employees pay for the goods and services with their own labour rather than cash. Consumption goods and services received as remuneration in kind can, in principle, be included in a CPI using the estimated prices that would be payable for them on the market.

3.15 A third important category of non-monetary expenditure occurs when households consume goods and services that they have produced themselves. The households incur the costs, while the expenditures are deemed to occur when the goods and services are consumed. Own account expenditures of this kind include expenditures on housing services produced for their own consumption by owner-occupiers. The treatment of goods and services produced for own consumption raises important conceptual issues that are discussed in more detail below.

3.16 *Monetary expenditures*. The narrowest concept of consumption that could be used for CPI purposes is one based on monetary expenditures only. Such an aggregate would exclude many of the goods and services actually acquired and used by households for purposes of consumption. Only monetary expenditures generate the monetary prices needed for CPI purposes. The prices of the goods and services acquired through non-monetary expenditures can only be imputed on the basis of the prices observed in monetary transactions. Imputed prices do not generate more price information. Instead, they affect the weighting attached to monetary prices by increasing the weight of those monetary prices which are used to value non-monetary expenditures.

3.17 If the main reason for compiling a CPI is the measurement of inflation, it may be decided to restrict the scope of the index to monetary expenditures only, especially since non-monetary expenditures do not generate any demand for money. Harmonized Indices of Consumer Prices (HICPs), used to measure inflation within the European Union, are confined to monetary expenditures (see Annex 1).

Acquisitions and uses

3.18 It has been customary in the literature on CPIs to draw a distinction between acquisitions of consumption goods and services by households and their subsequent use to satisfy their households' needs or wants. Consumption goods are typically acquired at one point of time and used at some other point of time, often much later, or they may be used repeatedly, or even continuously, over an extended period of time. The times of acquisition and use nevertheless coincide for many

services, although there are other kinds of services that provide lasting benefits and are not used up at the time they are provided.

3.19 The time at which a good is acquired is the moment at which ownership of the good is transferred to the consumer. In a market situation, it is the moment at which the consumer incurs a liability to pay, either in cash or in kind. The time at which a service is acquired is not so easy to determine precisely as the provision of a service does not involve any exchange of ownership. Instead, it typically leads to some improvement in the condition of the consumer. A service is acquired by the consumer at the same time that the producer provides it and the consumer accepts a liability to pay.

3.20 In a market situation, therefore, the time of acquisition for both goods and services is the time at which the liability to pay is incurred. When payments are not made immediately in cash, there may be a significant lapse of time before the consumer's bank account is debited for a purchase settled by cheque, by credit card or similar arrangement. The times at which these debits are eventually made depend on administrative convenience and on the particular financial and institutional arrangements in place. They have no relevance to the time of recording the transactions or the prices.

3.21 The distinction between time of acquisition and time of use is particularly important for durable goods and certain kinds of services.

Durables and non-durables

3.22 *Goods*. A ''non-durable'' good would be better described as a *single use* good. For example, food and drink are used once only to satisfy hunger or thirst. Heating oil, coal or firewood can be burnt once only, but they are nevertheless extremely durable physically and can be stored indefinitely. Households may hold substantial stocks of so-called non-durables, such as many foodstuffs and fuel, especially in periods of political or economic uncertainty.

3.23 Conversely, the distinguishing feature of consumer durables, such as furniture, household equipment or vehicles, is that they are durable under use. They can be used repeatedly or continuously to satisfy consumers' needs over a long period of time, possibly many years. For this reason, a durable is often described as providing a flow of ''services''' to the consumer over the period it is used (see also Box 14.3 of Chapter 14). There is a close parallel between the definitions of consumer durables and fixed assets. Fixed assets are goods that are used repeatedly or continuously over long periods of time in processes of production: for example, buildings or other structures, machinery and equipment. A list of the different kinds of consumer durables distinguished in the Classification of Individual Consumption according to Purpose (COICOP) is given below. Some durables last much longer than others, the less durable ones being described as ''semi-durables'' in COICOP, for example clothing. Dwellings are not classified as consumer durables in COICOP. They are treated as fixed assets and not consumption goods and therefore fall outside the scope of COICOP. However, the housing services produced and consumed by owner-occupiers are included in COICOP and classified in the same way as the housing services consumed by tenants.

3.24 *Services*. Consumers may continue to benefit, and derive utility, from some services long after they were provided because they bring about substantial, long-lasting or even permanent improvements in the condition of the consumers. The quality of life of persons receiving medical treatments such as hip replacements or cataract surgery, for example, is substantially and permanently improved. Similarly, consumers of educational services can benefit from them over their entire lifetimes.

3.25 For some analytical purposes, it may be appropriate to treat certain kinds of services, such as education and health, as the service equivalents of durable goods. Expenditures on such services can be viewed as investments that augment the stock of human capital. Another characteristic that education and health services share with durable goods is that they are often so expensive that their purchase has to be financed by borrowing or by running down other assets.

Consumer price indices based on acquisitions and uses

3.26 The distinction between the *acquisition* and the *use* of a consumption good or service has led to two different concepts of a CPI being proposed.

- A CPI may be intended to measure the average change between two time periods in the prices of the consumption goods and services acquired by households.
- Alternatively, a CPI may be intended to measure the average change between two time periods in the prices of the consumption goods and services used by households to satisfy their needs and wants.

3.27 Flows of acquisitions and uses may be very different for durables. Acquisitions of durables, like producer capital goods, are liable to fluctuate, depending on the general state of the economy, whereas the using up of the stock of durables owned by households tends be a gradual and smooth process. A CPI based on the uses approach requires that the index should measure period-to-period changes in the *prices of the flows of services* provided by the durables. As explained in Chapter 23, the value of the flow of services from a durable may be estimated by its ''user cost'', which consists essentially of the depreciation on the asset (at current prices) *plus* the interest cost. The inclusion of the interest cost as well as the depreciation means that, over the long term, the weight given to durables is greater than when they are measured simply by acquisitions. In principle, the flows of services, or benefits, derived from major educational and medical expenditures might also be estimated on the basis of user costs.

3.28 When durables are rented on the market, the rentals have to cover not only the values of the service flows but additional costs such as administration and management, repairs and maintenance, and overheads. For example, the amount payable to use a washing machine in a launderette has to cover the costs of the room space in which the machine is housed, electricity,

repairs and maintenance, the wages of supervisory staff, and so on, as well as the services provided by the machine itself. Similarly, the rentals payable for car hire may significantly exceed the cost of the service flow provided by the car on its own. In both cases, the customer is buying a bundle of services that includes more than just the use of the durable good.

3.29 Estimating the values and the prices of the flows of services provided by the stock of durables owned by households is difficult, whereas expenditures on durables are easily recorded, as are also the prices at which they are purchased. Partly because of these practical measurement difficulties, CPIs have, up to now, been based largely or entirely on the acquisitions approach. Similarly, national accounts tend to record expenditures on, or acquisitions of, durables rather than the flows of services they provide. As already noted, dwellings are treated as fixed assets and not consumer durables in the SNA. The treatment of owner-occupied housing is considered separately below.

Basket indices and cost of living indices

3.30 A fundamental conceptual distinction may be drawn between a *basket index* and a *cost of living index*. In a CPI context, a basket index is an index that measures the change between two time periods in the total expenditure needed to purchase a given set, or basket, of consumption goods and services. It is called a ''Lowe index'' in this manual. A cost of living index (COLI) is an index that measures the change in the minimum cost of maintaining a given standard of living. Both indices therefore have very similar objectives in that they aim to measure the change in the total expenditure needed to purchase *either* the same basket *or* two baskets whose composition may differ somewhat but between which the consumer is indifferent.

Lowe indices

3.31 CPIs are almost invariably calculated as Lowe indices in practice. Their properties and behaviour are described in detail in various chapters of this manual. The operational target for most CPIs is to measure the change over time in the total value of some specified basket of consumption goods and services purchased, or acquired, by some specified group of households in some specified period of time. The meaning of such an index is clear. It is, of course, necessary to ensure that the selected basket is relevant to the needs of users and also kept up to date. The basket may be changed at regular intervals and does not have to remain fixed over long periods of time. The determination of the basket is considered in more detail later in this chapter and in the following one.

Cost of living indices

3.32 The economic approach to index number theory treats the quantities consumed as being dependent on the prices. Households are treated as price takers who are assumed to react to changes in *relative* prices by adjusting the *relative* quantities they consume. A basket index that works with a fixed set of quantities fails to allow for the fact that there is a systematic tendency for consumers to substitute items that have become relatively cheaper for those that have become relatively dearer. A cost of living index based on the economic approach does take this substitution effect into account. It measures the change in the minimum expenditure needed to maintain a given standard when utility-maximizing consumers adjust their patterns of purchases in response to changes in relative prices. In contrast to a basket index, the baskets in the two periods in a cost of living index will generally not be quite the same in the two periods because of these substitutions.

3.33 The properties and behaviour of cost of living indices, or COLIs, are explained in some detail in Chapter 17. A summary explanation has already been given in Chapter 1. The maximum scope of a COLI would be the entire set of consumption goods and services consumed by the designated households from which they derive utility. It includes the goods and services received free as social transfers in kind from governments or non-profit institutions. Because COLIs measure the change in the cost of maintaining a given standard of living or level of utility, they lend themselves to a uses rather than an acquisitions approach, as utility is derived not by acquiring a consumer good or service but by using it to satisfy personal needs and wants.

3.34 Welfare may be interpreted to mean not only economic welfare, that is the utility that is linked to economic activities such as production, consumption and working, but also general well-being associated with other factors such as security from attack by others. It may not be possible to draw a clear distinction between economic and non-economic factors, but it is clear that total welfare is only partly dependent on the amount of goods and services consumed.

3.35 *Conditional and unconditional cost of living indices*. In principle, the scope of a COLI is influenced by whether or not it is intended to be a conditional and unconditional cost of living index. The *total welfare* of a household depends on a string of non-economic factors such as the climate, the state of the physical, social and political environment, the risk of being attacked either by criminals or from abroad, the incidence of diseases, and so on, as well as by the quantities of goods and services consumed. An *unconditional cost of living index* measures the change in the cost to a household of maintaining a given level of total welfare allowing the non-economic factors to vary as well as the prices of consumption goods and services. If changes in the non-economic factors lower welfare, then some compensating increase in the level of consumption will be needed in order to maintain the same level of total welfare. An adverse change in the weather, for example, requires more fuel to be consumed to maintain the same level of comfort as before. The cost of the *increased quantities* of fuel consumed drives up the unconditional cost of living index, irrespective of what has happened to prices. There are countless other events that can impact on an unconditional cost of living index, from natural disasters such as earthquakes to man-made disasters such as Chernobyl or acts of terrorism.

3.36 While there may be interest in an unconditional cost of living index for certain analytical and policy purposes, it is defined in such a way that it is deliberately intended to measure the effects of many other factors besides prices. If the objective is to measure the effects of price changes only, the non-price factors must be held constant. Given that a cost of living index is meant to serve as a consumer *price index*, its scope must be restricted to exclude the effects of events other than price changes. A *conditional* cost of living index is defined as the ratio of the minimum expenditures needed to maintain a given level of utility, or welfare, in response to price changes, assuming that all the other factors affecting welfare remain constant. It is conditional not only on a particular standard of living and set of preferences, but also on a particular state of the non-price factors affecting welfare. COLIs in this manual are to be understood as *conditional* cost of living indices.

3.37 A conditional COLI should not be viewed as second best. An unconditional COLI is a more comprehensive *cost of living* index than a conditional COLI, but it is not a more comprehensive *price* index than a conditional index. An unconditional index does not include more price information than a conditional index and it does not give more insight into the impact of price changes on households' welfare. On the contrary, the impact of the price changes is diluted and obscured as more variables impacting on welfare are included within the scope of the index.

3.38 Lowe indices, including Laspeyres and Paasche, are also conditional, being dependent on the choice of basket. The fact that the value of a basket index varies in predictable ways according to the choice of basket has generated much of the large literature on index number theory. Conceptually, Lowe indices and conditional COLIs have much in common. A Lowe index measures the change in the cost of a specified basket of goods and services, whereas a conditional COLI measures the change in the cost of maintaining the level of utility associated with some specified basket of goods and services, other things being equal.

Expenditures and other payments outside the scope of consumer price indices

3.39 Given that, conceptually, most CPIs are designed to measure changes in the prices of consumption goods and services, it follows that purchases of items that are not goods and services fall outside the intended scope of a CPI: for example, purchases of bonds, shares or other financial assets. Similarly, payments that are not even purchases because nothing is received in exchange fall outside the index: for example, payments of income taxes or social security contributions.

3.40 The implementation of these principles is not always straightforward, as the distinction between an expenditure on a good or service and other payments may not always be clear cut in practice. A number of conceptually difficult cases, including some borderline cases of a possibly controversial nature, are examined below.

Transfers

3.41 The definition of a transfer is a transaction in which one unit provides a good, service or asset to another without receiving any good, service or asset in return: i.e., transactions in which there is no counterpart. Transfers are unrequited. As no good or service of any kind is acquired by the household when it makes a transfer, the transfer must be outside the scope of a CPI. The problem is to determine whether or not certain kinds of transactions are in fact transfers, a problem common to both CPIs and national accounts.

3.42 *Social security contributions and taxes on income and wealth*. As households do not receive any specific, individual good or service in return for the payment of social security contributions, they are treated as transfers that are outside the scope of CPIs. Similarly, all payments of taxes based on income or wealth (the ownership of assets) are outside the scope of a CPI since they are unrequited compulsory transfers to government. Property taxes on dwellings (commonly levied as local authority taxes or rates) are outside the scope. It may be noted, however, that unrequited compulsory transfers could be incorporated within an unconditional COLI or within a more broadly defined conditional COLI that allows for changes in some other factors besides changes in the prices of consumption goods and services.

3.43 *Licences*. Households have to pay to obtain various kinds of licences and it is often not clear whether they are simply taxes under another name or whether the government agency providing the licence provides some kind of service in exchange, for example by exercising some supervisory, regulatory or control function. In the latter case, they could be regarded as purchases of services. Some cases are so borderline that they have been debated for years by taxation experts under the aegis of the International Monetary Fund (IMF) and other international agencies without reaching consensus. The experts therefore agreed to settle on a number of conventions based on practices followed in the majority of countries. It is appropriate to make use of these conventions for CPI, and also national accounts, purposes. These conventions are listed in the IMF's *Government Finance Statistics* (IMF, 2001) and have also been adopted in *SNA 1993*.

3.44 Payments by households for licences to own or use certain goods or facilities are, by convention, classified as consumption expenditures, not transfers, and are thus included within the scope of a CPI. For example, licence fees for radios, televisions, driving, firearms, and so on, as well as fees for passports, are included. On the other hand, licences for owning or using vehicles, boats and aircraft, and for hunting, shooting and fishing are conventionally classified as direct taxes and are therefore outside the scope of CPIs. Many countries, however, do include taxes for private vehicle use as they regard them as taxes on consumption for CPI purposes. As the actual circumstances under which licences are issued, and the conditions attaching to them, can vary significantly from

country to country, statistical offices may wish to deviate from the proposed conventions in some instances. In general, however, it seems appropriate to make use of conventions internationally agreed by the relevant experts.

3.45 *Gifts and subscriptions*. Gifts are transfers, by definition, and thus outside the scope of a CPI. Payments of subscriptions or donations to charitable organizations for which no easily identifiable services are received in return are also transfers. On the other hand, payments of subscriptions to clubs and societies, including charities, which provide their members with some kind of service (e.g., regular meetings, magazines, etc.) can be regarded as final consumption expenditures and included in a CPI.

3.46 *Tips and gratuities*. Non-compulsory tips or gratuities are gifts that are outside the scope of a CPI. There may be cases, however, where, although tips are not compulsory, it can be very difficult to obtain a good or service without some form of additional payment, in which case this payment should be included in the expenditure on, and the price of, the good or service in question.

Insurance

3.47 There are two main types of insurance, life and non-life. In both cases the premiums have two components. One is a payment for the insurance itself, often described as the net premium, while the other is an implicit service charge payable to the insurance enterprise for arranging the insurance: i.e., a fee charged for calculating the risks, determining the premiums, administering the collection and investment of premiums, and the payment of claims.

3.48 The implicit service charge is not directly observable. It is an integral part of the gross premium that is not separately identified in practice. As a payment for a service it falls within the scope of a CPI, but it is difficult to estimate.

3.49 In the case of non-life insurance, the net premium is essentially a transfer that goes into a pool covering the collective risks of policy holders as a whole. As a transfer, it falls outside the scope of a CPI. In the case of life insurance, the net premium is essentially a form of financial investment. It constitutes the purchase of a financial asset, which is also outside the scope of a CPI.

3.50 Finally, it may be noted that when insurance is arranged through a broker or agent separate from the insurance enterprise, the fees charged by the brokers or agents for their services are included within the scope of the CPI, over and above the implicit service charges made by the insurers.

Gambling

3.51 The amounts paid for lottery tickets or placed in bets also consist of two elements that are usually not separately identified – the payment of an implicit service charge (part of consumption expenditures) and a current transfer that enters the pool out of which the winnings are paid. Only the implicit or explicit service charges payable to the organizers of the gambling fall within the scope of a CPI. The service charges are usually calculated at an aggregate level as the difference between payables (stakes) and receivables (winnings).

Transactions in financial assets

3.52 Financial assets are not consumption goods or services. The creation of financial assets/liabilities, or their extinction, e.g., by lending, borrowing and repayments, are financial transactions that are quite different from expenditures on goods and services and take place independently of them. The purchase of a financial asset is obviously not expenditure on consumption, being a form of financial investment.

3.53 Some financial assets, notably securities in the form of bills, bond and shares, are tradable and have market prices. They have their own separate price indices, such as stock market price indices.

3.54 Many of the financial assets owned by households are acquired indirectly through the medium of pension schemes and life insurance. Excluding the service charges, pension contributions by households are similar to payments for life insurance premiums. They are essentially forms of investment made out of saving, and are thus excluded from CPIs. In contrast, the explicit or implicit fees paid by households for the services rendered by financial auxiliaries such as brokers, banks, insurers (life and non-life), pension fund managers, financial advisers, accountants, and so on, are within the scope of a CPI. Payments of such fees are simply purchases of services.

Purchases and sales of foreign currency

3.55 Foreign currency is a financial asset. Purchases and sales of foreign currency are therefore outside the scope of CPIs. Changes in the prices payable, or receivable, for foreign currencies resulting from changes in exchange rates are not included in CPIs. In contrast, the service charges made by foreign-exchange dealers are included within the scope of CPIs when households acquire foreign currency for personal use. These charges include not only explicit commission charges but also the margins between the buying or selling rates offered by the dealers and the average of the two rates.

Payments, financing and credit

3.56 Conceptually, the time at which an expenditure is incurred is the time at which the purchaser incurs a liability to pay: that is, when the ownership of the good changes hands or the service is provided. The time of payment is the time at which the liability is extinguished. The two may be simultaneous when payment is made immediately in cash, i.e., notes or coin, but the use of cheques, credit cards and other forms of credit facilities means that it is increasingly common for the payment to take place some time after the expenditure occurs. A further complication is that payments may be made in stages, with a deposit payable in advance. Given the time lags and complexity of financial instruments and

institutional arrangements, it may be difficult to determine exactly when payment takes place. The time may even be different from the standpoint of the purchaser and the seller.

3.57 For consistency with the expenditure data used as weights in CPIs, the prices should be recorded at the times at which the expenditures actually take place. This is consistent with an acquisitions approach.

Financial transactions and borrowing

3.58 Some individual expenditures may be very large: for example, the purchase of expensive medical treatment, a large durable good, or an expensive holiday. If the household does not have sufficient cash, or does not wish to pay the full amount immediately in cash, various options are open.

- The purchaser may borrow from a bank, moneylender or other financial institution.
- The purchaser may use a credit card.
- The seller may extend credit to the purchaser, or the seller may arrange for a third party, some kind of financial institution, to extend credit to the purchaser.

The creation of a financial asset/liability

3.59 When a consumer borrows to purchase a good or service, two distinct transactions are involved: the purchase of the good or service, and the borrowing of the requisite funds. The latter is a purely financial transaction between a creditor and a debtor in which a new financial asset/liability is created. This financial transaction is outside the scope of a CPI. As already noted, a financial transaction does not change wealth and there is no consumption involved. A financial transaction merely rearranges the individual's asset portfolio by exchanging one type of asset for another. For example, when a loan is made, the lender exchanges cash for a financial claim over the debtor. Similarly, the borrower acquires cash counterbalanced by the creation of an equal financial liability. Such transactions are irrelevant for CPI purposes.

3.60 In general, when a household borrows from financial institutions, including moneylenders, the borrowed funds may be used for a variety of purposes including the purchase of assets such as dwellings or financial assets (for example, bonds or shares), as well as the purchase of expensive goods and services. Similarly, the credit extended to the holder of a credit card can be used for a variety of purposes. In itself, the creation of a financial asset and liability by new borrowing has no impact on a CPI. There is no good or service acquired, no expenditure and no price.

3.61 It should be noted that interest payments are not themselves financial transactions. The payment of interest is quite different from the borrowing, lending or other financial transactions that give rise to it. Interest is considered separately below.

3.62 Hire purchase and mortgage loans must be treated consistently with other loans. The fact that certain loans are conditional on the borrower using the funds for a particular purpose does not affect the treatment of the loan itself. Moreover, conditional loans are by no means confined to the purchase of durable goods on "hire purchase". Conditional personal loans may be made for other purposes, such as large expenditures on education or health. In each case, the contracting of the loan is a separate transaction from the expenditure on the good or service and must be distinguished from the latter. The two transactions may involve different parties and may take place at quite different times.

3.63 Although the provision of finance is a separate transaction from the purchase of a good or service for which it is used, it may affect the price paid. Each case needs to be carefully considered. For example, suppose the seller agrees to defer payment for one year. The seller appears to make an interest free loan for a year, but this is not the economic reality. The seller makes a loan but it is not interest free. Nor is the amount lent equal to the "full" price. Implicitly, the purchaser issues a short-term bill to the seller to be redeemed one year later and uses the cash received from the seller to pay for the good. However, the present value of a bill at the time it is issued is its redemption value discounted by one year's interest. The amount payable by the purchaser at the time the purchase of the good actually takes place is the present discounted price of the bill and not the full redemption price to be paid one year later. It is this discounted price that should be recorded for CPI purposes. The difference between the discounted price and the redemption price is, of course, the interest that the purchaser implicitly pays on the bill over the course of the year. This way of recording corresponds to the way in which bills and bonds are actually valued on financial markets and also to the way in which they are recorded in both business and economic accounts. Deferring payments in the manner just described is equivalent to a price reduction and should be recognized as such in CPIs. The implicit interest payment is not part of the price. Instead, it reduces the price. This example shows that in certain circumstances the market rate of interest can affect the price payable, but it depends on the exact circumstances of the credit arrangement agreed between the seller and the purchaser. Each individual case needs to be carefully considered on its merits.

3.64 This case needs to be clearly distinguished from hire purchase, considered in the next section, when the purchaser actually pays the full price and borrows an amount equal to the full price while contracting to make explicit interest payments in addition to repaying the amount borrowed.

Hire purchase

3.65 In the case of a durable good bought on hire purchase, it is necessary to distinguish the de facto, or economic, ownership of the good from the legal ownership. The time of acquisition is the time the hire purchase contract is signed and the purchaser takes possession of the durable. From then onwards, it is the purchaser who uses it and derives the benefit from its use. The purchasing household becomes the de facto owner at the time the good is acquired, even though legal

ownership may not pass to the household until the loan is fully repaid.

3.66 By convention, therefore, the purchasing household is treated as buying the good at the time possession is taken and paying the full amount in cash at that point. At the same time, the purchaser borrows, either from the seller or some financial institution specified by the seller, a sum sufficient to cover the purchase price and the subsequent interest payments. The difference between the cash price and the sum total of all the payments to be made is equal to the total interest payable. The relevant price for CPI purposes is the cash price payable at the time the purchase takes place, whether or not the purchase is facilitated by some form of borrowing. The treatment of hire purchase is the same as that of ''financial leasing'' whereby fixed assets, such as aircraft, used for purposes of production are purchased by a financial institution and leased to the producer for most or all of the service life of the asset. This is essentially a method of financing the acquisition of an asset by means of a loan and needs to be distinguished from operational leasing such as hiring out cars for short periods of time. The treatment of hire purchase and financial leasing outlined here is followed in both business and economic accounting.

Interest payments

3.67 The treatment of interest payments on the various kinds of debt that households may have incurred raises both conceptual and practical difficulties. Nominal interest is a composite payment covering four main elements whose mix may vary considerably:

- The first component is the pure interest charge: i.e., the interest that would be charged if there were perfect capital markets and perfect information.
- The second component is a risk premium that depends on the creditworthiness of the individual borrower. It can be regarded as a built-in insurance charge under uncertainty against the risk of the debtor defaulting.
- The third component is a service charge incurred when households borrow from financial institutions that make a business of lending money.
- Finally, when there is inflation, the real value of a loan fixed in monetary terms (that is, its purchasing power over real goods and services) declines with the rate of inflation. However, creditors are able to offset the real holding, or capital, losses they expect to incur by charging appropriately high rates of nominal interest. For this reason, nominal interest rates vary directly with the rate of general inflation, a universally familiar phenomenon under inflationary conditions. In these circumstances, the main component of nominal interest may therefore be the built-in payment of compensation from the debtor to the creditor to offset the latter's real holding loss. When there is very high inflation it may account for almost all of the nominal interest charged.

3.68 The treatment of the first component, pure interest, is somewhat controversial but this component may account for only a small part of the nominal interest charged. The treatment of the second component, insurance against the risk of default, is also somewhat controversial.

3.69 The fourth component, the payment of compensation for the creditor's real holding loss, is clearly outside the scope of a CPI. It is essentially a capital transaction. It may account for most of nominal interest under inflationary conditions.

3.70 The third component constitutes the purchase of a service from financial institutions whose business it is to make funds available to borrowers. It is known as the *implicit service charge* and clearly falls within the scope of a CPI. It is included in COICOP. The service charge is not confined to loans made by ''financial intermediaries'', institutions that borrow funds in order to lend them to others. Financial institutions that lend out of their own resources provide the same kind of services to borrowers as financial intermediaries. When sellers lend out of their own funds, they are treated as implicitly setting up their own financial institution that operates separately from their principal activity. The rates of interest of financial institutions also include implicit service charges. Because some capital markets tend to be very imperfect and most households may not have access to proper capital markets, many lenders are effectively monopolists who charge very high prices for the services they provide, for example village moneylenders in many countries.

3.71 It is clear that interest payments should not be treated as if they were just pure interest or even pure interest plus a risk premium. It is very difficult to disentangle the various components of interest. It may be practically impossible to make realistic and reliable estimates of the implicit service charges embodied in most interest payments. Moreover, for CPI purposes it is necessary to estimate not only the values of the service charges but changes in the prices of the services over time. Given the complexity of interest flows and the fact that the different flows need to be treated differently, there seems to be little justification for including payments of nominal interest in a CPI, especially in inflationary conditions.

Household production

3.72 Households can engage in various kinds of productive activities that may be either aimed at the market or intended to produce goods or services for own consumption.

Business activities

3.73 Households may engage in business or commercial activities such as farming, retail trading, construction, the provision of professional or financial services, and so on. Goods and services that are used up in the process of producing other goods and services for sale on the market constitute *intermediate* consumption. They are not part of the *final* consumption of households. The prices of intermediate goods and services purchased by households are not to be included in CPIs. In practice, it is often difficult to draw a clear distinction between

intermediate and final consumption, as the same goods may be used for either purpose.

Consumption of own produce

3.74 Households do not in fact consume directly all of the goods and services they acquire for purposes of consumption. Instead, they use them as inputs into the production of other goods or services which are then used to satisfy their needs and wants. There are numerous examples. For example, basic foodstuffs such as flour, cooking oils, raw meat and vegetables may be processed into bread, cakes or meals with the assistance of other inputs including fuels, the services provided by consumer durables, such as fridges and cookers, and the labour services of members of the household. Inputs of materials, equipment and labour are used to clean, maintain and repair dwellings. Inputs of seeds, fertilizers, insecticides, equipment and labour are used to produce vegetables or flowers, and so on.

3.75 Some of the production activities taking place within households' activities, for example gardening or cooking, may perhaps provide satisfaction in themselves. Others, such as cleaning, may be regarded as chores that reduce utility. In any case, the goods or services used as inputs into these productive activities do not provide utility in themselves. Again, there are numerous examples of such inputs: raw foodstuffs that are unsuitable for eating without being cooked; cleaning materials; fuels such as coal, gas, electricity or petrol; fertilizers; the services of refrigerators and freezers; and so on.

3.76 Utility is derived from consuming the outputs from household production undertaken for own consumption. It is necessary, therefore, to decide whether a CPI should try to measure the changes in the prices of the outputs, rather than the inputs. In principle, it seems desirable to measure the output prices, but there are serious objections to this procedure.

3.77 On a conceptual level, it is difficult to decide what are the real final outputs from many of the more nebulous household production activities. It is particularly difficult to specify exactly what are the outputs from important service activities carried out within households, such as child care or care of the sick or elderly. Even if they could be satisfactorily identified, conceptually they would have to be measured and priced. There are no prices to be observed, as there are no sales transactions. Prices would have to be imputed for them and such prices would be not only hypothetical but inevitably very speculative. Their use in CPIs is not a realistic possibility in general and almost certainly would not be acceptable to most users who are primarily interested in the market prices paid by households.

3.78 The practical alternative is to treat the goods and services acquired by households on the market for use as inputs into the various kinds of household production activities as if they were themselves final consumer goods and services. They provide utility *indirectly*, assuming that they are used exclusively to produce goods and services that are directly consumed by households. This is the practical solution that is generally adopted not only in CPIs but also in national accounts, where household expenditures on such items are classified as final consumption. Although this seems a simple and conceptually acceptable solution to an otherwise intractable problem, exceptions may be made for one or two kinds of household production that are particularly important and whose outputs can readily be identified.

3.79 *Subsistence agriculture*. In the national accounts, an attempt is made to record the value of the agricultural output produced for own consumption. In some countries, subsistence agriculture may account for a large part of the production and consumption of agricultural produce. The national accounts require such outputs to be valued at their market prices. It is doubtful whether it is appropriate to try to follow this procedure for CPI purposes.

3.80 A CPI may record either the actual input prices or the imputed output prices, but not both. If the imputed output prices for subsistence agriculture are included in a CPI, the prices of the purchased inputs should be excluded. This could remove from the index most of the market transactions made by such households. Expenditures on inputs may constitute the principal contact that the households have with the market and through which they experience the effects of inflation. It therefore seems preferable to record the actual prices of the inputs and not the imputed prices of the outputs in CPIs.

3.81 *Housing services produced for own consumption*. The treatment of owner-occupied housing is difficult and somewhat controversial. There may no consensus on what is best practice. This is discussed in several chapters of this manual, especially in Chapters 10 and 23. Conceptually, the production of housing services for own consumption by owner-occupiers is no different from other types of own account production taking place within households. The distinctive feature of the production of housing services for own consumption, as compared with other kinds of household production, is that it requires the use of an extremely large fixed asset in the form of the dwelling itself. In economics, and also national accounting, a dwelling is usually regarded as a fixed asset so that the purchase of a dwelling is classified as gross fixed capital formation and not as the acquisition of a durable consumer good. Fixed assets are used for purposes of production, not consumption. The dwelling is not consumed directly. The dwelling provides a stream of capital services that are consumed as inputs into the production of housing services. This production requires other inputs, such as repairs, maintenance and insurance. Households consume the housing services produced as outputs from this production.

3.82 It is important to note that there are two quite distinct service flows involved:

- One consists of the flow of *capital services* provided by the dwelling which are consumed as *inputs* into the production of housing services.
- The other consists of the flow of *housing services* produced as *outputs* which are consumed by members of the household.

The two flows are not the same. The value of the output flow will be greater than that of the input flow. The

capital services are defined and measured in exactly the same way as the capital services provided by other kinds of fixed assets, such as equipment or structures other than dwellings. As explained in detail in Chapter 23, the value of the capital services is equal to the user cost and consists primarily of two elements, depreciation and the interest, or capital, costs. Capital costs are incurred whether or not the dwelling is purchased by borrowing on a mortgage. When the dwelling is purchased out of own funds, the interest costs represent the opportunity cost of the capital tied up in the dwelling; that is, the foregone interest that could have been earned by investing elsewhere.

3.83 There are two main options for the own-account production and consumption of housing services in CPIs. One is to price the output of housing services consumed. The other is to price the inputs, including the inputs of capital services. If housing services are to be treated consistently with other forms of production for own consumption within households, the input approach must be adopted. The production and consumption of housing services by owner-occupiers may, however, be considered to be so important as to merit special treatment.

3.84 If it is decided to price the outputs, the prices may be estimated using the market rents payable on rented accommodation of the same type. This is described as the rental equivalence approach. One practical problem is that there may be no accommodation of the same type that is rented on the market. For example, there may be no rental market for rural dwellings in developing countries where most of the housing may actually be constructed by the households themselves. Another problem is to ensure that the market rents do not include other services, such as heating, that are additional to the housing services proper. A further problem is that market rents, like the rentals charged when durables are leased, have to cover the operating expenses of the renting agencies as well as the costs of the housing services themselves, and also provide some profit to the owners. Finally, rented accommodation is inherently different from owner-occupied housing in that it may provide the tenants with more flexibility and mobility. The transaction costs involved in moving house may be much less for tenants.

3.85 In principle, if the output, or rental equivalence, approach is adopted then the prices of the inputs into the production of housing services for own consumption, such as expenditures on repairs, maintenance and insurance, should not be included as well. Otherwise, there would be double counting.

3.86 The alternative is to price the inputs into the production of housing services for own consumption in the same way that other forms of production for own consumption within households are treated. In addition to intermediate expenditures such as repairs, maintenance and insurance, the costs of the capital services must be estimated and their prices included in the CPI. The technicalities of estimating the values of the flow of capital services are dealt with in Chapter 23. As in the case of other types of production for own consumption within households, it is not appropriate to include the estimated costs of the labour services provided by the owners themselves.

3.87 Whether the input or the output approach is adopted, it is difficult to estimate the relevant prices. The practical difficulties experienced may sometimes be so great as to lead compilers and users to query the reliability of the results. There is also some reluctance to use imputed prices in CPIs, whether the prices refer to the inputs or the outputs. It has therefore been suggested that the attempt to measure the prices of housing service flows should be abandoned. Instead, it may be preferred to include the prices of the dwellings themselves in the CPI. In most cases these are observable market prices, although many dwellings, especially in rural areas in developing countries, are also built by their owners, in which case their prices still have to be estimated on the basis of their costs of production.

3.88 Including the prices of dwellings in CPIs involves a significant change in the scope of the index. A dwelling is clearly an asset and its acquisition is capital formation and not consumption. While the same argument applies to durables, there is a substantial difference of degree between a household durable and a dwelling, as reflected by the considerable differences in their prices and their service lives. In principle, therefore, extending the scope of a CPI to include dwellings implies extending the scope of the index to include household gross fixed capital formation.

3.89 The advantage of this solution is that it does not require estimates of either the input or output service flows, but conceptually it deviates significantly from the concept of a CPI as traditionally understood. In the case of both consumer durables and dwellings, the options are either to record the acquisitions of the assets in the CPIs at their market prices or to record the estimated prices of the service flows, but not both. Just as no service flows from durables are included in CPIs at present because their acquisitions are included, similarly if the prices of dwellings are included in CPIs the service flows would have to be excluded. As explained in Chapter 23, the acquisitions approach may give insufficient weight to durables and dwellings over the long run because it does not take account of the capital costs incurred by the owners of the assets.

Coverage of households and outlets

3.90 The group of households included in the scope of a CPI is often referred to as the ''reference households'', or the ''reference population''.

Definition of household

3.91 For CPI purposes, households may be defined in the same way as in population censuses. The following definition is recommended for use in population censuses (United Nations, 1998a):

> A household is classified as either (a) a one person household defined as an arrangement in which one person makes provision for his or her food or other essentials for living without combining with any other person to form part of a multi-person household; or (b) a multi-person

household, defined as a group of two or more persons living together who make common provision for food or other essentials for living. The persons in the group may pool their incomes and have a common budget to a greater or lesser extent; they may be related or unrelated persons or a combination of persons both related and unrelated.

3.92 This definition is essentially the same as that used in household budget surveys and in the SNA. The scope of a CPI is usually confined to private households, and excludes institutional households such as groups of persons living together indefinitely in religious institutions, residential hospitals, prisons or retirement homes. Nevertheless, convalescent homes, schools and colleges, the military, and so on are not treated as institutional households; their members are treated as belonging to their private households. The HICP coverage of households, however, is consistent with the *SNA 1993* definition and thus includes institutional households.

Types of household

3.93 In almost all countries, the CPI scope is designed to include as many private households as possible, and is not confined to those belonging to a specific socio-economic group. The HICP regulations require that coverage should be of households independent of their income level.

3.94 In some countries, however, extremely wealthy households are excluded for various reasons. Their expenditures may be considered to be very atypical, while their expenditure data, as collected in household budget surveys, may be unreliable. The response rates for wealthy households in household budget surveys are usually quite low. In addition, it may be too costly to collect prices for some of the consumer goods and services purchased exclusively by the wealthy. Some countries may decide to exclude other kinds of households. For example, the United Kingdom CPI excludes not only the top 4 per cent of households by income but also households mainly dependent on state pensions, with the net result that roughly 15 per cent of households, and 15 per cent of expenditure, is excluded. Japan and the Republic of Korea exclude households mainly engaged in agriculture, forestry and fishing, and all one-person households. Such exclusions affect the expenditure weights to the extent that the patterns of expenditures of the excluded groups differ from those of the rest of the population.

3.95 In addition to a single wide-ranging official (headline) CPI relevant to the country as a whole, many countries publish a range of subsidiary indices relating to sub-sectors of the population. For example, the Czech Republic compiles separate indices for:

– all households;
– all employees;
– employees with children;
– low-income employees;
– employees, incomplete families;
– pensioners;
– low-income pensioners;
– households in Prague;
– households in communities with populations of over 5,000.

3.96 In India, CPI compilation originated from a need to maintain the purchasing power of workers' incomes, and so four different CPIs are compiled at the national level for reference households headed by the following kinds of workers:

– agricultural labourers;
– industrial workers;
– rural labourers;
– urban non-manual employees.

Geographical coverage

3.97 *Urban and rural*. Geographical coverage may refer either to the geographical coverage of expenditures or the coverage of price collection. Ideally these two should coincide, whether the CPI is intended to be a national or a regional index. In most countries, prices are collected in urban areas only since their movements are considered to be representative of the price movements in rural areas. In these cases national weights are applied and the resulting index can be considered a national CPI. If price movements in urban and rural areas are felt to be sufficiently different – although price collection is restricted to urban areas because of resource constraints – then urban weights should be applied and the resulting index must be considered as purely an urban and not a national CPI. For example, the following countries cover urban households only (expenditure weights and prices): Australia, Mexico, Republic of Korea, Turkey, United States. Most other developed countries tend to use weights covering urban and rural households, although in nearly every case price collection takes place in urban areas only. Of course, the borderline between urban and rural is inevitably arbitrary and may vary from country to country. For example, in France urban price collection is interpreted to include villages with as few as 2,000 residents.

3.98 Decisions about geographical coverage in terms of urban versus rural coverage will depend on population distribution and the extent to which expenditure patterns and the movements of prices tend to differ between urban and rural areas.

3.99 *Foreign purchases of residents and domestic purchases of non-residents*. Problems arise when households make expenditures outside the boundaries of the area or country in which they are resident. Decisions about the treatment of such expenditures depend on the main use of a CPI. For inflation analysis, it is the price change within a country which is of interest. An index of inflation is needed that covers all so-called "domestic" consumption expenditures that take place within the geographical boundaries of the country, whether made by residents or non-residents. HICPs (see Annex 1) are defined in this way as indices of domestic inflation. Thus they exclude consumption expenditures made by residents when they are outside the country (which belong to the inflation indices of the countries where the purchases are made), and they include expenditures within the country made by residents of other countries. In practice, expenditures by visitors from abroad may be

difficult to estimate, since household budget surveys do not cover non-resident households, although estimates might be possible for some commodities using retail sales data or special surveys of visitors. These issues become more important when there is significant cross-border shopping as well as tourism.

3.100 When CPIs are used for escalating the incomes of residents, it may be appropriate to adopt the so-called ''national'' concept of expenditure which covers all the expenditures of residents, whether inside or outside the country, including remote purchase from non-resident outlets, for example by the Internet, telephone or mail. Household budget surveys can cover all these types of expenditure, although it may be difficult to identify the country from which remote (Internet, mail, etc.) purchases are being made. The prices paid for airline tickets and package holidays bought within the domestic territory should also be covered. It can be difficult, however, to obtain price data for the goods and services purchased by residents when abroad, although in some cases sub-indices of the partner countries' CPIs might be used.

3.101 *Regional indices*. When compiling regional indices, the concept of residence applies to the region in which a household is resident. It is then possible to draw a distinction between the expenditures within a region and the expenditures of the residents of that region, analogous to the distinction between the ''domestic'' and ''national'' concepts of expenditure at the national level. The same issues arise for regional indices as were discussed in paragraph 3.97. The principles applying to cross-border shopping between regions are the same as for international cross-border shopping, but data availability is generally different. If the scope of the regional index is defined to include the purchases by regional residents when in other regions (abroad), then, although price data for the other regions should be readily available, it is unlikely that expenditure data will be available with the necessary split between expenditure within and expenditure outside the region of residence.

3.102 Care must be taken to treat cross-border shopping in the same way in all regions. Otherwise double counting, or omission, of expenditures may occur when regional data are aggregated. Where regional indices are aggregated to give a national index, the weights should be based on regional expenditure data rather than on population data alone.

3.103 Many countries try to satisfy the differing needs of their many CPI users by deriving a family of indices with differing coverage, headed by a single wide-ranging official (headline) CPI which is relevant to the country as a whole. In some large countries, regional indices are more widely used than the national CPI, particularly where the indices are used for escalating incomes. Thus, in addition to the headline CPI, which has the widest coverage possible, subsidiary indices are published which may relate to:

- sub-sectors of the population;
- geographical regions;
- specific commodity groups; sub-indices of the overall (official all-items) CPI should be published at as detailed a level as possible, since many users are interested in the price change of specific commodity groups.

3.104 In effect, many statistical offices are moving towards a situation in which a database of prices and weights is maintained from which a variety of subsidiary indices is derived.

Outlet coverage

3.105 The coverage of outlets is dictated by the purchasing behaviour of the reference households. As already stated, in principle, the prices relevant to CPIs are the prices paid by households. In practice, however, it is usually not feasible to collect price information directly from households, although as more sales are made through electronic points of sale which record and print out both the items purchased and their prices, it may become increasingly practical to collect information on the actual transaction prices paid by households. In the meantime, it is necessary to rely mainly on the prices at which products are offered for sale in retail shops or other outlets. All the outlets from which the reference population makes purchases are within the scope of the CPI, and should be included in the sampling frame from which the outlets are selected.

3.106 Examples of outlets are:

- retail shops – from very small permanent stalls to multinational chains of stores;
- market stalls and street vendors;
- establishments providing household services – electricians, plumbers, window cleaners, and so on;
- leisure and entertainment providers;
- health and education services providers;
- mail or telephone order agencies;
- the Internet;
- public utilities;
- government agencies and departments.

3.107 The principles governing the selection of a sample of outlets from which to collect prices are discussed in some detail in Chapters 5 and 6.

Price variation

3.108 Price variation occurs when exactly the same good or service is sold at different prices at the same moment of time. Different outlets may sell exactly the same product at different prices, or the same product may be sold from a single outlet to different categories of purchasers at different prices.

3.109 If markets were ''perfect'' in an economic sense, identical products would all sell at the same price. If more than one price were quoted, all purchases would be made at the lowest price. This suggests that products sold at different prices cannot be identical but must be qualitatively different in some way. When the price differences are, in fact, attributable to quality differences, the price differences are only apparent, not genuine. In such cases, a change in the average price resulting from a shift in the pattern of quantities sold at different prices would reflect a change in the average quality of

the products sold. This would affect the volume and not the price index.

3.110 If statistical offices do not have enough information about the characteristics of goods and services selling at different prices, they have to decide whether to assume that the observed price differences are genuine or only apparent. The default procedure most commonly adopted in these circumstances is to assume that the price differences are apparent. This assumption is typically made for both CPI and national accounts purposes.

3.111 However, markets are seldom perfect. One reason for the co-existence of different prices for identical products may be that the sellers are able to practise price discrimination. Another reason may simply be that consumers lack information and may buy at higher prices out of ignorance. Also, markets may be temporarily out of equilibrium as a result of shocks or the appearance of new products. It must be recognized, therefore, that genuine price differences do occur.

Price discrimination

3.112 Economic theory shows that price discrimination tends to increase profits. It may not be feasible to practise price discrimination for goods because they can be retraded. Purchasers discriminated against would not buy directly but would try to persuade those who could purchase at the lowest prices to buy on their behalf. Services, however, cannot be retraded, as no exchange of ownership takes place.

3.113 Price discrimination appears to be extremely common, almost the norm, for many kinds of services including health, education and transport. For example, senior citizens may be charged less than others for exactly the same kinds of health or transportation services. Universities may charge foreign students higher fees than domestic students. As it is also easy to vary the qualities of the services provided to different consumers, it can be difficult to determine to what extent observed price differences are a result of quality differences or pure price discrimination. Sellers may even attach trivial or spurious differences in terms or conditions of sale to the services sold to different categories of purchasers in order to disguise the price discrimination.

3.114 Price discrimination can cause problems with regard to price indices. Suppose, for example, that a service supplier discriminates by age by charging senior citizens aged 60 years or over price p_2 and others price p_1, where $p_1 > p_2$. Suppose, further, that the supplier then decides to redefine senior citizens as those aged 70 years or over while otherwise keeping prices unchanged. In this case, although neither p_1 nor p_2 changes, the price paid by individuals aged 60 to 70 years changes and the average price paid by all households increases.

3.115 This example illustrates a point of principle. Although neither of the stated prices, p_1 and p_2, at which the services are on offer changes, the prices paid by certain households do change if they are obliged to switch from p_2 to p_1. From the perspective of the households, price changes have occurred and a CPI should, in principle, record a change. When prices are collected from sellers and not from households, such price changes are unlikely to be recorded.

Price variation between outlets

3.116 The existence of different prices in different outlets raises similar issues. Pure price differences are almost bound to occur when there are market imperfections, if only because households are not perfectly informed. When new outlets open selling at lower prices than existing ones, there may be a time lag during which exactly the same item sells at different prices in different outlets because of consumer ignorance or inertia.

3.117 Households may choose to switch their purchases from one outlet to another or even be obliged to switch because the universe of outlets is continually changing, some outlets closing down while new outlets open up. When households switch, the effect on the CPI depends on whether the price differences are pure or apparent. When the price differences are genuine, a switch between outlets changes the average prices paid by households. Such price changes ought to be captured by CPIs. On the other hand, if the price differences reflected quality differences, a switch would change the average quality of the products purchased, and hence affect volume, not price.

3.118 Most of the prices collected for CPI purposes are offer prices and not the actual transactions prices paid by households. In these circumstances, the effects of switches in the pattern of households' purchases between outlets may remain unobserved in practice. When the price differences reflect quality differences, the failure to detect such switches does not introduce any bias into the CPI. Buying at a lower price means buying a lower-quality product, which does not affect the price index. However, when the price differences are genuine, the failure to detect switches will tend to introduce an upward bias in the index, assuming households tend to switch towards outlets selling at lower prices. This potential bias is described as *outlet substitution bias*.

Outlet rotation

3.119 A further complication is that, in practice, prices are collected from only a sample of outlets and the samples may change, either because outlets open and close or because there is a deliberate rotation of the sample periodically. When the prices in the outlets newly included in the sample are different from those in the previous outlets, it is again necessary to decide whether the price differences are apparent or genuine. If they are assumed to be apparent, the difference between the price recorded previously in an old outlet and the new price in the new outlet is not treated as a price change for CPI purposes, the difference being treated as attributable to quality difference. As explained in more detail in Chapter 7, if this assumption is correct, the price changes recorded in the new outlets can simply be linked to those previously recorded in the old outlets without introducing any bias into the index. The switch from the old to the new outlets does not have any impact on the CPI.

3.120 If the price differences between the old and the new outlets are deemed to be genuine, however, the

simple linking just described can lead to bias. When households change the price they pay for a product by changing outlets, the price changes should be captured by the CPI. As explained in more detail in Chapter 7, it seems that most statistical offices tend to assume that the price differences are not genuine and simply link the new price series on to the old. Given that it is unrealistic to assume that markets are always perfect and that pure price variation never occurs, this procedure, although widely used, is questionable and may lead to upward bias. Such bias is described as *outlet rotation bias*. One possible strategy that has been suggested is to assume that half of any observed price difference between old and new outlets is genuine and half is a result of quality difference, on the grounds that, although inevitably somewhat arbitrary, it is likely to be closer to the truth than assuming that the difference is either entirely genuine or entirely attributable to quality differences (see McCracken, Tobin et al., 1999).

Treatment of some specific household expenditures

3.121 Some of the expenditures made by households may not be on goods and services for household consumption and may therefore fall outside the scope of a CPI. One major category consists of the business expenditures made by households.

Fees of agents and brokers

3.122 When a house is purchased for own use by an owner-occupier, it can be argued that the transfer costs associated with purchase (and sale) should be treated as consumption expenditures in the same way as the brokers' fees incurred when financial assets are bought or sold. The fees paid to an agent to buy or sell houses are included in many national CPIs, provided that the house is to be occupied by the owner and not rented to a third party.

Undesirable or illegal goods and services

3.123 All the goods and services that households willingly purchase in order to satisfy their personal needs or wants constitute consumers' expenditures and therefore fall within the scope of a CPI, irrespective of whether their production, distribution or consumption is illegal or carried out in the underground economy or on the black market. Particular kinds of goods or services must not be excluded because they are considered to be undesirable, harmful or objectionable. Such exclusions could be quite arbitrary and undermine the objectivity and credibility of the CPI:

- First, it should be noted that some goods and services might be deemed to be undesirable at some times and desirable at others, or vice versa. People's attitudes change as they acquire more information, especially as a result of scientific advances. Similarly, some goods or services may be deemed to be undesirable in some countries but not in others at the same point of time. The concept of an undesirable good is inherently subjective and somewhat arbitrary and volatile.
- Second, if it is accepted that some goods and services may be excluded on the grounds that they are undesirable, the index is thereby exposed to actual or attempted manipulation by pressure groups.
- Third, attempts to exclude certain goods or services by pressure groups may be based on a misunderstanding of the implications of so doing. For example, if the CPI is used for escalating incomes, it may be felt that households ought not be compensated for increases in the prices of certain undesirable products. However, excluding them does not imply lowering the index. A priori, excluding some item is just as likely to increase the CPI as reduce it, depending on whether the price increase for the item in question is below or above the average for other goods and services. For example, if it is decided to exclude smoking from a CPI and the price increase for smoking products is below average, excluding smoking actually increases the income of smokers (just as it does for non-smokers).

3.124 While goods and services that households willingly choose to consume should not, in principle, be excluded from a CPI because they are acquired in the underground economy or even illegally, it may be impossible to obtain the requisite data on the expenditures or the prices, especially on illegal goods and services. They may well be excluded in practice.

Luxury goods and services

3.125 When a CPI is used as an index of general inflation, it ought to include all households regardless of their socio-economic group and also all consumer goods and services regardless of how expensive they are. Similarly, the scope of an index used for purposes of escalating incomes should include all the goods and services purchased by the reference households, irrespective of whether any of these goods and services are considered to be luxuries or otherwise unnecessary or undesirable.

3.126 Of course, if the reference households are confined to a select group of households, the index will effectively exclude all those items that are purchased exclusively by households that are not in the group. For example, excluding the wealthiest 5 per cent of households will, in practice, exclude many luxury items from the scope of the index. As already noted, such households may be excluded for various reasons, including the unreliability of their expenditure data and the fact that collecting prices for some items purchased exclusively by a tiny minority of households may not be cost-effective. Once the group of reference households has been decided and defined, however, judgements should not be made about whether to exclude certain of their expenditures that are considered to be non-essential or on luxuries.

Second-hand goods

3.127 Markets for used or second-hand goods exist for most durable goods. Household expenditures include expenditures on second-hand goods and are therefore

within the scope of a CPI. Households' sales of durables constitute negative expenditures, however, so that the weights for second-hand goods are based on households' net expenditures: i.e., total purchases less sales. The total expenditure on a particular type of second-hand good is a function of the rate at which it is bought and sold, i.e., a higher turnover rate (number of transactions) gives a higher total expenditure. A higher turnover does not, however, increase the rate at which any individual good can be used for purposes of consumption or the flow of services that may be obtained from the good.

3.128 Households may buy second-hand goods through any of the following routes:

- *Directly from another household* – the selling household will record the proceeds of the sale as receipts. Net expenditures, i.e., expenditures *less* receipts, are zero so no weight is attached to purchases and sales from one household to another.
- *From another household via a dealer* – in principle, households' expenditures on the services of the dealers are given by the values of their margins (the difference between their buying and selling prices). These intermediation services should be included in CPIs. They should be treated in the same way as the fees charged by agents such as financial auxiliaries. The margins may be extremely difficult to estimate in practice. Care should be taken to include trade-ins either as purchases by the dealers or receipts of households.
- *Directly from another sector, i.e., from an enterprise or from abroad* – the weight would be household purchases of the second-hand goods from other sectors *less* sales to other sectors.
- *From an enterprise or from abroad via a dealer* – the appropriate weight is given by household purchases from dealers *less* any household sales to dealers *plus* the aggregate of dealers' margins on the products that they buy from and resell to households. Trade-ins should count as part of sales by households (in the case of cars, the weight given to new cars should not include any deduction for the value of trade-ins).

3.129 In some countries, many of the durables purchased by households, especially vehicles, may be imports of second-hand goods from other countries. The prices and expenditures on these goods enter the CPI in the same way as those for newly produced goods. Similarly, in some countries there may be significant net purchases of second-hand vehicles by households from the business sector, these vehicles possibly carrying more weight in the index than new vehicles purchased by households.

Imputed expenditures on goods and services

3.130 As explained in earlier sections, many of the goods and services acquired and used by households for purposes of their own final consumption are not purchased in monetary transactions but are acquired through barter or as remuneration in kind or are produced by households themselves. It is possible to estimate what households would have paid if they had purchased these goods and services in monetary transactions or, alternatively, what it cost to produce them. In other words, values may be imputed for these non-monetary expenditures.

3.131 The extent to which it is desirable to include imputed expenditures within the scope of a CPI depends partly on the main purpose of the index. If the CPI is intended to be a measure of consumer inflation, it can be argued that only monetary expenditures should be included. Inflation is a monetary phenomenon measured by changes in monetary prices recorded in monetary transactions. Even when the main use of a CPI is for indexation purposes, it can be argued that it should only reflect changes in the monetary prices actually paid by the reference population. Consistent with the objective of monitoring inflation in the European Union, the aim of the Harmonized Index of Consumer Prices (HICP) compiled by Eurostat is to measure inflation faced by consumers. The concept of "household final monetary consumption expenditure" (HFMCE) used in the HICP defines both the goods and services to be covered, and the price concept to be used, i.e., prices net of reimbursements, subsidies and discounts. HFMCE refers only to monetary transactions and includes neither consumption of own production (e.g., agricultural goods or owner-occupied housing services) nor consumption of goods and services received as income in kind.

3.132 When the CPI is intended to be a cost of living index, some imputed expenditures would normally be included within the scope of the CPI on the grounds that the goods and services acquired in non-monetary transactions affect households' living standards. As already noted, most countries include households' imputed expenditures on housing services produced by owner-occupiers but not imputed expenditures on goods such as agricultural goods produced for own consumption.

Price coverage

3.133 A CPI should reflect the experience of the consumers to whom it relates, and should therefore record what consumers actually pay for the goods and services which are included in the scope of the index. The expenditures and prices recorded should be those paid by consumers, including any taxes on the products, and taking account of all discounts, subsidies and most rebates, even if discriminatory or conditional. It may be virtually impossible, however, to take account of all discounts and rebates in practice. Sensible practical compromises are needed, for which recommendations and examples are given in Chapter 6.

3.134 When households pay the full market prices for products and are then subsequently reimbursed by governments or social security schemes for some of the amounts paid, CPIs should record the market prices *less* the amounts reimbursed. This kind of arrangement is common for educational and medical expenditures.

Taxes and subsidies

3.135 All taxes on products, such as sales taxes, excise taxes and value added tax (VAT), are part of

the purchasers' prices paid by consumers that should be used for CPI purposes. Similarly, subsidies should be taken into account, being treated as negative taxes on products.

3.136 For some analytical and policy purposes, it may be useful to estimate a CPI that measures price movements excluding the effects of changes in taxes and subsidies. For monetary policy-makers, the price increases resulting from changes in indirect taxes or subsidies are not part of an underlying inflationary process but are attributable to their own manipulation of these economic levers. Similarly, when a CPI is used for escalation purposes, any increase in a CPI resulting from increases in indirect taxes leads to an increase in wages and benefits linked to the CPI, despite the fact that the aim of the tax increase might have been to reduce consumers' purchasing power. Alternatively, an increase in subsidies might be intended to stimulate consumption, but the resulting lower prices could be offset by a smaller increase in indexed wages and benefits.

3.137 *Net price indices*. Net price indices may be compiled in which taxes on consumer goods or services are deducted from the purchasers' prices, and subsidies are added back on. Such indices do not, however, necessarily show how prices would have moved if there were no taxes or changes in taxes. It is notoriously difficult to estimate the true incidence of taxes on products: that is, the extent to which taxes or subsidies, or changes therein, are passed on to consumers. It is also difficult to take account of the secondary effects of changes in taxes. In order to estimate the secondary effects, input–output analysis can be used to work out the cumulative impact of taxes and subsidies through all the various stages of production. For example, some of the taxes on vehicle fuel will enter the price of transport services which in turn will enter the prices of transported goods, some of which will enter the prices paid for consumer goods by retailers and hence the prices which they charge to consumers. To track all these impacts would demand a much more detailed and up-to-date input–output table than is available in most countries. A more practicable alternative is therefore simply to confine the taxes and subsidies for which correction is made to those levied at the final stage of sale at retail; that is, primarily to VAT, sales and excise taxes. Estimating prices less these taxes only, or corrected for changes in these taxes only, is more feasible. In the case of a percentage sales tax or VAT, the calculation is simple, but in the case of excise taxes, it is necessary to ascertain the percentage mark-up by the retailer, since the excise tax will also be marked up by this percentage.

Discounts, rebates, loyalty schemes and ''free'' products

3.138 CPIs should take into account the effects of rebates, loyalty schemes, and money-off vouchers. Given that a CPI is meant to cover all the reference households, whether in the country as a whole or in a particular region, discounts should be included even if they are available only to certain households or to consumers satisfying certain payment criteria.

3.139 It may be difficult to record discriminatory or conditional discounts for practical reasons. When only one selected group of households can enjoy a certain discount on a specific product, the original stratum for that product is split into two new strata, each experiencing different price changes and each requiring a weight. So, unless base period expenditures for all possible strata are known, it is not possible to record discriminatory discounts correctly. Similarly, with conditional discounts, e.g. discounts on utility bills for prompt payment, it can be difficult to record the effect of the introduction of such offers unless data are available on the proportion of customers taking advantage of the offer. These kinds of practical problems also arise when there is price discrimination and the sellers change the criteria that define the groups to whom different prices are charged, thereby obliging some households to pay more or less than before without changing the prices themselves. These cases are discussed further in Chapter 7.

3.140 Although it is desirable to record all price changes, it is also important to ensure that the qualities of the goods or services for which prices are collected do not change in the process. While discounted prices may be collected during general sales seasons, care should be taken to ensure that the quality of the products being priced has not deteriorated.

3.141 The borderline between discounts and rebates can be hazy and is perhaps best drawn according to timing. In other words, a discount takes effect at the time of purchase, whereas a rebate takes effect some time later. Under this classification, money-off vouchers are discounts, and as with the conditional discounts mentioned above, can only be taken into account in a CPI if they relate to a single product and if the take-up rate is known at the time of CPI compilation. Since this is highly unlikely, the effect of money-off vouchers is usually excluded from a CPI. It should be noted that the discount is recorded only when the voucher is used, not when the voucher is first made available to the consumer.

3.142 Rebates may be made in respect of a single product, e.g. air miles, or may be more general, e.g. supermarket loyalty schemes where a $10 voucher is awarded for every $200 spent. As with discounts discussed above, such rebates can only be recorded as price falls if they relate to single products and can be weighted according to take-up. Bonus products provided ''free'' to the consumer, either by larger pack sizes or offers such as ''two packs for the price of one'', should be treated as price reductions, although they may be ignored in practice when the offers are only temporary and quickly reversed. When permanent changes to pack sizes occur, quality adjustments should be made (see Chapter 7).

3.143 Given the practical difficulties in correctly recording all these types of price falls, it is usual to reflect discounts and rebates only if unconditional, whereas loyalty schemes, money-off coupons, and other incentives are ignored. Discounts during seasonal sales may be recorded provided that the quality of the goods does not change.

Classification

3.144 The classification system upon which any CPI is built provides the structure essential for many stages of CPI compilation. Most obviously, it provides the weighting and aggregation structure, but it also provides the scheme for stratification of products in the sampling frame, at least down to a certain level of detail, and it dictates the range of sub-indices available for publication. Several factors must be taken into account when a CPI classification system is being developed.

- First, the classification must reflect economic reality. For example, it must be possible to accommodate new goods and services in a manner that minimizes the need for later restructuring of the higher-level categories. Restructuring is undesirable because many users require long time series, and restructuring of the classification will produce breaks in the series.
- Second, the needs of users for sub-indices should be given a high priority when constructing aggregate groups, so that if, for example, some users are particularly interested in price change in food products, then the classification should provide sufficient detail in that area.
- Third, it is a requirement of any classification that its categories are unambiguously mutually exclusive, and at the same time provide complete coverage of all products considered to be within its scope. In practice this means that it should be a straightforward task to assign any particular expenditure, or price, to a single category of the classification system.

3.145 The availability and nature of the data themselves will also affect the design of a classification system. The availability of expenditure and price data will dictate the lowest level of detail that might be possible. Obviously it is not possible to produce a separate index for a product for which either weights or prices are not available. At the most detailed level, a high variance of the price changes, or relatives, will suggest where additional categories are needed. In line with standard sampling procedures, the stratification scheme should minimize the within-stratum variance while at the same time maximizing the between-stratum variance. The classification should reflect this requirement.

Criteria for classifying consumption expenditure

3.146 Although a classification may be conceived according to economic theory or user requirements using a top-down approach, in practice the statistical compiler collects data about individual products and then aggregates them according to the classification scheme (a bottom-up application). For example, the units of classification for the Classification of Individual Consumption according to Purpose (COICOP) are expenditures for the acquisition of consumer goods and services, not expenditures on purposes as such. Divisions 01 to 12 of COICOP convert these basic statistics into a purpose classification by grouping together the various goods and services which are deemed to fulfil particular purposes, such as nourishing the body, protecting it against inclement weather, preventing and curing illness, acquiring knowledge, travelling from one place to another, and so on.

3.147 Classifications of expenditure data are schemes for aggregating expenditures on products according to certain theoretical or user-defined criteria, such as:

- *Product type* – products may be aggregated by:
  - physical characteristics of goods and the nature of services; for example, biscuits are divided into those with and without a chocolate coat. This criterion can be meaningfully implemented down to the most detailed level, and is the basis of the Central Product Classification 1.0 (United Nations, 1998b);
  - economic activity from which the product originated. The International Standard Industrial Classification of All Economic Activities (ISIC), Revision 3.1 (United Nations, 2002) is the international standard classification;
  - production process from which the product originated;
  - retail outlet type from which the product was purchased;
  - geographical origin of the product.
- *Purpose* to which the products are put, e.g. to provide food, shelter, transport, etc. COICOP is the international standard.
- The *economic environment*, where products could be aggregated according to criteria such as:
  - substitutability of products;
  - complementarity of products;
  - application of sales taxes, consumer subsidies, excise taxes, customs duties, etc.;
  - imports from different countries (and in some cases, a classification of exportable products may be of interest).

Classification by product type

3.148 Where indices of price change for specific products groups are required, a product-based classification would be appropriate. Product classifications may combine several of the criteria listed above; for example, the Classification of Products by Activity (CPA) in the European Economic Community (Eurostat, 1993), which is linked to the CPC at the detailed level and the ISIC at the aggregate level.

3.149 Inevitably, price collectors and index compilers will encounter products for which no detailed class or sub-class exists, for example, entirely new products, or mixed products which are bundles of existing products. This is a problem frequently encountered with high technology goods, telecommunications goods and services, and food items in the form of ''ready meals''. Initially, the expenditure on these products may be recorded in an ''other'' or n.e.c. (not elsewhere classified) class, but once expenditure on these products becomes significant, a separate class should be created.

Classification by purpose

3.150 For a CPI compiler aiming to produce a measure of the change in the cost of satisfying particular needs, a purpose-based classification is appropriate. The COICOP breakdown at the highest level is by purpose such that the 12 divisions of COICOP are categories of purpose, and below this level the groups and classes are product types. In other words, products are allocated to purpose headings. The allocation of products is complicated by the existence of multi-purpose products (single products that can be used for a variety of purposes), such as electricity, and mixed purpose (bundled) products, such as package holidays comprising transport, accommodation, meals, and so on.

3.151 *Multi-purpose goods and services*. The majority of goods and services can be unambiguously assigned to a single purpose, but some goods and services could plausibly be assigned to more than one purpose. Examples include motor fuel, which may be used to power vehicles classified as transport as well as vehicles classified as recreational, and snowmobiles and bicycles which may be bought for transport or for recreation.

3.152 In drawing up COICOP, the general rule followed has been to assign multi-purpose goods and services to the division that represents the predominant purpose. Hence, motor fuel is shown under ''Transport''. Where the predominant purpose varies between countries, multi-purpose items have been assigned to the division that represents the main purpose in the countries where the item concerned is particularly important. As a result, snowmobiles and bicycles are both assigned to ''Transport'' because this is their usual function in the regions where most of these devices are purchased – that is, North America and the Nordic countries in the case of snowmobiles, and Africa, South-East Asia, China and the low countries of Northern Europe in the case of bicycles.

3.153 Examples of other multi-purpose items in COICOP include: food consumed outside the home, which is shown under ''Hotels and restaurants'', not ''Food and non-alcoholic beverages''; camper vans, which are shown under ''Recreation and culture'', not ''Transport''; and basket-ball shoes and other sports footwear suitable for everyday or leisure wear, which are shown under ''Clothing and footwear'', not ''Recreation and culture''.

3.154 National statisticians may wish to reclassify multi-purpose items if they consider that an alternative purpose is more appropriate in their country. Such reclassifications should be footnoted.

3.155 *Mixed purpose goods and services*. Single outlays may sometimes comprise a bundle of goods and services which serve two or more different purposes. For example, the purchase of an all-inclusive package tour will include payments for transport, accommodation and catering services, while the purchase of educational services may include payments for health care, transport, accommodation, board, educational materials, and so on.

3.156 Outlays covering two or more purposes are dealt with case by case with the aim of obtaining a breakdown by purpose that is as precise as possible and consistent with practical considerations of data availability. Hence, purchases for package holidays are shown under ''Package holidays'' with no attempt to isolate separate purposes such as transport, accommodation and catering. Payments for educational services, in contrast, should as far as possible be allocated to ''Education'', ''Health'', ''Transport'', ''Hotels and restaurants'' and ''Recreation and culture''.

3.157 Two other examples of mixed purpose items are: the purchase of in-patient hospital services which include payments for medical treatment, accommodation and catering; and the purchase of transport services which include meals and accommodation in the ticket price. In both cases, there is no attempt to isolate separate purposes. Purchases of in-patient hospital services are shown under ''Hospital services'' and purchases of transport services with accommodation and catering are shown under ''Transport services''.

Classifications for consumer price indices

3.158 In practice, most countries use a hybrid classification system for their CPI in the sense that the breakdown of expenditure at the highest level is by purpose, with breakdowns by product at the lower levels. In some countries the higher-level purpose classifications were developed many years ago for CPIs that were originally devised as measures of the changing cost of a basket of goods and services that were, at the time, considered necessary for survival or maintaining some ''basic'' standard of living. Thus, the classifications were based on consumer needs, where ''need'' may have had a somewhat subjective interpretation depending on political requirements.

3.159 The recommended practice today is still to use a purpose classification at the highest level, with product breakdowns below, but to use the recently developed international standard classifications as far as possible, with adaptations to national requirements where necessary. In other words, divisions 01 to 12 of COICOP, with Central Product Classification (CPC) product classes and sub-classes mapped onto them to provide the next two levels of detail.

Publication level

3.160 As mentioned above, any restructuring of the classification of published indices will inconvenience users and should be avoided so far as possible by careful planning and development of the classification scheme in the first place. There is a trade-off between providing users with as much detail as they would like in terms of product indices and weights, and preserving some freedom to restructure the lower levels (unpublished) without apparently affecting the published series.

3.161 Item samples below the level at which weights are published can be revised between major weight revisions. As explained in Chapter 9, new and replacement items and varieties can also be introduced provided they can be included within an existing published weight. A major new product, such as a personal

computer, could only be introduced at the time of a major weight revision, whereas it might be possible to introduce mobile phones at any time if the lowest-level weight published in the telecommunications category is for telephone services.

Classification of Individual Consumption according to Purpose (COICOP)

3.162 *COICOP structure*. The international standard classification of individual consumption expenditures is the Classification of Individual Consumption according to Purpose (COICOP). COICOP is a functional classification that is also used in *SNA 1993* and covers the individual consumption expenditures incurred by three institutional sectors, i.e. households, non-profit institutions serving households (NPISHs), and general government. Individual consumption expenditures are those which benefit individual persons or households.

3.163 COICOP has 14 divisions:

– divisions 01 to 12 covering the final consumption expenditure of households;
– division 13 covering the final consumption expenditure of NPISHs;
– division 14 covering the individual consumption expenditure of general government.

The classification has three levels of detail:

– division or two-digit level, e.g. 01. Food and non-alcoholic beverages;
– group or three-digit level, e.g. 01.1 Food;
– class or four-digit level, e.g. 01.1.1 Bread and cereals.

3.164 The 12 divisions covering households consist of 47 groups and 117 classes and are listed in Annex 2. Below the level of class, CPI compilers have to create additional detail by further subdividing the classes according to their national needs. Of course, there are clear advantages, in terms of comparability between countries, and between the different uses of COICOP (CPIs, household expenditure statistics, national accounts aggregates), if the basic, higher-level structure of COICOP is maintained.

3.165 There are some COICOP classes which may, or may not, be included in most CPIs, or for which expenditure data cannot be collected directly from households. For example, COICOP has a class for the imputed rentals of owner-occupiers, which may be outside the scope of some CPIs. COICOP also has a class for financial intermediation services indirectly measured, which may be outside the scope of some CPIs because of practical measurement difficulties. In any case, the expenditures on these services cannot be collected in household budget surveys. Similarly, COICOP has a group for expenditure on insurance service charges, which may be within the scope of CPIs but cannot be measured using household surveys.

3.166 *Type of product*. COICOP classes are divided into: services (S), non-durables (ND), semi-durables (SD) and durables (D). This supplementary classification provides for other analytical applications. For example, an estimate may be required of the stock of consumer durables held by households, in which case the goods in COICOP classes that are identified as ''durables'' provide the basic elements for such estimates.

3.167 As explained above, the distinction between non-durable goods and durable goods is based on whether the goods can be used only once or whether they can be used repeatedly or continuously over a period of considerably more than one year. Moreover, durables, such as motor cars, refrigerators, washing machines and televisions, have a relatively high purchasers' value. Semi-durable goods differ from durable goods in that their expected lifetime of use, though more than one year, is often significantly shorter and their purchasers' value is substantially less. Because of the importance attached to durables, the categories of goods defined as durables in COICOP are listed below:

– furniture, furnishings, carpets and other floor coverings;
– major household appliances;
– tools and equipment for house and garden;
– therapeutic appliances and equipment;
– vehicles;
– telephone and fax equipment;
– audiovisual, photographic and information processing equipment (except recording media);
– major durables for recreation;
– electrical appliances for personal care;
– jewellery, clocks and watches.

The following goods are listed as semi-durables:

– clothing and footwear;
– household textiles;
– small electrical household appliances;
– glassware, tableware and household utensils;
– spare parts for vehicles;
– recording media;
– games, toys, hobbies, equipment for sport, camping, etc.

3.168 Some COICOP classes contain both goods and services because it is difficult for practical reasons to break them down into goods and services. Such classes are usually assigned an (S) when the service component is considered to be predominant. Similarly, there are classes which contain either both non-durable and semi-durable goods or both semi-durable and durable goods. Again, such classes are assigned a (ND), (SD) or (D) according to which type of good is considered to be the most important.

Appendix 3.1 Consumer price indices and national accounts price deflators

1. The purpose of this appendix is to explain why and how consumer price indices (CPIs) differ from the price indices used to deflate household consumption expenditures in national accounts. The differences between the two kinds of price index are often not well understood.

Coverage of households

2. The sets of households covered by CPIs and the national accounts are not intended to be the same, CPIs typically covering a smaller set of households. Household consumption expenditures in national accounts cover the expenditures made by all households, including institutional households resident in the country or region, whether those expenditures are made inside or outside the country or region of residence. CPIs tend to cover the expenditures and prices paid by households within the geographical boundaries of a country or region, whether the households are residents or visitors. More importantly, most CPIs are purposely defined to cover only selected groups of non-residential households. For example, CPIs may exclude very wealthy households or be confined to households in urban areas or headed by wage-earners.

Coverage of consumption expenditures

3. The sets of expenditures covered by CPIs and national accounts are not intended to be the same, CPIs typically covering a smaller set of expenditures. Most CPIs do not cover most of the imputed non-monetary consumption expenditures included in national accounts, either on principle or in practice because of lack of data. Many CPIs include the imputed rents on owner-occupied housing, but CPIs are not intended to cover the imputed expenditures and prices of agricultural products or other goods produced for own consumption that are included in national accounts.

Timing

4. Most CPIs measure price changes between two points of time or very short intervals of time such as a week. The price indices in national accounts are intended to deflate expenditures aggregated over long periods of time, generally a year. The ways in which monthly or quarterly CPIs are averaged to obtain annual CPI indices are unlikely to be conceptually consistent with the annual price indices in national accounts.

Index number formulae

5. The index number formulae used by CPIs and national accounts are not intended to be the same. In practice, most CPIs tend to use some kind of Lowe price index that uses the quantities of an earlier period, whereas the price indices, or price deflators, in national accounts are usually meant to be Paasche indices. Paasche indices are used in order to obtain Laspeyres volume indices. These differences, arising from the use of different index formulae, would tend to be reduced if both CPIs and national accounts adopted annual chaining.

Conclusions

6. It is clear that, in general, CPIs and the price deflators for national accounts can differ for a variety of reasons, such as major differences in the coverage of households and expenditures, differences in timing and differences in the underlying index number formulae. These differences are intentional and justified. Of course, the price data collected for CPI purposes may also be used to build up the detailed price deflators used for national accounts purposes, but at an aggregate level CPIs and national accounts deflators may be quite different for the reasons just given.