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Defining the National Accounts Framework for the ICP

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1. Introduction

1. The ICP is a major statistical exercise which requires a great deal of cooperation and coordination between price statisticians and national accountants. Inevitably, a large part of the overall work program is directed at collecting the prices required to produce PPPs at the basic heading level. A lot of effort is required to identify the representative and comparable products to be priced and then to collect the prices over the course of a year and edit them. Unfortunately, resolving all the problems that tend to arise in collecting price data can lead to the national accounts being relatively neglected. Our task is to ensure that this does not happen because the national accounts have a major impact on the overall outcomes. It is probably slightly trite to mention the old cliché of “garbage in, garbage out” but it is particularly true in the case of national accounts and the ICP because of the direct effects that errors in the national accounts data will have on the PPP-based volumes.

2. The purpose of this paper is to present broad issues relating to national accounts and the ICP and to define the national accounts framework that is going to be used in the ICP. It provides some ideas on national accounting issues that should be included as part of the final framework. A complete description of this framework and the implications for its use in the ICP will be contained in the national accounts chapter in the 2011 ICP Handbook, which should be available around the middle of 2010.

3. One question that needs to be answered is why do we need to define a national accounts framework for the ICP when the *System of National Accounts, 1993* (i.e. the “1993 SNA”) already provides the international framework for national accounts. In fact, the main output from the ICP is a set of comparable estimates of GDP expressed in a common currency for the majority of countries in the world, with the definition of GDP being consistent with that in the 1993 SNA. Therefore, it is clear the ICP uses the 1993 SNA as the national accounting framework, but there are some specific ICP requirements that mean it is necessary to make some modifications and clarifications. For example, the ICP uses a special product classification, which is required because of its use as the starting point for specifying the product lists to be priced for the ICP. In addition, a number of the GDP components pose special problems for the ICP that are less pronounced in time series and so special consideration is required for ICP purposes.

4. The 1993 SNA focuses mainly on the national accounts as time series, whereas the ICP focuses on the comparisons between countries (i.e. spatial comparisons) for a single year. It would be very useful if the prices underlying the deflators used in the time series could be used directly in the ICP but they cannot. In time series the main requirement is for consistency over time in the products being priced whereas, in the ICP, pricing products that are comparable across countries is critical.

5. Some countries do not have complete sets of national accounts and so some special consideration will be required. For example, a number of countries do not compile complete expenditure-based estimates of GDP. Some have only production-based estimates or the expenditure on GDP is incomplete with the production estimate of GDP providing a benchmark and the difference between that estimate and the expenditures that can be recorded being shown as a balancing item.

6. Experience with the 2005 ICP has shown it is highly likely that, in some countries, the ICP results will be first time any national accounts are presented for 2011. Some of these countries may be forecasting 2011 GDP using rather rudimentary methods because their underlying data sources are not available in time to meet the ICP deadlines for 2011 GDP estimates. In such cases, it will also be necessary to develop some way of breaking GDP down into basic headings. If detailed data are not available, it may even be necessary to use an updated version of the 2005 basic heading splits, with some amendments to cater for known large changes in the economy concerned between 2005 and

2011. In all these cases, special validation procedures will be required to ensure that the GDP estimates provide a reasonable picture of these countries' economies and that the prices collected for the ICP are as consistent as possible with the national accounts values. Some of these issues are mentioned in this paper, but the ICP Handbook will present more specific details, particularly underlining the main issues that national accounts experts may need to consider in producing and validating the national accounts estimates.

7. This paper contains the following sections:

Section 2: Background

Section 3: GDP and its main aggregates

Section 4: The integrated economic accounts

Section 5: Basic prices and producers' prices

Section 6: Time of recording

Section 7: Market output, output produced for own final use and other non-market output

Section 8: Expenditures, acquisitions and actual final consumption

Section 9: Valuing non-monetary transactions

Section 10: Gross capital formation

Section 11: Supply-use tables

Section 12: Time series national accounts and spatial comparisons

Section 13: Other data considerations

Section 14: Basic headings

Section 15: ICP requirements for national accounts data

Section 16: Some problem areas

Section 17: Summary

2. Background

8. A little background on the ICP is necessary to fully appreciate the uses of national accounts in the ICP. There is increasing interest in making international comparisons of the size of economies, which requires values of aggregates such as GDP (or GDP per capita) to be expressed in a common currency. Many analysts still use exchange rates to convert values from national currencies into a common international currency (typically the \$US). The main reason exchange rates are still used for this purpose, despite their shortcomings, is that they are readily available and up-to-date information can be obtained for virtually any pair of countries in the world. The 2005 ICP made a huge step forward in providing analysts with PPP-based comparisons for almost 150 countries but some analysts still do not appreciate the problems involved in using exchange rates for making international comparisons. The major flaw in using exchange rates is that they do not adjust for the differences in price levels between countries and so can lead to very misleading results. Exchange rates can also fluctuate quite markedly and so distort exchange rate based comparisons. For example, the Euro was worth \$US1.472 (monthly average) in January 2008, rose to a 2008 peak of \$US1.576 in July, fell to \$US1.275 in November and finished 2008 with a December average of \$US1.353. During 2009, the monthly averages started off at \$US1.324 in January, bottomed at \$US1.278 in February and then rose steadily during the next few months to \$US1.427 in August. It would not be possible for price levels between the USA and those European countries with the Euro as their currency to fluctuate anywhere near this extent in such a short time. Clearly, using exchange rates to convert values expressed in national currencies into a common currency at a time when exchange rates are

fluctuating to this extent would lead to quite misleading results. PPPs, though, abstract from such changes in exchange rates and so provide more meaningful international comparisons.

9. It is important to note that PPPs are useful only when combined with other data. The major use of PPPs is to apply them to values expressed in a national currency to convert them to a common currency for comparison purposes. A secondary use is to divide them by the corresponding exchange rate to derive a “price level index” (PLI), which enables countries to be compared on the basis of whether they are “expensive” or “cheap” to live in or to visit.

10. When PPPs are applied to a value in national currency to convert it into a common currency, the outcome is referred to as a “volume” or “real expenditure”. It is important to not confuse the PPP-based volumes with the more-commonly used time series volumes obtained from the national accounts. While there are some similarities between them, there are also some significant differences in the characteristics of these two sets of volume data. The ICP aims to compare the levels of activity in different countries. It differs from the more commonly used measure of changes in activity because the comparisons based on ICP data are inter-country (or “spatial”) comparisons rather than the more commonly used time series comparisons, which estimate changes over time (“temporal” comparisons).

11. The main uses of real expenditures derived using PPPs are:

- PPP-based real expenditures of GDP provide a means of comparing the relative size of economies;
- PPP-based per capita real expenditures enable broad comparisons of the degree of economic development in countries;
- similarly, PPP-based per capita real expenditures of consumption expenditures can be used as an indicator of the relative standard of living between countries;
- PPP-adjusted data can also be used for aggregating national accounts for countries to regional (or world-wide) levels of GDP and its major aggregates.

12. The national accounts directly provide the values underlying the ICP real expenditures (and per capita real expenditures) and so any shortcomings in the national accounts data will be reflected in the PPP-based real expenditures and associated estimates. An additional use of the national accounts is to provide the weights required to combine PPPs at the most detailed (“basic heading”) level to broader aggregates, up to and including GDP. The *System of National Accounts, 1993* (the “1993 SNA”) will provide the national accounting framework on which the 2011 ICP is to be compiled because the vast majority of countries will be using the 1993 SNA for their national accounts in 2011.

3. GDP and its main aggregates

13. Broadly speaking, GDP is a concept of value added (gross output less intermediate consumption) from all economic activity within an economy. There are three approaches to measuring GDP and the production measure is the one that most closely accords with the concept outlined in the previous sentence.

- The **production measure** of GDP is derived as the value of output less intermediate consumption plus any taxes less subsidies on products not already included in the value of output.
- The **expenditure measure** of GDP is derived as the sum of expenditure on final consumption plus gross capital formation plus exports less imports.

- The **income measure** of GDP is derived as compensation of employees plus gross operating surplus plus gross mixed incomes plus taxes less subsidies on both production and imports.

14. The expenditure approach is required for the ICP because the prices that are readily observable are those related to final expenditures. The main expenditure aggregates are:

- household final consumption expenditure
- NPISH final consumption expenditure
- government final consumption expenditure
- gross fixed capital formation
- change in inventories
- net acquisitions of valuables
- net international trade.

15. For ICP purposes a slightly different classification is used:

- individual consumption expenditure
 - by households
 - by NPISHs
 - by government
- collective consumption expenditure by government
- gross fixed capital formation
- change in inventories
- net acquisitions of valuables
- net international trade.

16. The value of GDP is not affected by which of the above classifications is used because the classifications simply provide a means of systematically identifying the components of GDP. The two alternatives provide a different, but consistent, view of what makes up total expenditure on GDP.

17. The reason for the different classification used by the ICP is that some goods and services, particularly in health and education, are provided to varying extents by the private sector and by government in different countries. A more consistent basis for international comparisons can be obtained by combining them into a single category, on the basis of who is using the goods or services rather than who is providing (or purchasing) them, which is the rationale for the ICP classification.

4. The integrated economic accounts

18. The 1993 SNA defines an account as a tool which records, for a given aspect of economic life, the uses and resources or the changes in assets and the changes in liabilities and/or the stock of assets and liabilities existing at a certain time.

19. Accounts can be built up for institutional units and sectors, transactions within the local economy and with the rest of the world and for assets and liabilities. The current accounts of the integrated economic accounts are presented in the following table, which is a truncated version of Table 2.8 from the 1993 SNA. The cells in which values should appear are marked by “x”. There are

five institutional sectors in the domestic economy but, for convenience of presentation, they are not shown in the following table:

- non-financial corporations;
- financial corporations;
- general government;
- household;
- non-profit institutions serving households (NPISHs).

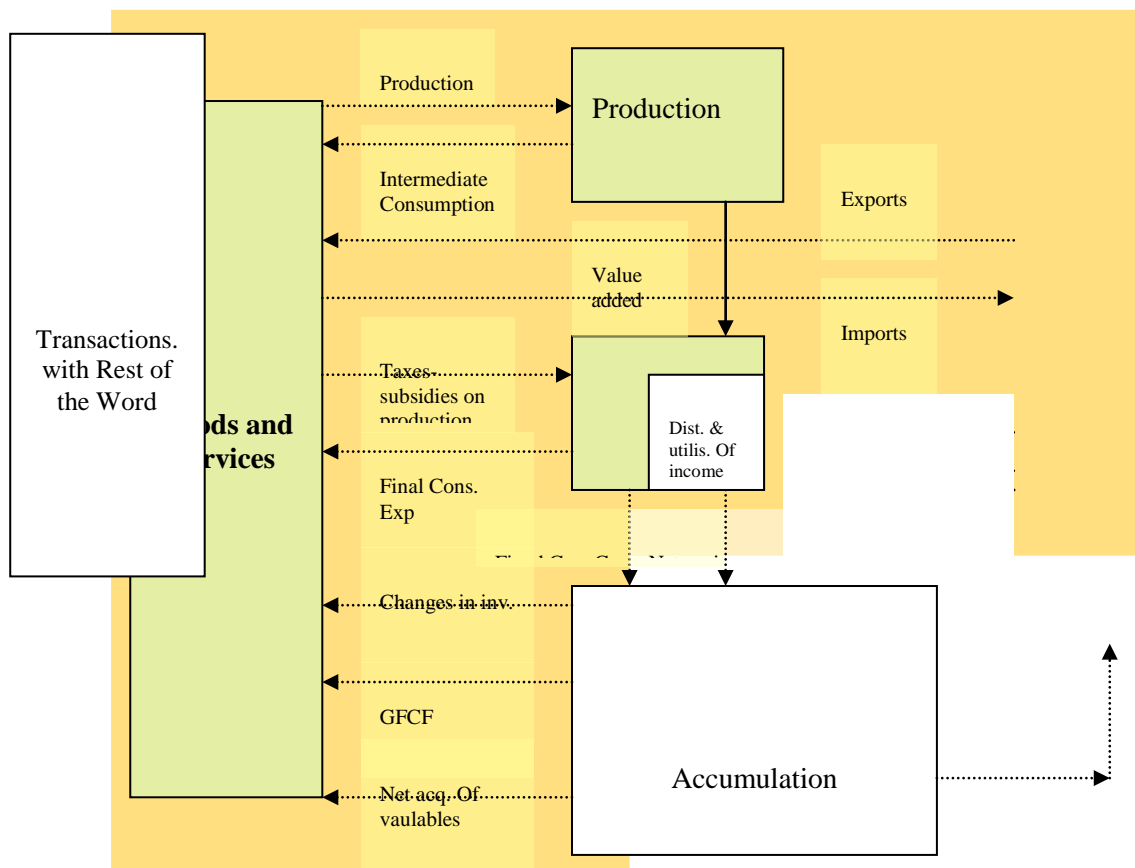
20. The importance of the institutional sectors is that they group together units that are likely to have similar factors influencing their economic behaviour.

Table 2.8 (1993 SNA): Integrated economic accounts – current accounts

Accounts	Uses				Transactions and balancing items	Resources				Accounts
	TOTAL	Goods and services	Rest of the world	Total economy		Total economy	Rest of the world	Goods and services	TOTAL	
<i>Production/external account of goods and services</i>	x	x			Imports of goods and services		x		x	<i>Production/external account of goods and services</i>
	x		x		Exports of goods and services				x	
	x	x			Output	x			x	
	x			x	Intermediate consumption			x	x	
	x	x			Taxes less subsidies on products	x			x	
	x			x	Value added, gross/Gross domestic product	x			x	
	x			x	Consumption of fixed capital				x	<i>Generation of income account</i>
	x			x	Value added net/Net domestic product	x			x	
			x		External balance of goods and services		x			<i>Allocation of primary income account</i>
<i>Generation of income account</i>	x		x	x	Compensation of employees	x	x		x	
	x		x	x	Taxes less subsidies on production and imports	x		x	x	
	x		x	x	Taxes less subsidies on products	x		x	x	
	x		x	x	Other taxes less subsidies on production	x		x	x	
	x			x	Operating surplus, gross	x			x	
	x			x	Mixed income, gross	x			x	
	x			x	Operating surplus, net	x			x	
	x			x	Mixed income, net	x			x	<i>Secondary distribution of income account</i>
<i>Allocation of primary income account</i>	x		x	x	Property income	x	x		x	
	x			x	Balance of primary incomes, gross/National income, gross	x			x	
	x			x	Balance of primary incomes, net/National income, net	x			x	<i>Redistribution of income in kind account</i>
<i>Secondary distribution of income account</i>	x		x	x	Current taxes on income, wealth etc.	x	x		x	
	x		x	x	Social contributions	x		x	x	
	x		x	x	Social benefits other than social transfers in kind	x		x	x	
	x		x	x	Other current transfers	x		x	x	
	x			x	Disposable income, gross	x			x	
	x			x	Disposable income, net	x			x	<i>Use of income account</i>
<i>Redistribution of income in kind account</i>	x			x	Social transfers in kind	x			x	
	x			x	Adjusted disposable income, gross	x			x	<i>Use of income account</i>
	x			x	Adjusted disposable income, net	x			x	
<i>Use of income account</i>					Disposable income, gross	x			x	
					Disposable income, net	x			x	
	x			x	Actual final consumption			x	x	
	x			x	Final consumption expenditure			x	x	
	x		x	x	Adjustment for change in net equity of households in pension funds	x	x		x	
	x			x	Saving, gross					
	x			x	Saving, net					
	x		x		Current external balance					

21. The above table presents, in summary form, all the current accounts in the 1993 SNA. The links between them are shown in the following diagram, which is based on Figure 2.4 in the 1993 SNA. The accounts highlighted in yellow are those that make up the framework for the 2011 ICP.

Diagram



5. Basic prices and producers' prices

22. The 1993 SNA describes two kinds of output prices; basic prices and producers' prices as:
- The basic price is the amount receivable by the producer from the purchaser for a unit of a good or service produced as output minus any tax payable, and plus any subsidy receivable, on that unit as a consequence of its production or sale. It excludes any transport charges invoiced separately by the producer.
 - The producer's price is the amount receivable by the producer from the purchaser for a unit of a good or service produced as output minus any value added tax (VAT), or similar deductible tax, invoiced to the purchaser. It excludes any transport charges invoiced separately by the producer.
23. Neither the producer's price nor the basic price includes any amounts receivable in respect of VAT, or similar deductible tax, invoiced on the output sold. Also, the amounts charged by non-market producers when they sell output at prices that are not economically significant do not constitute basic prices or producers' prices as defined above.
24. The 1993 SNA describes a third pricing basis (the purchaser's price) as the amount paid by the purchaser, excluding any deductible VAT or similar deductible tax, in order to take delivery of a unit of a good or service at the time and place required by the purchaser. The purchaser's price of a good includes any transport charges paid separately by the purchaser to take delivery at the required time and place.
25. When comparing the purchaser's price with the producer's price or basic price, it is important to specify whether they refer to the same transaction or two different transactions. For certain purposes, including input-output (or supply-use) analysis, it may be convenient to compare the price paid by the final purchaser of a good after it has passed through the wholesale and retail distribution chains with the producer's price received by its original producer. In this case the prices refer to two different transactions taking place at quite different times and locations; they must differ at least by the amount of the wholesale and retail trade margins.
26. When the prices refer to the same transaction (i.e. the purchaser buys directly from the producer) the purchaser's price may exceed the producer's price by:
- the value of any non-deductible VAT, payable by the purchaser; and
 - the value of any transport charges on a good paid separately by the purchaser and not included in the producer's price.
27. It follows that the purchaser's price may exceed the basic price by the amount of the two items just listed plus the value of any taxes less subsidies on the product (other than VAT).
28. In summary, the relationships between the different price bases are:

Basic prices

plus Taxes on products excluding invoiced VAT

less Subsidies on products

equals **Producers' prices**

plus VAT not deductible by the purchaser

plus Separately invoiced transport charges

plus Wholesalers' and retailers' margins

equals **Purchasers' prices.**

29. The importance of this section and the above definitions taken from the 1993 SNA is to ensure that the pricing basis being used in the national accounts matches exactly with that of the prices collected for the ICP. Generally, the pricing basis required will be purchasers' prices, because the expenditures recorded in the national accounts are based on the prices paid by the final users of the goods and services (e.g. households for consumption goods, businesses for capital goods). However, when collecting prices for the ICP it may not be possible to obtain prices for some products on the desired basis. Generally, the prices collected for consumer goods and services will be on the same basis as those collected for a country's CPI and so will be on the same basis as the national accounts. However, prices for capital goods are not so readily observable and it may be necessary to use proxies (e.g. the f.o.b. prices for imported equipment) and then adjust them from the observed basis to the purchaser's price required for the ICP by adding in taxes, any wholesale and retail margins, and also any transport charges paid by the purchaser.

30. In the SNA, intermediate inputs are recorded and valued at the time they enter the production process, while outputs are recorded and valued at the end of the process. Intermediate inputs are normally valued at purchasers' prices and outputs at basic prices, or alternatively at producers' prices if basic prices are not available. Gross value added is the difference between the value of the gross output and the value of the intermediate inputs. The valuation basis of the gross value added can differ, though. The importance of different valuation bases becomes apparent when supply-use tables are produced to estimate or verify values calculated using product flow (or commodity flow) techniques.

31. The 1993 SNA defines **gross value added at basic prices** as output valued at basic prices less intermediate consumption valued at purchasers' prices. Although the outputs and inputs are valued using different sets of prices, for brevity the value added is described by the prices used to value the outputs. From the point of view of the producer, purchasers' prices for inputs and basic prices for outputs represent the prices actually paid and received. Their use leads to a measure of gross value added which is particularly relevant for the producer. **Gross value added at producers' prices** is defined as output valued at producers' prices less intermediate consumption valued at purchasers' prices.

6. Time of recording

32. The SNA recommends that transactions should be recorded on an accruals basis. The 1993 SNA defines accrual accounting as recording flows at the time economic value is created, transformed, exchanged, transferred or extinguished. This means that flows which imply a change of ownership are recorded when ownership passes, services are recorded when they are provided, output at the time the products are created and intermediate consumption when materials and supplies are being used. On the other hand, cash accounting records only cash payments, at the times these payments occur. This method is widely used to record government revenues and expenditures and it is also employed for certain business purposes. Problems arise when using cash accounting in the national accounts because the times at which payments take place may diverge significantly from the related economic activities and transactions, which are the underlying activities and transactions that the SNA is attempting to measure.

33. Other issues related to the time of recording transactions arise in cases where the production takes more than one accounting period to complete (e.g. some agricultural products such as crops, and construction projects such as large building, or major equipment items such as ships). In such cases, it is necessary to calculate the value of the work completed during each accounting period and record it

as inventories of “work in progress”. More generally, inventories also record the difference between production and sales of goods in the economy. For example, if a good is produced in one period and sold in the next then it is recorded in inventories of finished goods.

7. Market output, output produced for own final use and other non-market output

34. The SNA distinguishes between market output, output produced for own final use and other non-market output.

35. **Market output** is output that is sold at prices that are economically significant or otherwise disposed of on the market, or intended for sale or disposal on the market. Prices are said to be economically significant when they have a significant influence on the amounts the producers are willing to supply and on the amounts purchasers wish to buy. Apart from certain service industries for which special conventions are adopted, the value of the market output of a producer is given by the sum of the values of the following items for the period in question:

- the total value of goods and services sold (at economically significant prices);
- the total value of goods or services bartered;
- the total value of goods or services used for payments in kind, including compensation in kind;
- the total value of goods or services supplied by one establishment to another belonging to the same market enterprise to be used as intermediate inputs;
- the total value of changes in inventories of finished goods and work-in-progress intended for one or other of the above uses.

36. **Output produced for own final use** consists of goods or services that are retained for their own final use by the owners of the enterprises in which they are produced. As corporations have no final consumption, output for own final consumption is produced only by unincorporated enterprises, for example, agricultural goods produced and consumed by members of the same household. The output of domestic and personal services produced for own consumption within households is not included, although housing services produced for own consumption by owner-occupiers and services produced on own account by employing paid domestic staff are included under this heading. Goods or services used for own gross fixed capital formation can be produced by any kind of enterprise, whether corporate or unincorporated. They include, for example, the special machine tools produced for their own use by engineering enterprises, or dwellings, or extensions to dwellings, produced by households. A wide range of construction activities may be undertaken for the purpose of own gross fixed capital formation in rural areas in some countries, including communal construction activities undertaken by groups of households. The value of output produced for own final use is given by the sum of the values of the following items for the period in question:

- the total value of goods and services produced by household enterprises and consumed by the same households;
- the total value of the fixed assets produced by an establishment that are retained within the same enterprise for use in future production (own-account gross fixed capital formation);
- the total value of changes in inventories of finished goods and work-in-progress intended for one or other of the above uses.

37. Additions to work-in-progress on structures intended for own use are treated as acquisitions of fixed assets by their producers. Goods or services produced for own final use are valued at the basic prices of similar products sold on the market or by their costs of production if no suitable basic prices are available.

38. **Other non-market output** consists of goods and individual or collective services produced by non-profit institutions serving households (NPISHs) or government that are supplied free, or at prices that are not economically significant, to other institutional units or the community as a whole. Such output may be produced for two reasons:

- it may be technically impossible to make individuals pay for collective services because their consumption cannot be monitored or controlled, so the production of such services has to be organised collectively by government units and financed out of funds other than receipts from sales, namely taxation or other government incomes;
- government units and NPISHs may also produce and supply goods or services to individual households for which they could charge but choose not to do so as a matter of social or economic policy. The most common examples are the provision of education or health services, free or at prices that are not economically significant, although other kinds of goods and services may also be supplied.

39. The value of the non-market output of a producer (other than output produced for own final use) is given by the sum of the values of the following items for the period in question:

- the total value of goods and services supplied free, or at prices that are not economically significant, to other institutional units, either individually or collectively;
- the total value of goods or services supplied by one establishment to another belonging to the same non-market producer to be used as intermediate inputs;
- the total value of changes in inventories of finished goods and work-in-progress intended for one or another of the above uses.

40. As prices that are not economically significant may reflect neither relative production costs nor relative consumer preferences, they do not provide a suitable basis for valuing the outputs of goods or services concerned. Therefore the non-market output of goods or services sold at these prices is valued in the same way as goods or services provided free, i.e. by their costs of production. Part of this output is purchased by households, the remainder constituting final consumption expenditures by government units or NPISHs.

41. The SNA explains that valuing the output of the financial sector poses particular problems because some financial intermediaries are able to provide services for which they do not charge explicitly by paying or charging different rates of interest to borrowers and lenders (and to different categories of borrowers and lenders). They pay lower rates of interest than would otherwise be the case to those who lend them money and charge higher rates of interest to those who borrow from them. The resulting net receipts of interest are used to defray their expenses and provide an operating surplus. This scheme of differential interest rates avoids the need to charge their customers individually for services provided and leads to the pattern of interest rates observed in practice. However, in this situation, the SNA must use an indirect measure (financial intermediation services indirectly measured, or FISIM) of the value of the services for which the intermediaries do not charge explicitly.

42. The 1993 SNA provides for FISIM to be recorded either as the intermediate consumption of a “nominal industry” or as being distributed in one or more ways - as intermediate consumption by enterprises, as final consumption by households, or as exports to non-residents. The treatment adopted can lead to a significant difference in the level of GDP, with the distribution of FISIM potentially leading to GDP being up to about 3% higher compared with it being treated as the intermediate consumption of a nominal industry.

43. In the 2011 ICP, national accounts estimates should be supplied with FISIM distributed, or Regional Coordinators should request the information necessary to do so. A reference PPP will be applied to FISIM, so no explicit prices are required.

8. Expenditures, acquisitions and actual final consumption

44. The 1993 SNA defines expenditures as the values of the amounts that buyers pay, or agree to pay, to sellers in exchange for goods or services that sellers provide to them or to other institutional units designated by the buyers. The SNA notes that the buyer incurring the liability to pay need not be the same unit that takes possession of the good or service. An example would be a government unit (or an NPISH) paying for health services that a non-government seller provides directly to a household.

45. The 1993 SNA goes on to explain that expenditures on goods or services occur at the times when buyers incur liabilities to sellers. These are usually the times when:

- the ownership of the good is transferred from the seller to the new owner; or
- the delivery of a service by the producer is completed to the satisfaction of the consumer.

46. The 1993 SNA considers that goods and services are acquired by institutional units when they become the new owners of the goods or when the delivery of services to them is completed. The values of the goods or services received are actually recorded as expenditures by the institutional units or sectors that acquire them. The times at which goods and services are acquired are when the change of ownership occurs or the delivery of the services is completed. Acquisitions are valued at the prices paid by the units that incur the expenditures.

47. The 1993 SNA defines a consumption good or service as one that is used (without further transformation in production) by households, NPISHs or government units for the direct satisfaction of individual needs or wants or the collective needs of members of the community. It goes on to distinguish between an individual consumption good or service (i.e. one that is acquired by a household and used to satisfy the needs and wants of members of that household) and a collective consumption service, which is a service provided simultaneously to all members of the community or to all members of a particular section of the community, such as all households living in a particular region. Collective services are automatically acquired and consumed by all members of the community, or group of households in question, without any action on their part. Typical examples are public administration and the provision of security, either at a national or local level. By their nature, collective services cannot be sold to individuals on the market, and they are financed by general government units out of taxation or other incomes.

48. It is important for ICP purposes to consider the special case of acquisition for purposes of final consumption, which leads to the concept of actual final consumption.. The total value of goods and services acquired by households for purposes of final consumption is described as actual final consumption of households; it includes goods and services used by, but not directly purchased by, the final user. The 1993 SNA defines actual final consumption of households as the value of the consumption goods and services acquired by households, whether by purchase in general, or by transfer from government units or NPISHs, and used by them for the satisfaction of their needs and wants; it is derived from their final consumption expenditure by adding the value of social transfers in kind receivable. NPISHs do not have any actual final consumption because most of their services are individual in nature and so, for simplicity, all services provided by NPISHs are treated by convention as individual (as social transfers in kind). On the other hand, government units do have actual final consumption expenditures. The 1993 SNA defines actual final consumption of general government as the value of the collective (as opposed to individual) consumption services provided to the community, or large sections of the community, by general government; it is derived from their final consumption expenditure by subtracting the value of social transfers in kind payable.

9. Valuing non-monetary transactions

49. Some goods and services are acquired without any payment involved. Examples include barter, expenditures on goods and services received as income in kind and expenditures on goods and

services produced on own account. For national accounting purposes it is necessary to impute values to all these types of transactions to ensure that GDP measures the value of all the production in the economy.

50. Barter transactions should be valued at the market value of the goods or services exchanged. If the goods or services exchanged are not of equal value then the average market value of the goods or services involved should be used.

51. Employers sometimes partly pay their employees indirectly, through income in kind (e.g. use of a company car for private purposes, membership of a club, or children's school fees). The value of such income in kind should be recorded as part of the employee's wages and also as part of the employee's final consumption expenditure.

52. The production of goods and services on own account can be split into two components – those that need to be included (via imputed values) in the national accounts and those that are excluded. The production of household services that are consumed within the household is specifically excluded. They include services such as cooking food (although the cost of the food items themselves must be included), washing, ironing etc. Housing services provided to the owner-occupiers of a dwelling, though, are included in GDP (via an imputed value) as are services produced by paid domestic staff (e.g. a cook or a gardener). Household final consumption expenditure also includes the values of goods and services produced by unincorporated enterprises owned by households and which are consumed by members of the household that owns the unincorporated enterprise (e.g. food produced for own final consumption by farmers).

53. Values are imputed for these goods or services based on the prices of similar goods or services sold on the market, or by the costs of production when suitable prices are not available. For the ICP, it is important to ensure that the same pricing basis is used in calculating PPPs as that underlying the national accounts values. A particular problem area is that of the imputed rent of owner-occupied dwellings. The experience in previous ICP rounds has been that major inconsistencies have arisen between the prices underlying the imputed values of rents for owner-occupied dwellings and the prices supplied for calculating PPPs in the ICP. The values of rents are typically calculated by applying market rent prices observed from the rental sector to equivalent houses that are owner-occupied. Problems arise in countries that do not have a well-developed and broadly based rental sector (e.g. the rental sector might be mainly confined to the higher-priced part of the rental market, such as expatriates working in the country for a relatively short time).

54. A different approach was attempted in the 2005 ICP, using a questionnaire to obtain details of the numbers of dwellings, classified by type, size, locality, region and facilities available (electricity, inside water, private toilet) underlying the values in the national accounts. However, while such an approach is useful in obtaining better estimates of the real expenditures on dwellings, the cost is that the PPPs have to be derived implicitly and they will contain any errors that arise from inconsistencies between the prices and the quantities underlying the national accounts values.

10. Gross capital formation

55. Gross capital formation consists of gross fixed capital formation, changes in inventories and net acquisitions of valuables.

56. The 1993 SNA defines gross fixed capital formation as the total value of a producer's acquisitions, less disposals, of fixed assets during the accounting period plus certain additions to the value of non-produced assets realised by the productive activity of institutional units. Fixed assets are tangible or intangible assets produced as outputs from processes of production that are themselves used repeatedly or continuously in other processes of production for more than one year. Examples of gross fixed capital formation are the acquisition of buildings, including dwellings, machinery and equipment, mineral exploration, and computer software. It is important to note that the 1993 SNA

does not include expenditure on research and development (R&D), although a change was made in the 2008 SNA to include such expenditures as capital formation.

57. New fixed assets purchased are valued at purchasers' prices, so the prices obtained for the ICP should include all transport and installation charges as well as any costs incurred in the transfer of ownership, such as fees paid to surveyors, engineers, architects, lawyers, estate agents, etc., and any taxes payable on the transfer. Fixed assets produced for own gross fixed capital should be valued at their estimated basic prices, or by their costs of production when satisfactory estimates of their basic prices cannot be made. Purchases of existing fixed assets are valued including all transport, installation and other costs of ownership transfer incurred by the purchaser while sales of existing fixed assets are valued after deducting any costs of ownership transfer incurred by the seller.

58. The value of changes in inventories is the value of the inventories acquired less the value of the inventories disposed of during an accounting period. Some of these acquisitions and disposals are attributable to actual purchases or sales, but others reflect transactions that are internal to the enterprise (i.e. an increase in inventories of finished goods attributable to production being greater than sales of those goods). In concept, inventories are valued in the same way as other assets, but the process is complicated by the starting point for measuring inventories being the difference in their values between the end and the beginning of the accounting period. In the ICP, a reference PPP will be used for inventories.

59. Valuables are assets that are acquired and held primarily as stores of value. They are not used for production or consumption, they do not deteriorate over time under normal conditions and they are generally held in the expectation that their prices will increase over time, at least in the longer term. Examples are jewellery, diamonds, gold, works of art and antiques. A reference PPP will be used for valuables in the 2011 ICP.

11. Supply-use tables

60. Supply-use tables have a number of important uses in the national accounts. They focus on the goods and services account and enable national accounts compilers to compare data from different sources (e.g. production, international trade, household expenditures, investment) to check their consistency. They also provide information that makes it possible to impute estimates of a national accounts aggregate when there are no data available directly related to that aggregate. For example, in the absence of a survey of expenditure on investment goods, it is possible to use details of the domestic production of particular types of equipment in conjunction with data on their imports to estimate the gross fixed capital expenditure on those types of equipment. For the ICP an important aspect of supply-use tables is their potential for estimating coherent values at the basic heading level.

61. The goods and services account shows how the total supply of a product is equal to the total amount used:

- Output + imports (i.e. total supply) =
- intermediate consumption + exports + final consumption + gross capital formation (i.e. total uses).

62. In effect, goods and services are tracked through the economy from their original producers (either resident or abroad) to their users (either resident or abroad).

63. Paragraph 14.13 of the 2008 SNA provides a succinct summary of supply-use tables:

- 14.13 With a complete set of product balances, supply and use tables can be created. Supply and use tables exist in pairs with common valuation and level of detail as regards the products identified. The most common format of supply and use tables is at purchasers' prices. A use table at purchasers' prices consists of a set of product balances covering all products available in an economy arranged in the form of a rectangular matrix with the

products, valued at purchasers' prices, appearing in the rows and the columns indicating the disposition of the products to various types of uses. A supply table at purchasers' prices consists of a rectangular matrix with the rows corresponding to the same groups of products as the matching use tables and columns corresponding to the supply from domestic production valued at basic prices plus columns for imports and the valuation adjustments necessary to have total supply of each [group of] product[s] valued at purchasers' prices.

64. Compiling detailed flows along these lines is called the commodity-flow (or product-flow) method. The commodity-flow method is a useful editing tool when independent estimates can be made for each of the items in the above equation. Supply-use tables rarely balance during the first iteration. However, they do provide indications of those parts of the accounts where the greatest tensions are arising in the data. Adjustments are made to the data progressively until the expenditure and production based estimates of GDP are equal.

65. In some cases, the supply-use table provides a framework for one of the components to be derived residually because of the lack of complete data, so the supply-use table becomes a means of data estimation rather than an editing tool. Generally it will be one of the uses, with components of gross capital formation, particularly its changes in inventories component, that is estimated residually.

66. The supply-use table can be expressed in volume terms as well as in current prices. As is the case with the commodity-flow method in current price terms, commodity balances can be checked in volume terms. If the starting point is a supply-use table that is balanced in value terms then any discrepancies arising in the supply-use table expressed in terms of volumes are due to inconsistencies in the price deflators used to estimate the volumes.

67. Numerical examples of various aspects of supply-use tables are provided in chapter 15 of the 1993 SNA.

12. Time series national accounts and spatial comparisons

68. A section in chapter 15 of the 2008 SNA headed "Practical considerations for national accountants" provides some very useful information for those who are going to be involved in the ICP. The following paragraphs summarise the details contained in paragraphs 15.224 to 15.238 of the 2008 SNA.

69. The national accounts are important to the ICP because they provide the values that are "deflated" by PPPs to provide the real expenditures expressed in a common currency that enable GDP and its expenditure components to be compared between countries. The lowest level for which PPPs can be compared across all countries involved in a comparison is referred to as the "basic heading" and it is also the lowest level for which national accounts values are required. The basic heading values also provide the weights underlying the process of aggregating PPPs to levels above the basic heading (including GDP itself).

70. The ICP also produces comparative price level indices (PLI). A PLI is the ratio of the PPP for a country relative to the official exchange rate, both measured with respect to a reference currency. PLIs are generally expressed on a base of 100, with the base being either a single reference country or a regional average. If one country has a PLI less than another, then the country with the lower PLI would be considered "cheap" by visitors from that other country. In practice, PPPs do not change rapidly over time and so a large change in a country's PLI is usually due to a large change in exchange rates.

71. It is important that the real expenditures in the ICP should not be confused with the time series volumes because they are different measures, although there are some similarities in that they are both designed to measure values that have had the direct effects of price differences removed from them.

In a time series of volumes, the effects of price changes from one period to another are removed to produce the volume measures from which rates of economic growth are calculated. In the case of an inter-country comparison, such as the ICP, the effects of differences due to exchange rates and those due to different price levels within each country are removed from the national accounts values to provide a comparison between the real expenditures in the countries concerned.

72. The real expenditure estimates produced from the ICP present a snapshot for a single year of the relationships between countries from all over the world, expressed in a common currency. PPP benchmarks from the ICP are available only once every several years and so they have to be extrapolated using time series from the national accounts of the countries involved. The method commonly used to extrapolate PPPs from their benchmark year to another year is to use the ratio of the national accounts deflators from each country compared with a numeraire country (generally the United States of America) to move each country's PPPs forward from the benchmark. The PPPs derived are then applied to the relevant national accounts component to obtain real expenditures expressed in a common currency for the year in question.

73. Theoretically, the best means of extrapolating PPPs from a benchmark year would be to use time series of prices at the individual product level from each country to extrapolate the prices of the individual products included in the ICP benchmark but, in practice, the detailed price data needed are not available. Therefore, an approach based on extrapolating at a macro level (for GDP or for a handful of components of GDP) is generally adopted. In practice, the extrapolated series of PPPs do not tie in exactly with the benchmarks. One reason is the issue of the consistency between the prices used in the time series national accounts and those used in calculating PPPs. Another problem is that the weighting patterns underlying the deflators in the time series national accounts will differ from those in the PPP benchmarks over time. A third problem is that, conceptually, extrapolating PPPs using time series of prices at a broad level such as GDP will not result in a match with the benchmark PPP-based estimates even if all the data are perfectly consistent, except under very restrictive and unrealistic conditions. Finally and often most critically, the prices underlying the deflators in the national accounts are adjusted to remove changes in quality over time and the methods of making such quality adjustments can differ significantly between countries. In particular, the extent of using hedonic methods for adjusting products whose characteristics change rapidly varies significantly from country to country. Electronic products (such as computers) feature prominently in hedonic quality adjustment, although some countries also use hedonics to quality adjust products such as clothing and housing. Comparing price changes in a country that uses hedonics in quality adjusting the price indices underlying its national accounts deflators with those in one that does not do so will lead to potentially large inconsistencies between the benchmarks and the extrapolated series.

74. There is also a conceptual inconsistency in the extrapolation technique used. GDP volume measures in the national accounts are unaffected by changes in the terms of trade whereas they directly influence real GDP in spatial comparisons. For example, an increase in energy prices results in an increase in nominal GDP. In a spatial comparison, the outcome will be an increase in GDP real expenditures for energy exporting countries relative to other countries because the net trade PPPs are based on exchange rates, which do not respond to a change in the terms of trade to a significant extent in the short term. The result is that the increase in the terms of trade is treated as a volume effect in the PPP-based benchmark. On the other hand, in the national accounts of energy exporting countries, GDP volumes remain unchanged if the same amount of energy is exported and so the increase in the terms of trade is treated as a price effect, which is observed in the GDP deflator used as the price extrapolator.

75. Pricing non-market services in the ICP can also affect the quality of the PPPs. The value of output for non-market services is measured as the sum of the labour and material inputs used in producing them which, in the ICP, involves an assumption that productivity is identical in all the countries involved. It may be a reasonable assumption when countries are at roughly the same level of economic but not so when countries at very different levels of economic development are being compared. The choices in the ICP are either to assume that productivity levels are identical across countries, even when they are at very different stages of economic development, or to adjust the non-market services estimates in some way to account for productivity differences, with all the associated

data problems. Despite the problems, it is sometimes necessary to make productivity adjustments for non-market services because the problems involved in doing so are rather less than the consequences of assuming equal productivity in all the countries in a comparison.

13. Other data considerations

76. One of the national accounts issues that needs to be considered for the ICP relates to handling data revisions. National accounts data for the 2011 ICP will be collected systematically between 2010 and 2012 to assist in validating the prices collected. The issue of revisions to the accounts will need to be addressed, particularly for the 2011 data, which will be used in compiling the final ICP results. Broadly speaking, the ICP will aim to maintain consistency to the greatest extent possible with the national accounts estimates supplied in the annual national accounts questionnaire and stored in the UNSD's national accounts database.

77. The major source for the national accounts estimates of government final consumption expenditure is government finance data, which are often compiled on a cash basis rather than the accruals basis recommended by the SNA. Ideally, all countries should report their entire accounts on an accruals basis and they will be encouraged to do so for ICP purposes.

78. Government final consumption expenditure mainly consists of the value of general government output of goods and services. In many cases, there is no observable value for such output because it is not sold at economically significant prices. Therefore, by convention, it is measured as the sum of wages and the materials inputs involved in producing the output. Government final consumption expenditure is then estimated by deducting the value of any receipts from sales and the value of production for own capital formation.

79. Non-profit institutions (NPIs) produce goods and services, mostly services, for consumption by other institutional units, mainly households but sometimes by businesses. The key characteristic of an NPI is that it cannot be a source of income or profit for the unit(s) that finances and/or controls it, i.e. if an NPI does make a profit then it cannot distribute this profit to other persons or units. NPIs are often exempt from paying taxes, particularly those that have been established for charitable purposes. Typically, NPIs are non-market but this is not universal because some NPIs provide services to corporations.

80. NPIs that produce services for corporations typically charge membership fees (sometimes described as subscriptions) that are intended to cover costs of the services they provide to members. In such cases, these NPIs are considered to be part of the corporations sector. Others are financed entirely, or mainly, by government and so are classified as part of the general government sector. The remainder are included in a special sector, the non-profit institutions serving households (NPISHs).

81. As far as the ICP is concerned, it is not essential to specifically identify the value of sales by NPIs. These values are included in final consumption expenditures, either of households, NPISHs or government, with the value being part of the relevant product category. Any sales by NPIs serving the corporations sector would appear as part of intermediate consumption and so would not be considered in the ICP. In many countries, NPISHs are combined with the household sector because their activities are so closely linked with households. However, from an ICP point of view it would be useful to be able to identify the products that are typically provided by NPIs so that analysts who are interested in NPIs could combine product-based PPPs to produce NPI-specific PPPs.

82. Agricultural production can be very important for the ICP because of the level of subsistence agriculture in many countries. Even in countries which do not have a significant subsistence sector, the consumption of own-production by farmers can be sufficiently large for specific estimates to be made and included in household final consumption expenditure and GDP. The market price that should be imputed to own account production is the price that would be paid for the produce at the farm gate (i.e. excluding transport costs and traders' margins).

83. The data sources for household final consumption expenditure generally cannot distinguish whether goods and services are purchased by residents or non-residents. In addition, it is necessary to check the balance of payments data to determine the level of purchases by residents abroad. As a result, many countries make an adjustment for “net purchases abroad” in their household final consumption expenditure rather than allocating such expenditures to the relevant product groups in household final consumption expenditure. For the ICP, it is important to treat this adjustment consistently for all countries. Ideally, the adjustment should be allocated across household final consumption expenditure by type of product. If it is not possible to do so, then it will be necessary to extract the sales by non-residents in the local economy and by residents abroad from the relevant product categories and estimate net purchases abroad to maintain consistency between countries in calculating PPPs.

84. A final point to note is the different treatment of some durable goods, depending on whether they are purchased by households or by businesses. An example is motor vehicles, which are treated as investment if purchased by businesses (and so are included as part of gross fixed capital formation) but as part of household final consumption expenditure if purchased by households. In this latter case, the treatment assumes that cars are fully depreciated in the period in which they are purchased, and they are referred to as “consumer durables”. Other products treated as consumer durables when purchased by households are household appliances such as stoves, refrigerators and air conditioners. The implications for the IPC are relatively minimal because the prices required in both cases are purchasers’ prices. However, it is important to note that there may be a different tax treatment of products such as cars depending on whether they are purchased by households or by businesses and so the ICP prices for consumption and investment should reflect any such differences.

14. Basic headings

85. Very detailed national accounts data are required for the ICP. The most detailed level at which national accounts data are required is referred to as the “basic heading”. There were 155 basic headings identified in the 2005 ICP, although some regions included additional basic headings for their own purposes. No decision has been made yet on the number of basic headings to be used in the 2011 ICP. The 155 basic headings used in the 2005 ICP are being analysed using the 2005 results to assess the extent to which the basic headings may need to be redefined to ensure robust volume measures can be calculated for the main national accounts aggregates in 2011.

2005		ICP
Distribution of basic headings		
Aggregate	Number of Basic Headings	
Individual consumption expenditure	132	
<i>by households</i>	<i>110</i>	
<i>by NPISHs</i>	<i>1</i>	
<i>by government</i>	<i>21</i>	
Collective consumption expenditure by government	5	
Gross fixed capital formation	12	
Change in inventories	2	
Net acquisitions of valuables	2	
Net international trade	2	
Gross domestic product	155	

86. The Global Office will be responsible for defining the basic headings for 2011. A key element flowing from the decision will be to maintain consistency between the basic headings set out by the Global Office and those used in each region. As a result, the Global Office will be taking account of specific regional requirements to the extent possible but it may still be necessary, in a limited number of cases, for some regions to specify additional basic headings. An important issue is that any such region-specific basic headings should be only a more detailed dissection of a world-wide basic heading. In other words, regional basic headings must not cut across the world-wide basic headings.

87. Basic headings are often considered as simply being the building blocks for the national accounts but they also perform a number of other, important functions. They provide the starting point for developing pricing lists because they define the level at which prices for products (i.e. the goods and services specified as being representative in a region) must be available. Ideally, each country should price at least one, and preferably more than one, of the specified products within each basic heading. On the other hand, it is important to note that not every specified product has to be priced. A balance is required between comparability and representativity in the products that are priced, and pricing too many non-representative products can distort the links between the national accounts and the PPPs. However, some non-representative products need to be priced at times to ensure adequate coverage of priced products between countries.

88. Other important uses of basic headings are to provide the starting point for calculating PPPs and in editing the data collected for the ICP, including prices. PPPs, volumes and per capita volumes at the basic heading level are key variables in the validation process, particularly in verifying the price data. Despite the noise in the data at this detailed level, very useful insights can be obtained into the accuracy of both the prices and the national accounts estimates by comparing various data items across countries. As was the case in the 2005 ICP, PPPs for all the basic headings will be aggregated to the broader national accounts aggregates (including GDP) for publication.

89. National accounts values are required for all basic headings. Zero values for basic headings lead to distorted PPPs and volumes at aggregate levels because the PPPs for basic headings with zero values are excluded from the broader aggregates. If countries do not supply basic heading values, the regional coordinators will have to guesstimate them because they cannot leave them as zero (unless, of course, there is genuinely no expenditure at all in a particular basic heading in a country). Clearly, individual countries are in a better position than the regional coordinators to make such guesstimates. Even if the data on which countries make an estimate are poor, it is better to make an informed guesstimate than to use something like an even split of the values at the next highest level. Possible means of estimating basic heading values would be to use an old expenditure split (preferably with price changes updated), or weights from price indices such as the CPI or, as a last resort, split broader expenditures to basic heading expenditures in the same proportions as countries with a similar type of economy.

15. ICP requirements for national accounts data

90. It has already been emphasised that the ICP is a joint exercise, with national accountants and prices statisticians both having key roles. Prices statisticians provide the prices to calculate PPPs at the basic heading level while national accountants provide the values needed to calculate volumes at this level and to weight together basic heading PPPs to derive PPPs for broader aggregates.

91. The main objective of the ICP is to compare the real GDP (and per capita real GDP) of participating countries. The starting point is to have reliable and consistent estimates of the level of GDP in the national currency of each participating country. The Regional Coordinators will have to act in conjunction with each country's national accountants to ensure their region's accounts are suitable for the ICP. The conceptual framework for the 2011 ICP will be the 1993 SNA.

92. Comparability of the national accounts estimates is paramount in the ICP, so the estimates of GDP must be "exhaustive", which means all economic activities have to be included, whether legal or

not. In ensuring that the GDP estimates are exhaustive, it may be worthwhile for regional coordinators to look closely at the following areas, which experience has shown can be under-estimated in (or even omitted from) countries' accounts:

- crops and livestock for own consumption;
- legal “underground” activities, such as
 - open markets;
 - street traders;
 - itinerant vendors;
 - construction workers;
 - informal taxis;
 - vehicle repairers;
 - informal personal services;
 - shuttle trade;
- significant illegal activities, such as
 - prostitution;
 - drugs;
 - smuggling.

93. It has already been mentioned that the ICP national accounts classification of expenditures differs from the standard national accounts presentation. In particular, the ICP uses the concept of actual final consumption which is based on who consumes a service rather than on who pays for it. However, the basic heading values **supplied** by countries will be based on final consumption expenditures by households, NPISHs and government (i.e. the standard SNA classification). The regional coordinating agencies will be responsible for deriving expenditures according to the ICP classification.

16. Some problem areas

94. In collecting prices, several areas are referred to as being “comparison-resistant” because of the difficulty involved in specifying and obtaining prices that are considered representative in each country and comparable between them. They include housing, health, government consumption, imputed dwelling rents of owner-occupiers, non-residential construction, and machinery and equipment, some of which have already been mentioned above.

95. These comparison-resistant components also feature prominently in the list of national accounts components for which special efforts are required to ensure consistency between the valuation basis of the national accounts estimates and the prices used in calculating PPPs. Additional areas affected by potential inconsistencies between the national accounts values and the prices being used in calculating the PPPs are:

- purchase of motor vehicles;
- goods produced for own consumption;
- goods and services provided as income in kind;
- individual consumption expenditure of NPISH output.

96. Some national accountants may be surprised by some of the omissions from this list. Typically, in national accounting, it is a difficult process to obtain values for inventories and for the acquisition

of valuables and also to collect the prices needed for deflating them. However, an indirect approach is adopted in the ICP to produce PPPs for these aggregates. PPP-based volumes for inventories and valuables are based on indirect PPPs rather than prices specifically relating to the basic headings underlying these aggregates. These indirect PPPs are called “reference PPPs”, which are defined as PPPs that are based on prices collected for other basic headings. In the 2005 ICP, the reference PPPs were region-specific. As an example, the reference PPPs for inventories in the Asia-Pacific region were based on PPPs for durable and non-durable goods while those for valuables came from gross fixed capital formation (excluding reference PPP basic headings). In all regions, the reference PPPs for exports and imports of goods and services were exchange rates.

97. Volumes for a number of other aggregates will also be based on reference PPPs in the 2011 ICP. However, they are less indirectly related ones than those described above (e.g. PPPs for capital expenditure on other transport equipment are based on a weighted average of PPPs for major products of transport equipment).

17. Summary

98. In summary, the following points should be emphasised:

- the accuracy of the national accounts estimates is critical for the ICP;
- the national accounts data required for the 2011 ICP are those for the expenditure components of the national accounts, based on the concepts described in the 1993 SNA;
- it is important that countries provide data for all basic headings (excluding any that are legitimately zero in a particular country), even if some are based on nothing better than the best judgement of a country’s national accountants;
- basic heading volumes and per capita volumes are important in editing both the basic heading values reported by countries and the prices at the basic heading level;
- national accounts expenditures directly affect the volume estimates and they should be supplied and edited with this in mind;
- national accounts values also provide the weights used to combine basic heading PPPs to those for broader aggregates, up to and including GDP;
- close liaison is required between national accountants and the prices statisticians providing the price data for the ICP to ensure consistency between the pricing basis underlying the national accounts values and the prices being used to calculate PPPs.