

Chapter 2

CONCEPTUAL FRAMEWORK

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2. CONCEPTUAL FRAMEWORK

2.1. Introduction

2.1. This chapter provides the basic knowledge to support the first line of action in the strategy for NOE measurement, namely establishing an appropriate conceptual framework. The chapter describes the concepts, definitions, classifications, and accounting rules of the 1993 SNA and other international standards that enable the NOE problem areas to be systematically defined and analysed in Chapter 3.

2.2. In the context of the NOE, the most relevant elements of the 1993 SNA concern the measurement of GDP. Three approaches to measuring GDP can be distinguished: the production approach, the expenditure approach and the income approach. In the production approach the starting point is to measure output and intermediate consumption of goods and services, obtain value added as the difference between output and intermediate consumption, and sum the values added by different producers to obtain GDP. In the expenditure approach, GDP is measured as the sum of expenditure components (namely, final consumption expenditure, gross capital formation and net exports). The income approach directly measures the income arising from production – largely the wages paid to employees and the operating surplus/mixed income coming from productive activities. The distinction between these three approaches is somewhat artificial because they are seldom used completely independently from each other as they often share the same basic data. In practice, national accounts compilation is often a patchwork, with some elements estimated from the production approach, others from the expenditure approach, and still others from the income approach.

2.3. Using the three approaches in conjunction also helps to alleviate their individual, inherent weaknesses. Bloem *et al.* (2001) provide details. In particular, combining data from the production side with data from the expenditure side through the commodity flow method or in a supply and use framework has proved to be a useful tool to check data and to generate estimates for missing items, including non-observed production, as further elaborated in Chapter 5.

2.4. Because the Handbook focuses on exhaustive measurement of GDP, this chapter is concerned with those aspects of the 1993 SNA that have a direct bearing on GDP and the ways in which it can be measured. Section 2.2 describes the SNA production boundary; Section 2.3 introduces the concepts of transactions and other flows; Section 2.4 deals with the units involved in production and their classification by sector and economic activity; Section 2.5 defines the economic territory of a country; Section 2.6 discusses price and volume measures; Section 2.7 introduces labour related concepts; and Sections 2.8, 2.9, and 2.10 describe compilation of the accounts using production, expenditure and income approaches, respectively.

2.2. Production Boundaries

2.5. One of the key concepts in the national accounts is that of production. The rules that have been developed to determine what is to be included as production and what is to be excluded – referred to as the *production boundary* – determine the scope of most current and capital transactions in the national accounts. First of all, the production boundary determines what is to be included in the accounts as output. Secondly, because the 1993 SNA recognises only uses of *produced* goods and services, the boundary also determines the scope of intermediate consumption, and thus, value added. For the

same reason, the production boundary also determines what is to be included as household consumption and other final uses. Furthermore, because the 1993 SNA recognises only incomes generated through the production process, the production boundary also determines what should be included as income. Primary income is derived by the distribution of value added components (in particular, wages and salaries, and operating surplus and mixed income) on the basis of input of labour and capital. Disposable income is derived from primary incomes through the redistribution process (mainly through taxes, social contributions, and social benefits). Finally, the production boundary also determines what is saving (which is the difference between disposable income and final consumption) and net lending and borrowing (which is the final balance of the current and capital accounts).

2.6. Because of the far-reaching importance of the production concept, the quality of national accounts is to a large extent determined by the exhaustiveness of the GDP estimates. To achieve exhaustiveness, the first step is the delineation of what should and should not be included in national accounts as production. In the first place, a boundary must be defined between those activities that are regarded as *productive* in an economic sense and those that are not. The second step is to define the boundary around the economic production that needs to be included in the national accounts. For several reasons that will be mentioned below, not all productive activities are included. With respect to productive activities, the 1993 SNA thus introduces two fundamental boundaries, namely the *general production boundary* and the *SNA production boundary*.

2.7. The *general production boundary* draws the line between economic and non-economic production. Economic production includes all activities “carried out under the control and responsibility of an institutional unit that uses inputs of labour, capital, and goods and services to produce outputs of goods or services... of a kind that can be delivered or provided to other institutional units” (1993 SNA: 6.15 and 6.6). In short, it includes any human controlled activity resulting in outputs capable of being exchanged. For an activity to be productive in this sense, the following conditions need to be satisfied:

- There must be a link between the activity and an institutional unit. The activity must be carried out “under the control and responsibility of an institutional unit exercising ownership rights on what is produced” (1993 SNA: 6.15). As a consequence, purely natural processes without any human involvement or direction are excluded. For example, the unmanaged growth of fish stocks is outside this general boundary, whereas fish farming is included.
- There must be marketability (resulting in outputs capable of being exchanged). This is a weak criterion in the sense that being actually exchanged is not required as long as outputs are capable of being exchanged. Thus, production for own final use is included. Marketability also implies observance of the so-called *third-party criterion*, which states that an activity may be deemed economically productive only if it can be performed by a person other than the one benefiting from it. By this criterion, basic human activities such as eating, drinking, sleeping, taking exercise, etc. are excluded, whereas services such as washing, preparing meals, caring for children, the sick or aged fall within this general boundary because they can be exchanged between different units (1993 SNA: 6.16).

2.8. The *SNA production boundary* is more restricted than the general boundary. It describes the range of productive economic activities that should be included in GDP estimates and is thus the boundary relevant to considerations of exhaustiveness. Activities included within the boundary are summarised as follows (1993 SNA: 6.18):

- a) the production of all individual or collective goods or services that are supplied to units other than their producers, or intended to be so supplied, including the production of goods and services used up in the process of producing such goods or services;
- b) the own-account production of all goods that are retained by their producers for their own final consumption or gross capital formation;
- c) the own-account production of housing services by owner-occupiers and of domestic and personal services produced by employing paid domestic staff.

2.9. Regarding item (b) the 1993 SNA (Para 6.24) provides the following list of the most common types of production, that are included irrespective of whether or not they are intended for own final use:

- The production of agricultural products and their subsequent storage; the gathering of berries or other uncultivated crops; forestry; wood-cutting and the collection of firewood; hunting and fishing.
- The production of other primary products such as mining salt, peat extraction, and the supply of water.
- The processing of agricultural products; the production of grain by threshing; the production of flour by milling; the curing of skins and the production of leather; the production and preservation of meat and fish products; the preservation of fruit by drying, bottling, etc.; the production of dairy products such as butter or cheese; the production of beer, wine, or spirits; the production of baskets or mats, etc.
- Other kinds of processing such as weaving cloth; dress making and tailoring; the production of footwear, pottery, utensils or durables; making furniture or furnishings, etc.

2.10. To decide in practice whether or not to record the production of a good within households, the 1993 SNA (Para 6.25) suggests adoption of a criterion of *significance*, meaning that if the amount produced is believed to be quantitatively important in relation to the total supply of that good in the country, then it should be estimated.

2.11. The production of *services* for own final use by households is excluded from the accounts, with the exceptions mentioned in item *c*) of Paragraph 2.8 above. In particular, the 1993 SNA (Para 6.20) lists the domestic and personal services that are specifically excluded when produced and consumed within the same household, namely:

- the cleaning, decoration and maintenance of the dwelling occupied by the household, including small repairs of a kind usually carried out by tenants as well as owners;
- the cleaning, servicing and repair of household durables, including vehicles used for household purposes;
- the preparation and serving of meals; the care, training and instruction of children;
- the care of sick, infirm or old people;
- the transportation of members of the household or their goods.

2.12. The 1993 SNA provides additional guidance regarding some “service like” activities. Major repairs to dwellings of the kind that a landlord would perform are included within the production boundary as gross fixed capital formation. Water carrying is regarded as part of the supply of water. The storage of crops produced by households for their own use is also included as an extension of the goods producing process. On the other hand, small-scale do-it-yourself repairs and maintenance to dwellings and consumer durables are excluded.

2.13. The production boundary within households (1993 SNA: 6.23-6.33) was subject to considerable debate during the revision of the SNA.¹ The 1993 SNA acknowledges that certain kinds of household activities may be particularly important in some developing countries and that this issue deserves careful consideration.² However, as in the 1968 SNA, with the exception of housing services no values for the production of services by households for own final consumption are to be recorded in the central framework of the 1993 SNA.³ This choice was justified on the following grounds:

- “limited repercussions on the rest of the economy;

1. For instance, one of the problems raised was that the SNA definition of production implies a gender bias since women typically spend more time than men in providing services to others within their immediate family and hence a smaller fraction of their contributions to society as a whole is valued within the system.

2. Expansion of the scope of the production boundary by the 1993 SNA removes some of the limitations of the 1968 version, which excluded the production of goods not made from primary products, the processing of primary products by those who do not produce them and the production of other goods by households who do not sell any part of them on the market.

- difficulty in the imputation of monetary values;
- adverse effects on the usefulness of the accounts for macroeconomic analysis and policy purposes.”

2.14. Services produced within households for own consumption were considered to have limited repercussions on the rest of the economy because of the self-contained nature of these activities. In contrast to the production of goods for own consumption – which can be sold or supplied to another unit at any point in time – the production of services for own consumption implies of necessity a simultaneous consumption of these services within the household.

2.15. The difficulty in the imputation of monetary values arises because most household domestic and personal services are not produced for the market so that there are usually no suitable market prices available to value them. In addition to this valuation problem, it can be observed that imputed values have in any case a different economic significance from the other monetary values. The 1993 SNA (Para 6.21) notes, for instance, that “if a household member were offered the choice between producing services for own consumption and producing the same services in return for remuneration in cash, the paid employment would likely be preferred because of the greater range of consumption possibilities it affords. Thus imputing values for own account production of services ... would yield values which would not be equivalent to monetary values for analytic or policy purposes”.

2.16. As regards the usefulness of the accounts it is pertinent to note that the SNA production boundary is not only relevant for the variables explicitly recorded in the accounts, but also to related variables such as labour force and employment. The definition of the *economically active population*, as provided by the Thirteenth International Conference of Labour Statisticians (International Labour Organization, 1982), refers in fact to “all persons of either sex who furnish the supply of labour for the production of economic goods and services as defined by the United Nations System of National Accounts”. This definition would become meaningless if the production boundary were to include own-account household services because this would imply most of the population was in the labour force – the distinction between employed and unemployed would be blurred, and unemployment would be virtually eliminated by definition.

2.17. The 1993 SNA acknowledges that in most countries the own-account production of services within households undoubtedly absorbs a considerable amount of labour and their consumption contributes much to welfare. The delineation of the production boundary is explained as the result of a deliberate compromise between the desire to be as comprehensive as possible and the need not to impair the usefulness of the System for analytical and policy-making purposes in accordance with the needs of most users. Like its predecessors, however, the 1993 SNA is only a stage in the development of national accounting. Generally speaking, the debate on the scope of the production boundary is far from being over.

2.3. Transactions and Other Flows

2.18. Output, final uses, and incomes are all concepts known as *transactions*. As previously mentioned, what are included as transactions is largely decided by the 1993 SNA production boundary. However, there are other events that affect the economy through changes in stocks. The 1993 SNA refers to these events as *other flows*. Other flows do not constitute output or uses as such, and care must be taken to ensure that measurement of transactions properly excludes any such flows. Particular examples of other flows are *holding gains and losses*, which should be excluded from output and related transactions.

2.19. Most transactions in the national accounts have a money value, are between different parties, and have a *quid pro quo* (something for something) character. However, the 1993 SNA also acknowledges transactions that have no money value as such, for example barter transactions, and output for own consumption. In these cases a money value is imputed, ideally, a comparable market price. In addition, the 1993 SNA recognises some transactions that are not between different parties (for example consumption of fixed capital and output for own consumption) or that do not have a *quid pro quo* (for

3. However, in Chapter XXI Satellite Analysis and Accounts, the 1993 SNA suggests including estimates of household production of services for own use in satellite accounts where an alternative concept of gross domestic product could be elaborated using an extended concept of the production boundary.

example taxes). However most transactions have two economic actors, whether from the same or different sectors and can thus be measured from two sides. In this sense there are two chances of measuring them, which has great significance in the compilation of the national accounts when data from many sources are brought together.

2.20. The 1993 SNA distinguishes two main groups of transactions, namely, current transactions and accumulation transactions. Current transactions can be divided into productive transactions (transactions that concern the production process) and distributive transactions (transactions that concern the distribution, redistribution and use of income created in the production process). The distinction between productive and distributive transactions is of particular importance in defining the concept of illegal production (see Chapter 3). Accumulation transactions are relevant for the processes of capital formation and finance.

2.21. Concerning the other flows that are not transactions and do not in any way relate to production, but, nevertheless, may have an effect on the economy, the 1993 SNA distinguishes two types:

- *other volume changes* – volume changes in stocks that are not caused by production such as new discoveries of subsoil minerals and oil deposits and destruction of stocks through catastrophic losses, *e.g.* due to floods or earthquakes;
- *changes in price* – can cause the value of stocks to increase or decrease. While this does not affect current transactions it does affect the economy through the changes in the value of the stocks.

The System does not record these other flows in the transaction accounts, but in the *other changes in assets* accounts.

2.4. Units and Classifications of Units

2.4.1. Institutional Units, Sectors and Subsectors

2.22. The concept of *institutional unit* is the starting point for consideration of the units engaged in economic activities. An institutional unit is defined as “an economic entity that is capable, in its own right, of owning assets, incurring liabilities and engaging in economic activities and in transactions with other entities” (1993 SNA: 4.2). “There are two main types of units in the real world that may qualify as institutional units, namely persons or groups of persons in the form of households, and legal or social entities whose existence is recognised by law or society independently of the persons, or other entities, that may own or control them” (1993 SNA: 4.3).

2.23. The 1993 SNA concept of *household* is complex, not only because households can be very heterogeneous economically and socially, but also because their behaviour from an economic point of view may be more varied than that of the other institutional units. In fact, they may engage in any kind of economic activity and they may assume the role of final consumers as well as producers. Production within the household sector takes place within enterprises directly owned and controlled by members of households (individually or in partnership with others).

2.24. In their capacities as economic production units, institutional units are referred to as *enterprises* (1993 SNA: 5.1). It should be noted that the 1993 SNA definition of enterprise is very broad. It not only includes all “businesses”, as known in common parlance, but also includes government enterprises, non-profit enterprises, small market producers, and even those that do not market any of their production. These small producers can be a significant source of non-observed activities.

2.25. A widely used definition of enterprise is contained in a European Union document – Section III of the Annex to the Council Regulation (EEC) No. 696/93 of March 1993 on the statistical units for the observation and analysis of the production system in the Community. This is directly linked to the descriptions given in the introduction to the UN International Standard Industrial Classification (ISIC, Rev.3) and the 1993 SNA: “The enterprise is the smallest combination of legal units that is an organisational unit producing goods and services, which benefits from a certain degree of autonomy in decision-making, especially for the allocation of its current resources. An enterprise carries out one or more activities at one or more locations. An enterprise may be a sole legal unit.” An enterprise can be

one of three types depending upon the underlying institutional unit and its activities: *corporation* (including *quasi-corporation*), *non-profit institution* or *unincorporated enterprise*.

- A *corporation* (1993 SNA: 4.23) is “a legal entity created for the purpose of producing goods or services for the market, that may be a source of profit or gain to its owner(s); it is collectively owned by the shareholders who have the authority to appoint directors responsible for its general management”. “The laws governing the creation, management and operations of corporations may vary from country to country” (1993 SNA: 4.24), but the essential features of a corporation are its creation by law, its accountability for its own actions, its ownership and control by shareholders, and its purpose to produce goods and services at economically significant prices.
- A *quasi-corporation* (1993 SNA: 4.49-53) is an unincorporated enterprise that operates as if it were a corporation and, thus, must be treated as if it is one. All unincorporated enterprises owned by non-residents are defined as quasi-corporations. Quasi-corporations may also be owned by general government institutional units or by households. Since quasi-corporations owned by households may be more difficult to identify, it is worth noting that one important element of the definition is the presence of a complete set of accounts.
- *Non-profit institutions* (1993 SNA: 4.54) are “legal or social entities created for the purpose of producing goods and services whose status does not permit them to be a source of income, profit or other financial gain for the units that establish, control or finance them”.
- All other enterprises are *unincorporated enterprises*. An *unincorporated enterprise* refers to an institutional unit (a household or government unit) in its role as a producer and “it covers only those activities of the unit that are directed towards the production of goods or services”, whereas corporate enterprises and non-profit institutions are complete institutional units (1993 SNA: 5.1).

2.26. As noted previously, some government unincorporated enterprises are treated as quasi-corporations (1993 SNA: 4.109). However, most government unincorporated enterprises are largely or entirely non-market producers, meaning that they provide output free or at prices that are not economically significant to the general public or other government units.

2.27. The remaining unincorporated enterprises are owned and operated by households. They are referred to as “household unincorporated enterprises”. The term “unincorporated” here simply emphasises the fact that the producer unit is not a separate legal entity distinct from the household itself.

2.28. Many households do not contain an unincorporated enterprise. Some households may share an unincorporated enterprise in a partnership. Household enterprises are divided into two groups: *unincorporated market enterprises* primarily producing goods or services for sale or barter; and *unincorporated non-market enterprises* producing primarily for their own final use (1993 SNA: 4.144 and 4.147).

2.29. For the purposes of data collection, the most important division of enterprises is into those that are household unincorporated enterprises and those that are not. Thus, for convenience in this Handbook, although this is not standard terminology, enterprises that are corporations, quasi-corporations, non-profit organisations, or government unincorporated enterprises may be collectively referred to as *non-household enterprises* and household unincorporated enterprises referred to simply as *household enterprises*.

2.30. Institutional units are grouped (1993 SNA: 4.6) into five mutually exclusive, exhaustive *institutional sectors*. Households constitute the *household sector*, and the other institutional units are divided into four sectors, namely: *non-financial corporations*, *financial corporations*, *general government*, and *non-profit institutions serving households* (NPISH).

2.31. The underlying criterion for the grouping of units to sectors is the homogeneity of the units as regards their objectives, functions and behaviour. In turn, sectors can be divided into sub-sectors depending “upon the analysis to be undertaken, the needs of policy makers, the availability of data and the economic circumstances and institutional arrangements within a country. No single method of sub-sectoring may be optimal for all purposes or all countries” (1993 SNA: 4.12). Thus, alternative methods of sub-sectoring are proposed by the 1993 SNA for certain sectors. In relation to the household sector it is noted that “it is

particularly important for many developing countries to be able to distinguish between the formal and informal sectors of the economy" (1993 SNA: 4.159). This is further discussed in Section 3.2.3.

2.4.2. Kind of Activity Units, Local Units and Establishments

2.32. The 1993 SNA and ISIC, Rev 3 recognise that an enterprise, particularly a large enterprise, may be engaged in a range of different activities at various different locations. In such a case, the classification of a large enterprise to a single activity, at a single location, results in a loss of detail – detail that would be useful for analytical purposes. This leads to the idea that large enterprises should be divided into smaller, more homogeneous *producing units* that can be more precisely classified and that collectively represent the enterprise as a whole.

2.33. Partitioning an enterprise by reference to its various activities results in one or more *kind of activity units*. Partitioning an enterprise by reference to its various locations results in one or more *local units*. Using both methods of partitioning simultaneously results in one or more *establishments*. More specifically an establishment is defined (1993 SNA: 5.21-27) as an enterprise or part of an enterprise at a single location, engaged in essentially a single activity, and capable, in principle, of providing the data required for the production and generation of income accounts. The 1995 European System of Accounts (ESA 1995), produced by Eurostat (1995), defines a *local kind of activity unit* in place of an establishment, but the terms are synonymous.

2.34. Kind-of-activity units and establishments are grouped according to their primary economic activity using an activity classification. To enable cross-country comparisons, it is essential to use an international standard. The standard specified is ISIC, Rev 3 (1993 SNA: 5.3 and 5.5). It is used to classify each enterprise, or part of the enterprise, according to its *primary activity*, defined as the activity that generates the most value added (1993 SNA: 5.7).

2.5. Economic Territory and Residence

2.35. Households and enterprises often engage in economic activities abroad, and foreign units often develop activities within the country. For instance, an enterprise may transport goods from the country across the border, or between two foreign countries. The 1993 SNA provides the criteria to decide which units belong to the national economy.

2.36. The *economic territory* of a country (1993 SNA: 14.9-14.11) consists of the geographic territory administered by a government within which persons, goods and capital circulate freely. It includes islands, air space and territorial waters, also territorial enclaves in other parts of the world that the government owns or rents for diplomatic, military or scientific purposes. It excludes territorial enclaves within its geographic boundaries that are used by foreign governments or international organisations.

2.37. The core of the residency principle is that, to belong to a national economy, an institutional unit should have a *centre of economic interest* within the economic territory (1993 SNA: 14.12). A centre of economic interest is deemed to be present when there exists a location – a place of work – within the economic territory of the country where the institutional unit engages or intends to engage in economic activities on a significant scale over an indefinite or long period of time. Long period is usually defined as the presence of the unit in the territory for at least a year (1993 SNA: 14.13).

2.38. Output of a resident unit is included in the GDP of the country of residence no matter where that output is realised. Thus, for example, if an enterprise provides transport services between two foreign countries, this output is part of the output of the country of residence of the enterprise.

2.6. Current Price and Volume Measures

2.39. While the distinction between current price measures and volume measures does not affect the concepts and definitions as such, price and volume measurement pose their own problems, which should not be ignored in the context of the NOE. For many uses of the national accounts, volume measures are as least as important as current price measures. For instance, the growth rate of GDP, which is one of the main economic indicators, is usually presented in volume terms.

2.40. In national accounts terminology, *volume measures* can be defined as current price measures from which the effects of price changes have been removed. Volume measures can have the format of constant price data (data of one year expressed in the prices of a reference year), indices (constant price data of one year divided by the constant price data of the base year), or growth rates (constant price data of one year divided by the constant price data of a previous year).

2.41. In measuring the NOE, it is important to consider the price and volume components. It is tempting to assume that prices of transactions in the NOE behave in the same way as in the regular part of the national accounts, and thus, that the same deflators may be used. However, it is also worthwhile questioning this assumption. For instance, it is quite plausible that prices in the informal sector develop differently from those in the formal sector if the supply and demand curves are different. If this is the case, separate price indices would need to be developed to obtain accurate volume estimates or to obtain accurate current estimates if the constant price estimates have been obtained by extrapolating base year values by volume indicators.

2.7. Labour Related Concepts

2.42. Labour related concepts included in the 1993 SNA are population, number of jobs, total hours worked, full-time equivalent employment, and compensation of employees. The 1993 SNA refers to a Thirteenth International Conference of Labour Statisticians Resolution for definitions of the numbers of persons that are *employed*, *unemployed* and *not in the labour force* (International Labour Organization, 1982). Given their central role within the 1993 SNA, it is vital that labour market data are based on consistent, coherent measurements, integrated within the 1993 SNA framework. The relevant labour market concepts are summarised in Figure 2.1, which is copied from the 1993 SNA.

2.43. The *population* of a country is the annual average number of persons (including foreigners) present in the economic territory of the country who reside or intend to remain within the economic territory for a period of time not shorter than one year. Persons who are living abroad for a period not exceeding one year are considered to be part of the population although temporarily absent.

2.44. The total population of a country therefore includes:

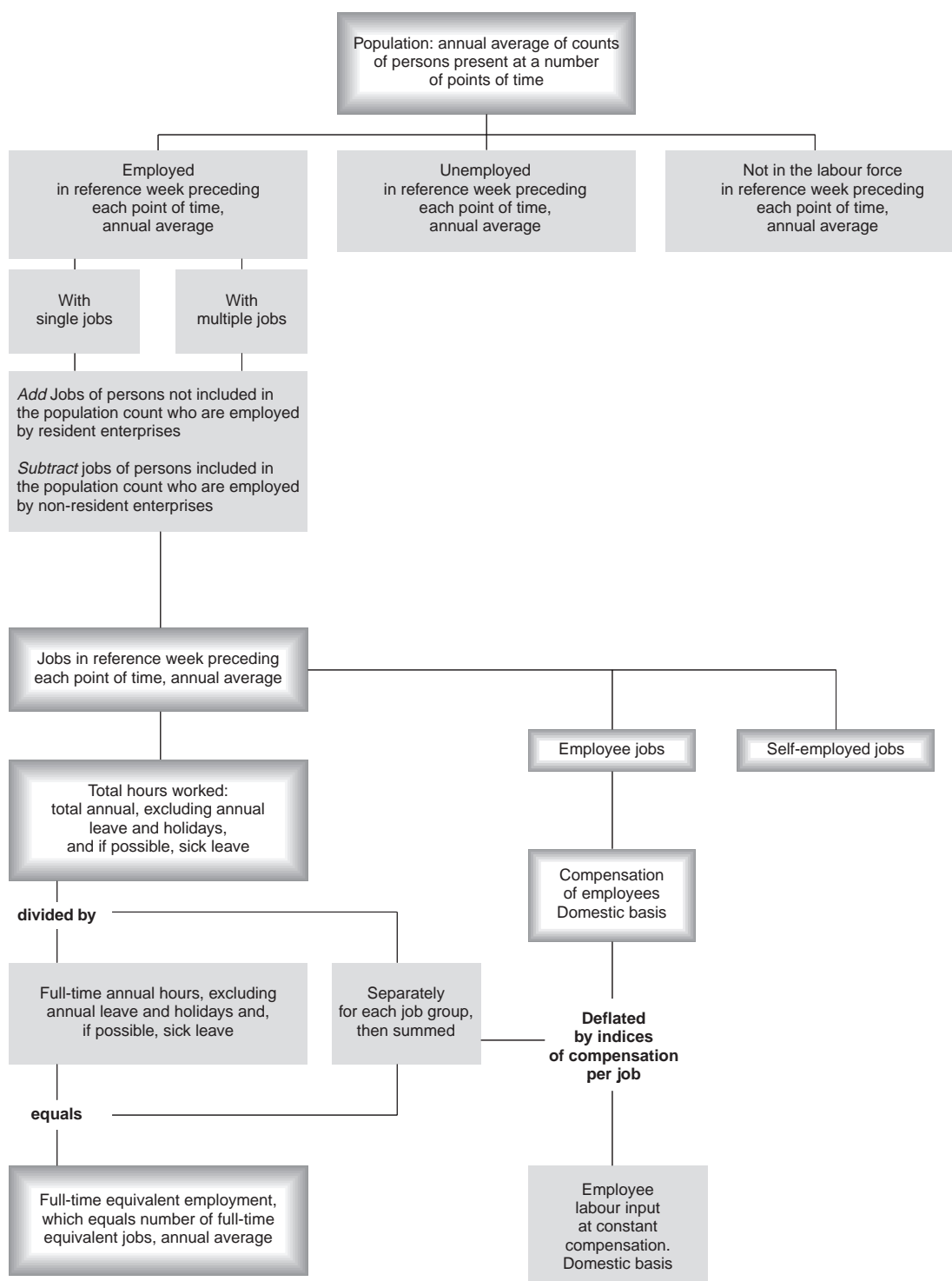
- nationals present within the territory;
- nationals living abroad for a period not exceeding one year (*e.g.* seasonal workers and cross-border workers);
- foreigners (with the exception of military personnel, members of diplomatic corps and students) residing for a period exceeding one year;
- students abroad (regardless of length of stay);
- members of the Armed Forces stationed in the rest of the world;
- members of diplomatic corps stationed abroad;
- national crewmembers stationed on ships, aircraft or oilrigs located outside the economic territory.

2.45. As previously noted, the residence of the household, as a unit, is determined according to the location of its principal centre of economic interest. This is defined as the location of one or more lodgings considered by the family as their principal residence, regardless of where the individual family members work.

2.46. Using the concept of *labour input*, *i.e.*, the total amount of work performed in a productive system, analyses can be made of the performance and characteristics of the economic system and of different economic activities and/or different territorial areas.

2.47. The population is broken down into *employed persons*, *unemployed persons*, and *persons not in the labour force*. The set of employed persons is then analysed according to the activities they perform, using the concept of job. A *job* is defined as an implicit or explicit contract between a person and an institutional unit. An employed person may have one or more jobs, running in parallel or at different times, within the reference period. Self-employed jobs are also included. In this case there is considered to be an

Figure 2.1. (1993 SNA Figure 17.1) Population and labour concepts



Note: Those concepts which are part of the SNA are in heavy boxes.

implicit contract between the self-employed persons in their capacity as owners of unincorporated enterprises and themselves as employees.

2.48. Estimates regarding population and labour input are calculated as average values for the reference period. Persons who are not involved in production processes, even though under formal contract with the enterprise, are not counted as having jobs.

2.49. The preferred measure of labour input for the 1993 SNA is the *total hours worked*. This excludes the time spent on annual leave, holidays, and if possible sick leave. Hours worked can be characterised as: *hours paid – hours paid but not worked + hours worked but not paid*.

2.50. While hours worked is the best instrument for measuring labour input, there may be technical difficulties inherent in its measurement. For this reason the 1993 SNA introduces the concept of *full-time equivalent employment*, which is calculated by dividing the total number of hours worked by average full-time annual hours for each job group and summing over all job groups. The 1993 SNA gives no indication as to the exact methodology for making the estimate. It simply points out that the most appropriate procedure is to determine the average annual number of hours worked as per contract, and to use this information to convert from jobs to full-time equivalents. It also points out that this calculation should be computed separately for each branch of economic activity and/or for each job type.

2.51. *Labour input at constant compensation* is determined by measuring employee labour input on the basis of job compensation for the base period. This is useful for focusing on the variations in the different job categories and the different branches of economic activity.

2.52. The concepts defined thus far form the necessary and sufficient groundwork for measuring labour input. However, for a more finely tuned description, the 1993 SNA makes a distinction between employee jobs and self-employment jobs. *Employee jobs* include individuals working under an employment contract for resident institutional units and receiving compensation in return. *Self-employment jobs* refer to single proprietors or co-proprietors of unincorporated enterprises as well as contributing family workers. All persons working for a corporation or a quasi-corporation are considered employees. This means that the owner of an incorporated enterprise or quasi-corporation is counted as an employee when he or she works for that enterprise.

2.53. Population, jobs (divided into employee jobs and self-employment jobs), total number of hours worked, full-time equivalent employment, and compensation of employees are the concepts that are an integral part of the 1993 SNA. Number of employed persons and labour input at constant compensation are viewed as auxiliary variables.

2.54. The labour input within an economic territory is determined by the jobs within that territory, which are in turn determined by the residence of the employing or self-employed institutional unit. Consequently this does not include labour input associated with jobs belonging to non-resident units, for example workers who live in one country but work in another. Thus full-time equivalent employment cannot be compared with population. The compensation of a person who lives in country A but works in country B is part of the value added of country B although it is part of the national income of country A.

2.8. The Production Approach

2.8.1. Introduction

2.55. In the production approach, GDP is measured as the sum of value added by industries, augmented with *net taxes and subsidies* on products. *Value added* is the difference between *total output* and *intermediate consumption* (the goods and services used in the production process), and can be measured *gross* (before deducting consumption of fixed capital), or *net* (after deducting consumption of fixed capital).

2.56. It is not self-evident what goods and services should be considered as output, nor what goods and services can be considered intermediate consumption. As noted earlier, it has been argued that many household activities (such as cooking and cleaning) and do-it-yourself activities (such as car maintenance) are productive, and should be included in output as measured in the national accounts. Likewise, it has been argued that the use of the environment should be recorded as intermediate

consumption. As explained above, the 1993 SNA contains a very important concept, namely, the production boundary in order to decide on these issues for the purpose of GDP measurement. Although the production boundary provides a general rule, quite a few issues remain that do not immediately follow from this rule. Subsection 2.8.2 discusses the most relevant aspects from the 1993 SNA in this respect. Besides deciding what should be included in the accounts as output and intermediate consumption, it has also to be decided how these should be recorded: at what value and at what time. As well, it has to be decided how the national accounts of any particular country can be delineated *vis-à-vis* the rest of the world. The 1993 SNA rules in these respects are discussed in subsequent subsections.

2.8.2. Output

2.57. Concerning output, specific issues that need to be highlighted concern the distinction between market and non-market output and the measurement of these types of output. Market output is output sold at an agreed price that, in principle, covers costs and a margin for operating surplus/mixed income. Such output can be paid for in whatever currency units partners to the sale/purchase agree upon, or be exchanged for other goods and services, which is dubbed barter trade.

2.58. A specific case of barter is when a producing unit provides part of its output to its employees as wages in kind. Common examples of such output include free meals in restaurants, free health care services produced by the employer (or an establishment in the same enterprise), and use of holiday facilities operated by the employer (the latter two examples are particularly relevant in formerly centrally planned economies). Such output should be included in the output of the units themselves, or of specific establishments, depending on the arrangements that are in place.

2.59. Another special case of output concerns banking services. These services are usually only partly paid for through fees, although in some countries these may be quite substantial. In any case, the 1993 SNA requires full inclusion of banking services in output, including the part that is not paid for directly. This output is dubbed *financial intermediation services indirectly measured* (FISIM) and is defined as the difference between the interest received by banks and the interest paid by them.

2.60. Non-market output concerns output that is intended for own final use by the producer, or to be provided to users at *economically non-significant prices*, defined as prices that do not significantly affect supply and demand. Output intended for own use can be production of goods for household consumption, for fixed capital formation and work-in-progress. An important example of own account production of goods for households is agricultural production of foodstuffs to be consumed within the producing households. Another important example concerns production of owner-occupied housing services. Where households own the dwelling they live in, the System treats this as a production of housing services consumed within the same household.

2.61. Important examples of own account fixed capital formation are computer software developed within an enterprise, and construction of dwellings for own occupation and sheds for agricultural purposes. In particular, in developing countries farmers often construct sheds near distant plots for shelter and for storage. Other examples of fixed capital formation on own account include raising cattle for reproductive purposes, and growing fruit trees.

2.62. Work-in-progress can be seen as output for own use in the sense that it is intended for further processing before a finished product can be marketed. One can argue about the “own use” character of such output (see Bloem *et al.*, 2001), but the main issue is that, for production processes that take longer than a single accounting period, output should be recorded in the period in which it takes place rather than at the time a finished product is realised. Examples of activities in which work-in-progress is relevant are construction, production of machinery, agriculture (*e.g.* crops in the field, sheep for wool), producing movies and organising major events.

2.63. Non-market output is mostly generated by government and NPISH. Non-market services can be for individual consumption or for consumption by society at large. It should be noted that, in cases where a government or an NPISH buys products from other producers to provide free to other units, this

does not affect the output of government or the NPISH themselves (except for the activities involved in distributing such products).

2.64. The gross output of enterprises/establishments is usually not the same as the value of sales. For goods-producing enterprises some of the goods sold are taken from inventories produced or purchased for resale in earlier periods. Similarly, some of the goods produced or purchased in the current period will enter inventories for sale in later periods. Inventories include work-in-progress. Goods produced or purchased may also be used for own consumption by the enterprise owner's household, or given to employees as wages in kind, rather than being sold. In developing countries such uses of goods tend to be more important than changes in inventories in generating a difference between gross output and value of sales.

2.8.3. Intermediate Consumption

2.65. In concept, intermediate consumption is a measure of the goods and services used up in a period in the production process. In practice, businesses do not directly measure their intermediate usage of goods and services; rather they record their purchases and the changes in inventories of fuels and materials. Therefore, it is necessary to estimate intermediate consumption as:

- expenditure on purchases of materials and supplies, and services used as inputs;
- less changes in inventories of materials and supplies (inventories include work-in-progress).

2.66. Specific issues to be considered in regard to intermediate consumption concern the borderline between intermediate consumption and compensation of employees, and the borderline between intermediate consumption and fixed capital formation. As with output, intermediate consumption can involve barter trade, and deliveries between establishments of the same enterprise.

2.67. Concerning the borderline between intermediate consumption and compensation of employees the main issue is whether the goods and services provided to employees are for their own use, or for use in the production process. An example of a borderline case is clothing provided to employees with a use that is not limited to the production environment but have possible off duty use (military uniforms are an example).

2.68. Regarding the borderline between intermediate consumption and fixed capital formation, the main issue is whether a product is entirely used up in a single accounting period or whether it can be used for a number of periods. As a practical convention, the 1993 SNA has adopted the rule that a product that is used for more than one year is to be considered as fixed capital, and if it is used for less than one year as intermediate consumption. If such a product is considered intermediate consumption, its whole value is to be deducted from output to derive gross value added. If a product is considered fixed capital, its use will not affect gross value added but net value added will be lower by the amount of consumption of fixed capital during the period of its use.

2.8.4. Valuation and Time of Recording

2.69. Both concerning valuation and time of recording, perspectives often differ between participants in a sale/purchase agreement, and the 1993 SNA has to offer solutions that allow consistency. In the 1993 SNA, valuation of output and intermediate consumption is basically at market prices, that is, at prices upon which willing buyers and sellers agree. Often, such prices are not available for all output (*e.g.* work-in-progress) and in such cases the 1993 SNA offers as alternatives to use prices from comparable products, or cost plus mark up.

2.70. As a general rule, non-market output of government and NPISH is valued at cost. These costs include wages and salaries, intermediate consumption and consumption of fixed capital. Government's intermediate consumption includes weapons, tanks, warships, missiles, etc. purchased by the armed forces, but excludes items such as transport vehicles, hospital equipment, computers, etc., which are treated as capital formation. Government's intermediate consumption does not include goods and services purchased in order to be provided free to other units. This is also the case for NPISH. As a general rule, according to the 1993 SNA, no

taxes on products are recorded for government units and NPISH. However, such units *can* pay taxes on production (such as real estate taxes) and these should be included in output.

2.71. Market prices differ between producers and users. For producers the most relevant price is the basic price, that is the price they receive before net taxes and subsidies on products and trade and transport margins have been included. This is also the preferred valuation for output in the 1993 SNA. Because it is sometimes difficult to measure output in basic prices, the 1993 SNA also allows the use of producer prices, which are basic prices plus net taxes and subsidies on products (exclusive of deductible value added taxes). For users the most relevant price is the purchasers price, which includes all taxes less subsidies on production and trade and transport margins. This is also the recommended valuation in the 1993 SNA for intermediate consumption.

2.72. Total GDP also includes net taxes and subsidies on production and imports. For the production approach this means that if output has been valued at basic prices, total value added of industries has to be augmented with net taxes and subsidies on products to arrive at a GDP estimate.

2.73. Concerning time of recording, the 1993 SNA considers two basic options namely *cash basis* and *accrual basis*. In general terms, *cash basis* is when the actual payment is made and *accrual basis* is when change of ownership takes place. The 1993 SNA requires recording on an accrual basis.

2.9. The Expenditure Approach

2.9.1. Introduction

2.74. In the expenditure approach, GDP is estimated by adding up all final uses of resident units. The 1993 SNA distinguishes seven types of final uses:

- household final consumption;
- government final consumption;
- final consumption by NPISH;
- gross fixed capital formation;
- changes in inventories;
- acquisition less disposal of valuables;
- net exports of goods and services, *i.e.*, exports less imports.

2.75. What is included in these types of final uses is explained in subsequent subsections. Some important preliminary remarks concern the types of final expenditure in which the various institutional sectors engage, the different ways to look at consumption, and the time of recording and valuation.

2.76. As regards final consumption it should be noted that not all institutional units engage in all types of final uses. In fact the only type of final use that all resident sectors engage in is acquisition less disposal of valuables. Evidently, households are the only units that engage in household final consumption and, because they also may have productive activities, they may also have fixed capital formation and changes in inventories. By convention government is deemed to consume its own output (to the extent that it is not sold), which is called government consumption. Furthermore, besides acquisition less disposal of valuables, government has fixed capital formation and changes in inventories. NPISH engage in the same type of expenditures, except that they are deemed to consume output of NPISH. The corporate sectors have, besides acquisition less disposal of valuables, fixed capital formation and changes in inventories as final expenditures. For the rest of the world sector only imports by resident units and exports from resident units are recorded.

2.77. In the context of national accounts, consumption can be viewed from two perspectives, namely, the *expenditure* perspective and the actual *consumption* perspective. The expenditure perspective is at the core of the 1993 SNA. What is relevant from this perspective is who actually paid for the consumption, either by making an actual monetary payment, by barter, by incurring a liability, or by producing the product on own account. As well, some specific transfers in kind are deemed by the System to be transfers

in cash so that the recipient is deemed to have paid for the products involved. For example, this is the case with international relief goods and current transfers in kind that are not from government or NPISH.

2.78. The 1993 SNA also includes the concept of *actual consumption*, which – for households – includes not only expenditures, but also social transfers in kind. Social transfers in kind are individual goods and services produced or purchased by government and NPISH that are provided free to households. In the same vein, actual consumption for government and NPISH excludes these goods and services. Examples of individual consumption goods and services are health care, education, and cultural services and, by convention, all services provided by NPISHs.

2.79. As mentioned in relation to the production approach, expenditures are to be recorded on an accrual basis and to be valued at purchasers prices.

2.9.2. Household Final Consumption Expenditure

2.80. Household final consumption expenditure consists of expenditure incurred by households on goods and services. Most of these are goods bought in shops and markets and services like dry cleaning, shoe repairs, hairdressing, restaurant meals, etc. Also included are:

- goods produced by households for own consumption;
- purchases or barter from other households;
- expenditures on financial intermediation services indirectly measured (FISIM);
- services of insurance companies and pension funds;
- compensation of employees paid as income in kind;
- imputed rent of owner-occupied dwellings.

2.81. Because households include households with unincorporated enterprises, care should be taken not to include expenditure for intermediate consumption and fixed capital formation of such enterprises in household consumption.

2.82. Licenses and fees have to be included in household consumption expenditures if a good or service is provided in return. Examples are tuition fees and fees for medical care. An important criterion is whether the payment is commensurate with the return. For instance, if the fee for a passport is commensurate with the costs of producing it, the payment for it can be classified as household consumption expenditure. If the fee is much higher, it is classified as a current tax.

2.83. The residency principle is also applicable to household consumption expenditures. In this case, this principle means that the expenditures of resident households made abroad should be included, but that expenditures by residents of other countries should be excluded.

2.9.3. Government Final Consumption Expenditure

2.84. Government final consumption expenditure comprises all non-market gross output (excluding capital goods) of government units and non-profit institutions financed by government, minus sales of goods and services to other units. Goods and services purchased by government to pass on free to the population should also be included. As mentioned in Section 2.8.2, government non-market output and non-market output of NPISH are estimated as the sum of costs, and intermediate consumption of government includes weapons and similar equipment for the armed forces.

2.9.4. Final Consumption Expenditure of NPISHs

2.85. Except for the issue of military goods the description of government final consumption expenditure in Subsection 2.9.3 also applies to final consumption expenditure of NPISHs.

2.9.5. Gross Fixed Capital Formation

2.86. Gross fixed capital formation (GFCF) consists of goods that are used in a production process for more than one year. GFCF is measured by the value of expenditure on tangible and intangible fixed

assets to be used in production. The assets concerned can be purchased or produced on own account. Gross fixed capital formation is equivalent to the acquisition, less disposals, of new and existing fixed assets (tangible or intangible) plus the improvement and cost of ownership transfer associated with fixed assets and with all non-produced assets such as land and sub-soil assets.

2.87. Tangible fixed assets include:

- dwellings and other structures such as factories;
- civil engineering works;
- machinery and vehicles;
- expenditure on fruit-bearing trees, shrubs and vines, that are producing for a number of years;
- major improvements to tangible non-produced assets (*e.g.* land);
- expenditure on, and production of, breeding and dairy livestock that continue to be used in production year after year.

2.88. Intangible fixed assets include:

- computer software and databases;
- expenditures on mineral exploration;
- artistic products used in production (*e.g.* movies, literary or artistic originals).

2.89. GFCF is to be valued at market prices, or, if these are not available, either at costs plus mark up, or as the present (*i.e.*, discounted) value of future earnings. GFCF should be recorded when change of ownership takes place or, in the case of own account fixed capital formation, at the time of initiation of use (before initiation of use own account output of a fixed capital asset is regarded as work-in-progress and recorded as changes in inventories). GFCF covers both newly produced assets and existing assets.

2.90. GFCF includes expenditure made on own-account construction of dwellings and major repairs by households. GFCF excludes the acquisition of military hardware that is included in the intermediate consumption of general government.

2.9.6. Changes in Inventories

2.91. Changes in inventories include:

- raw materials and other materials;
- work-in-progress;
- goods for resale;
- finished goods (that is, finished goods held by the original producer).

2.92. A major concern in the valuation of changes in inventories is to avoid including holding gains and losses. For that purpose additions to inventories have to be recorded at the prices prevailing at the time of their entry, and withdrawals from inventories at the prices prevailing at the time of withdrawal. These valuation principles apply both to products purchased from others and products produced within the unit. The prices to be used should, ideally, be market prices, or, if these are not available, prices of comparable products or costs plus mark-up. If prices are based on costs plus mark-up, care should be taken that these also need to be corrected for price changes.

2.9.7. Acquisition and Disposal of Valuables

2.93. Valuables are described in the 1993 SNA as assets that are acquired as stores of wealth, that are not used up in production, that do not deteriorate over time, and that are expected to at least retain their value. Examples are jewellery, works of art, antiques, and precious stones and metals. In some countries commercial banks acquire gold and other precious metals as financial assets. These are also included as valuables.

2.9.8. Exports and Imports

2.94. Exports are goods and services provided by residents to non-residents, and imports consist of goods and services provided by non-residents to residents. Imports and exports include:

- shuttle trade;
- parcel post;
- gifts to and from individuals abroad except by parcel post;
- consumption expenditures abroad;
- construction and installation of equipment abroad;
- exports and imports of military equipment;
- foreign aid;
- supply of fuel, food, water and other products to national ships and aircraft abroad, and to foreign vessels in the country;
- value of fishery products sold by resident units operating in international waters to non-residents;
- direct purchases of goods by embassies and international organisations;
- non-monetary gold, *i.e.*, gold purchases for industrial purposes or held as “valuables” by commercial banks;
- cross-border barter goods;
- exports/imports of oil and natural gas by pipeline;
- very large items such as ships and aircraft;
- very small but high value items such as gems.

2.10. The Income Approach

2.95. GDP can also be estimated as the total of incomes, *i.e.*, operating surplus, mixed income, compensation of employees and rents. The *income approach* is sometimes presented as a third method of obtaining GDP, the other two being the production approach and the expenditure approach. The income approach is independent of the other two methods in the sense that the estimates of the various kinds of income may come from sources that are different from those used for the other methods. As a consequence, GDP estimates from the income approach can be used as a check on estimates from the production and expenditure sides. Conceptually, however, the income approach is the same as the production approach. Recall that for the production approach, value added is obtained as the difference between output and intermediate consumption. But this value added is nothing other than an estimate of the incomes – compensation of employees, operating surplus, mixed income and rents – that are being generated in the various kinds of productive activities.

2.96. The production approach normally uses information from enterprise surveys on gross output and intermediate consumption. The income approach usually makes use of administrative sources for employee compensation and of company accounts and tax records for operating surplus and mixed income. In both the income and the production approaches, operating surplus and mixed income are derived in the same way as residuals by deducting intermediate consumption and employee compensation from gross output.