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EUROSTAT'S TABULAR FRAMEWORK
FOR MEASURING THE NON-OBSERVED ECONOMY

1.   This is an extract from a paper prepared by Eurostat in March 2005 entitled "Eurostat's Tabular Approach to Exhaustiveness: Guidelines". This paper presents guidelines on the (N1-N7) classification of non-exhaustiveness types. This section refers to Annex C of the Guidelines. The UNECE secretariat includes the Annex in its Survey on the Non-Observed Economy as it presents a detailed description of the non-exhaustiveness types and their classification.

INTRODUCTION

2.   At the core of comprehensive and systematic assessment of exhaustiveness is the division of all productive activities according to their potential for non-exhaustiveness. For ease of analysis and interpretation, the division is based on a standard set of non-exhaustiveness types. The types are labelled N1-N7.
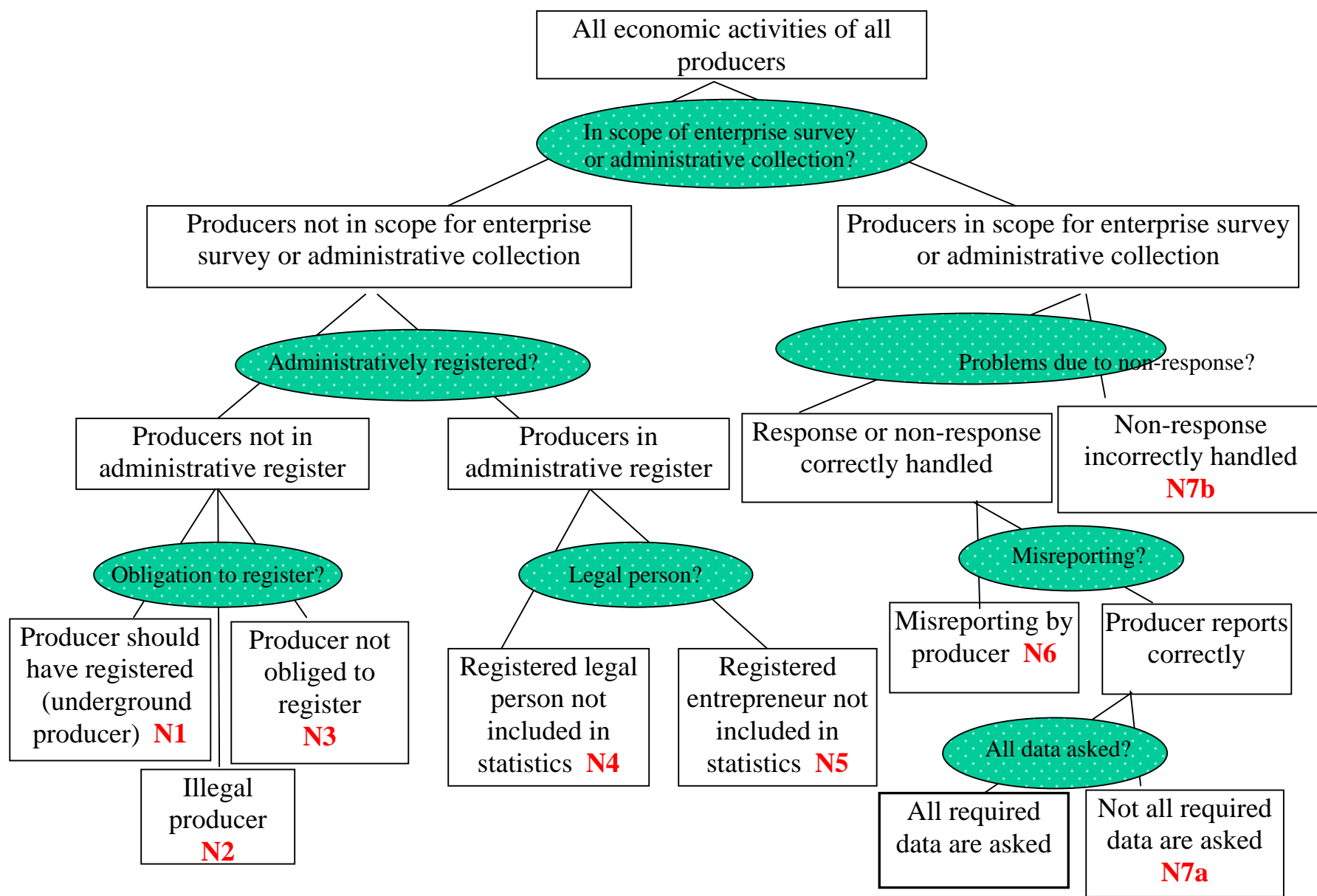
3.   The starting point is to look at non-exhaustiveness from the perspective of the compilation by the output approach for which most data are obtained from surveys or administrative collections of enterprises. In this context ***enterprises*** are referred to as ***producers*** to ensure that it is understood that all possible types of enterprise are involved, including non-market household enterprises.

4.   In order to ensure the types are mutually exclusive, the logic underlying their formulation is to divide productive activities according to their potential for being non-observed, using readily observable characteristics of producers, each characteristic being divided into a mutually exclusive, exhaustive set of categories. The characteristics used areas follows:
- Is the producer administratively registered or unregistered?
- Is the producer included in the statistical business register or not?
- What is the basic data source: a producer survey/administrative collection /another source?
- Is the producer a legal person/ entrepreneurship/ non-market household producer?
- Does the producer respond to surveys or not?
- Does the producer report correctly or misreport?
- Are all the data required for the national accounts collected or not?

5.   In combination, these characteristics underpin the definitions of types N1-N7 and provide a comprehensive breakdown of potential non-exhaustiveness. The derivation of types N1-N7 and their relationships are illustrated in Figure I overleaf.

FIGURE I

All economic activities of all producers

In scope of enterprise survey or administrative collection?

Producers not in scope for enterprise survey or administrative collection

Producers in scope for enterprise survey or administrative collection

Administratively registered?

Problems due to non-response?

Producers not in administrative register

Producers in administrative register

Response or non-response correctly handled

Non-response incorrectly handled **N7b**

Obligation to register?

Legal person?

Misreporting?

Producer should have registered (underground producer) **N1**

Producer not obliged to register **N3**

Registered legal person not included in statistics **N4**

Registered entrepreneur not included in statistics **N5**

Misreporting by producer **N6**

Producer reports correctly

Illegal producer **N2**

All data asked?

All required data are asked

Not all required data are asked **N7a**

6.   **Figure I** first considers whether or not a producer is subject to survey or administrative collection. A producer may not be subject to survey or administrative collection because:
*   it deliberately fails to register, because it is involved in underground (N1) or illegal (N2) activities; or
*   it does not need to register (non-market household producers) (N3); or
*   it is a legal person but not surveyed (N4); or
*   it is a registered entrepreneurship but not surveyed (N5).

7.   If the producer is subject to survey then the data obtained may not be exhaustive because:
*   the producer deliberately misreports (N6); or
*   the required data are not collected or properly processed (statistical deficiency) (N7).

8.   Types N1 to N7 are geared to the situation where data are obtained from surveys of producers. Thus their main application is in analysis of exhaustiveness in the context of GDP compilation by the production approach. They can also be applied to analysis by the income and expenditure approaches, but this more easily done if these data are obtained from producer surveys.

9.   The primary reason for defining a set of non-exhaustiveness types is as a diagnostic tool – the types facilitate the process of ensuring that every possible type of non-exhaustiveness is considered. In addition, they facilitate cross-country comparisons of adjustments and adjustment methods. Thus it is useful to associate types and adjustment methods, as is done in the following sections. However, some adjustments, in particular those arising from application of the labour input method, cannot always be uniquely associated with a single non-exhaustiveness type.

NON-EXHAUSTIVENESS TYPES: OUTPUT APPROACH

N1. Producers Deliberately Not Registering –Underground

*   *Producer deliberately fails to register as legal entity or as entrepreneurship in order to avoid tax and social security obligations*

10.   The non-exhaustiveness types are based on a division of producers into mutually exclusive groups. Thus, type N1 refers to the production of those producers that are not registered because they are involved in underground activities. Type N1 does not include all underground activities, some of which are associated with type N6.

11.   Typically type N1 involves small producers that have turnovers exceeding the thresholds above which they should register business income to the taxation authorities.

12.   Type N1 does not include producers that deliberately fail to register because they are involved in illegal activities (type N2).

13.   Identification and adjustment methods used for type N1
*   Labour input method.
*   Other supply-based methods, e.g. using household budget survey.
*   Demand-based methods.
*   Commodity flow methods.

N2. Producers Deliberately Not Registering – Illegal[1]

- *Producer deliberately fails to register as a legal entity or as entrepreneurship because it is involved in illegal activities*

14.   Producers engaged in illegal activities may avoid registration entirely, or they may register as legal entities or entrepreneurs and report their activities under different (legal) activity codes. N2 refers to the activities of those producers that avoid registration entirely. It excludes activities that are reported (including underreported) under legal activity codes. Thus N2 does not include all illegal production. Specifically, illegal activities may be undertaken by:

a)   producers that are unregistered because they perform illegal activities – type N2;
b)   producers that are not required to register, typically those producing goods and services for own consumption – type N3;
c)   producers that are registered and who do not report the activities – type N6; and
d)   producers that are registered and report the activities under the guise of legal activities - such activities do not contribute to any of the non-exhaustiveness types as they are reported and hence included in GDP estimates, even though they may be misclassified by industry.

15.   In short, the Tabular Approach to Exhaustiveness does not neatly classify all illegal activities within a single type. It splits them up into groups. This causes a problem if, as is typically the case, estimates of illegal activities are compiled not from surveys or administrative sources describing enterprises, but rather from estimates of the total production and/or consumption of a particular commodity, drugs, prostitution, etc. In this case the main challenge is to ensure that the resulting estimates are incorporated in GDP totals in a way that they do not duplicate activities that have already been included within the basic data from which the GDP estimates are compiled (see case d above) or within one of the other non-exhaustiveness estimates (cases b and c). The general approach suggested for each type of illegal activity treated separately, is the following:

- compile the estimate of all illegal activities of that particular type;
- compile an estimate of the illegal activities of that type that are likely to be have reported under the guise of legal activities;
- subtract the second estimate from the first and record the result under type N2.

16.   This may not be a conceptually pure approach, but it can be consistently done across all countries and it will result in complete estimates of GDP without double counting.

17.   The approach is best illustrated by an example:
Example: Prostitution
Obtain an estimate of total productive activity involving prostitution based on data from police/ health authorities regarding numbers of prostitutes and clients and average payments for services.
Obtain an estimate of prostitution activities that are reported by registered enterprises as legal activities, e.g., in massage parlours, and hence already included in GDP estimates.
Deduct the second estimate from the first and record the result as type N2.

Identification and adjustment methods for type N2

18.   As already stated above, the fact that N2 does not include all illegal production must be taken into account in compiling appropriate adjustments. Typically, an estimate of illegal production is obtained by observing inputs and/or uses and using an average price by quantity approach, for example, the number of drug addicts multiplied by their average consumption. The

adjustment required for illegal production estimated in this way must be reduced by the production that is already included within the legal economy, being reported under different activity codes.

N3. Producers Not Required to Register

- *Producer is not required to register because it has no market output;*
- *Producer has market output but on such a small scale that it is below the level at which it is expected to register as an entrepreneur*

19.   Non-market household producers may be involved in:

- production of goods for own final consumption and for own fixed capital formation;
- construction of dwellings, extensions to dwellings, and capital repairs of dwellings.

20.   N3 also includes unincorporated household enterprises that have very small-scale market output.

21.   Production associated with paid domestic services should also be included in N3 when data for them are not included in the basic statistics available to the national accounts.

22.   In the case of agricultural production where total output is obtained using commodity by price methods, there is no need to include an N3 adjustment for the agricultural output of households if such output is already included in the total. The separation of economic accounts for agriculture from the rest of the economy is quite common practice. On the other hand, non-agricultural productive activities of households should be included, together with productive activities of other households, including secondary activities, in types N3 or N7, as appropriate:

- in N3 for household producers that are not registered;
- in N7 for household producers that are registered and included within a producer survey or administrative collection, but for which data on secondary activities are not obtained. An example might be a registered farmer who, during the winter, is engaged in snow removal activities that were not subject to data collection.

23.   *Identification and adjustment methods used for type N3*
- Household income and expenditure surveys.
- Time use surveys.
- Building permits.
- Commodity flow methods.

N4. Legal Persons Not Surveyed

- *the legal person is of a type that is systematically excluded from the business register;*
- *the legal person should in principle be included in the business register but is not actually included;*
- *the legal person is in the business register but not subject to survey because classification data (activity code, size code, geographic code) are incorrect;*
- *a part of the legal person is not subject to survey because profiling data concerning producing units into which the legal person is divided (e.g., local units) are incorrect;*
- *the legal person is in the business register with correct classification and profiling data but excluded from the survey frame.*

24.   A producer can be a legal person and thus registered with an administrative source accessible by the statistical office and yet, for some reason, not included in the business register maintained by the statistical office. All such producers should be covered by means of a survey or administrative collection conducted without use of the register. Otherwise, adjustments should be made.

25.   A producer that is a legal person and in scope for the statistical register may not feature because:
*   it was too recently registered to be included; or
*   there was a deficiency in the register-updating procedures.

26.   The producer classification data may be incorrect because:
*   the classification data were incorrectly registered
*   changes in classification data have not been registered or otherwise detected;
*   the classification data have been too recently changed to be included; or
*   there is some other deficiency in the register recording or updating procedures.

27.   A legal person may be excluded from the survey frame because its size is below the threshold for the survey, or due to an error in the construction of the survey frame. The circumstances in which incorrect activity or size codes of producers result in systematic undercoverage is where the statistical office collects data from a suite of surveys, each of which covers a particular set of activities and/or sizes, and where data for any producers that have been misclassified in one survey are not transferred to the particular survey where they belong.

Identification and adjustment methods used for type N4

28.   Register data quality surveys and investigations, that is:
*   measurements of the birth rates of new producers and estimates of the time interval before producers are placed on the register;
*   measurement of register misclassification rates for activity and size codes;
*   comparison of the register population with other statistical and administrative sources.

29.   Adjustments based on other sources or expert estimates for producers excluded from surveys as a result of size thresholds.

N5. Registered Entrepreneurs Not Surveyed

*   the statistical office does not conduct a survey of registered entrepreneurs;
*   the registered entrepreneur is not in the list of registered entrepreneurs available to the statistical office;
*   the registered entrepreneur is in a list of registered entrepreneurs available to the statistical office but is systematically excluded from any survey of entrepreneurs;
*   the entrepreneur is in principle in scope for a survey of entrepreneurs but in practice is excluded from the survey frame because the classification data (activity code, size code, geographic code) are incorrect;

30.   An entrepreneur may be registered with an administrative source that is not accessible by the statistical office, or is accessible but, for some reason, not included in the statistical business register or other list of producers maintained by the statistical office.

31.   A list of registered entrepreneurs may be maintained by the statistical office as part of the business register or as a separate list. EU Regulations require all such producers to be in the business register. However, some countries may not successfully include all such units in their business register because such producers go in and out of business and change activity very fast and thus the administrative lists from which they can be obtained may often be out of date.

32.   Registered entrepreneurs may be covered by means of a producer survey or administrative collection conducted with or without use of the register. In so far as they are not covered, adjustments must be made.

33.   A registered entrepreneur may not be included in the business register because:
*   entrepreneurs of that particular type are systematically excluded:
*   the entrepreneur was too recently registered to be included; or
*   there was a deficiency in the register-updating procedures.

34.   The entrepreneur classification data may be incorrect because:
*   the classification data were incorrectly registered
*   changes in classification data have not been registered or otherwise detected;
*   the classification data have been too recently changed to be included;
*   other deficiency in register recording or updating procedures.

Identification and adjustment methods used for type N5

35.   Data quality surveys and investigations of registered entrepreneurs, that is:
*   measurements of the birth rates of new entrepreneurs and estimates of the time interval before entrepreneurs are placed on the list;
*   measurement of misclassification rates for activity and size codes;
*   comparison of the registered population with other statistical & administrative sources.

36.   Adjustments based on other sources or expert estimates for entrepreneurs excluded from surveys.

N6. Producers Deliberately Misreporting

*   *Gross output is under-reported and/or intermediate consumption is over-stated, in order to evade income tax, value added tax (VAT) or other taxes, or social security contributions.*

37.   For the countries that previously participated in the Tabular Approach to Exhaustiveness, adjustments for mis-reporting have by far been the largest. For example, for the 9 countries[2] that undertook calculations for the year 2000, adjustments for mis-reporting were the largest in 8 of the 9 countries – and, on average, accounted for virtually 50% of all exhaustiveness adjustments. Over the 9 countries, adjustments for mis-reporting added some 6% to GDP.

38.   Why is mis-reporting so important? The nature of mis-reporting is to understate gross output but overstate intermediate expenditure. While exhaustiveness adjustments for gross output are positive, those for intermediate consumption are negative so the relative impact on gross value added is much larger than the adjustments for other N-types[3].

39.   Mechanisms associated with mis-reporting include:
*   maintenance of two sets of books;
*   payments of envelope salaries, which are recorded as intermediate consumption;

- skimming;
- without bill settlements; and
- non-payment of VAT.

Identification and adjustment methods used for N6
- Comparison of wages & salaries per capita with norms by sector, public and private, industry and size groups.
- Comparison of intermediate consumption/gross output ratios with norms by sector, public and private, industry and size groups.
- Comparison of theoretical VAT with actual VAT for appropriate groups of producers.
- Comparison of theoretical income tax with actual tax for appropriate groups of producers.
- Use of tax audit data – from the fiscal authorities.
- Conducting and using the results of special surveys – providing the basis for norms.
- Expert judgement/ Delphi method, based on opinions of accountants, auditors, etc.

N7. Other Statistical Deficiencies

As a minimum, data sources and compilation methods in the following areas should be investigated for possible non-exhaustiveness:
- *handling of non-response;*
- *production for own final use by market producers;*
- *tips;*
- *wages and salaries in kind;*
- *secondary activities.*

40.   The treatment of these items in the basic data should be described. If they are appropriately handled in the basic data then no adjustments are required; otherwise adjustments are needed.

41.   There is a huge variety of other possible types of error in data collection and compilation (from poor questionnaire design through to the compilation methods themselves) that could result in non-exhaustiveness, but could equally easily result in the over-estimation of GDP. Examples are:
- valuation of exhaustiveness adjustments;
- estimates of taxes and subsidies on products;
- reliability of quantity-price methods and product balances.

42.   However, errors that do not systematically lead to non-exhaustiveness should be the subject of a general quality programme rather than being included here.

Handling of non-response

43.   In referring to non-response, the presumption is that data have been obtained by one or more surveys of producers or from administrative sources containing producer data. It is common practice for survey statisticians to make adjustments for non-response in the data that they publish and that serve as an input to the national accounts. Thus, whilst it is important to verify that such adjustments are made, the economic activities to which they correspond are not 'non-observed'. They are similar to activities of producers that are in the survey frame and covered by the survey weighting (grossing up) procedures, even though not in the sample survey. Thus, adjustments for non-response made by survey statisticians should not be included.

44.　The activities that should be covered here are those for which appropriate non-response adjustments have not been made by the survey statisticians and thus need to be made by national accountants. The most common example of this is when all producers that are non-respondents to the survey are assigned zero data values. This implies that the producers have no output. Another case where a non-response adjustment needs to be made in compiling the accounts is when there is reason to believe that non-respondents are significantly different from respondents and this has not been taken into account in producing the basic statistics.

45.　The more correct approach is to impute data for each such producer on a case by case basis, based on the actual or most probable reason for the non-response (e.g., refusal, out of business, cannot locate, etc). Imputation may be based on data for the previous year, data from similar units (industries, size groups), or industry by size group averages. Non-respondents about which there is no information can be accounted for by re-weighting the survey sample to reflect the probability that an appropriate proportion of them are active.

Production for own final use by market producers

46.　Special note should be taken of:
- production of agricultural or other products in the household sector for own final use (this concerns farmers and entrepreneurs);
- dwellings, extensions to dwellings, capital repairs of dwellings produced by households;
- own account construction including capital repairs in agriculture;
- own account construction including capital repairs in other industries;
- machinery and equipment produced for own capital formation, own account capital repairs.

47.　The corresponding tax, bookkeeping and reporting rules should be checked against ESA95 rules for each type of producer. In some cases, expert estimates may be necessary.

Tips

48.　The basic data required to include tips are often not available. Thus, all activities where tips usually appear should be identified, e.g., in relation to hotels and restaurants, repair services, personal services, hospitals and other health services, banks, insurance companies. Possible data sources and estimation methods are:
- the use of household budget survey data;
- special surveys and expert estimates;
- comparison of wages and salaries / mixed income ratios in these industry groups with the same ratios in other industry groups;
- rules for the taxation of tips.

Wages and salaries in kind

49.　There are two distinct types of income in kind:

- Goods and services produced by the employer, for example:
  - main production, e.g. coal or free train or railway tickets;
  - secondary production including the provision of sports, recreation or holiday facilities for employees and their families, free or cheap crèches for the children of employees.
- Goods and services purchased or financed by the employer, including:
  - meals and drinks, including those when travelling on business;
  - housing or accommodation services;

- uniforms or other forms of special clothing which employees choose to wear frequently outside the workplace as well as at work;
- the private use of business cars;
- the provision of sports, recreation or holiday facilities for employees and their families;
- free or cheap crèches for the children of employees.

50.   Several data sources are used for calculating income in kind, including:
- Tax data (the fiscal authorities sometimes publish data on income in kind)
- The Community Labour Cost Survey (LCS)
- Household Income and Expenditure Surveys
- Financial statements
- Special surveys and expert estimates.

51.   In practice, the two most widely used data sources are tax data and the LCS. In the case of data from the fiscal authorities, the tax rules and treatment need to be studied because some types of income in kind may be exempt from tax (or thresholds apply below which the income is exempt). Specific valuation rules are applied for taxing the use of company cars for private purposes.

52.   The LCS is an important source because items of income in kind are separately requested in the LCS and employers provide annual estimates for all employees in the sampled unit. Each country has the opportunity to introduce detailed questions about income in kind in its own LCS.

Secondary activities

53.   The coverage of all kind of secondary activities (sales of secondary products and of goods for resale, production for own GFCF and own final consumption) should be considered.

Valuation of exhaustiveness adjustments

54.   For VAT fraud without purchaser's agreement, a market price including VAT is assumed (see the Commission Decision on VAT fraud), whereas for other non-exhaustiveness types different prices from those associated with observed transactions may appear. Nevertheless, it can be expected that the prices include an element, which can be at least be partly related to the size of VAT and other taxes on products. This means, for example, that adjustments valued at basic prices would result in underestimates of GDP. Thus, it is essential to consider and document the valuation principles used for the GDP adjustments.
Taxes and subsidies on products

55.   Another valuation problem with possible impact on the level of GDP may appear when using data on gross output from producers valued at basic prices and data on taxes and subsidies on products from the budget. Thus, a description of the sources used, and how compliance with ESA95 rules is achieved, should be provided.

Reliability of quantity-price methods and product balances

56.   Industries for which additional completeness and reliability problems can be expected should be examined using product balances. Where quantity-price methods are applied (for example, in agriculture and construction, and sometimes in electricity, gas and water supply), the coverage of quantities and prices should be checked.

SUMMARY: BRIEF DESCRIPTIONS OF THE NON-EXHAUSTIVENESS TYPES (N1 TO N7)

57.   As an *aide memoire*, Figure II overleaf provides a brief description of each of the 7 types.

NON-EXHAUSTIVENESS TYPES: INCOME APPROACH

58.   As compilation by the income approach depends essentially on the same data sources as for the output approach, the same types N1-N7 are appropriate. However, as very few countries compile independent estimates of GDP by the income approach, assessment of non-exhaustiveness for the income approach does not provide much additional information and was not requested by Eurostat for the Tabular Approach to Exhaustiveness (TAE) project undertaken in 2003. Nevertheless, the countries applied the TAE for the income approach to GDP. An example of the results obtained by the Czech Republic for the year 2002 is given in Chapter 4 of these Guidelines.

NON-EXHAUSTIVENESS TYPES: EXPENDITURE APPROACH

59.   Types N1-N7 can be applied to analysis by the expenditure approach but only in so far as the basic data are obtained from producer surveys. For other data, it is not so clear what are to be regarded as basic data and what are regarded as adjustments.

60.   In particular, in the case of private household consumption, different sources are appropriate for different commodities and it is difficult to define precisely what constitutes non-exhaustiveness. One approach is to identify the principal source and to define the use of any other source as an exhaustiveness adjustment. Another approach is to identify the best source for each commodity and to state that the use of any other source implies that an exhaustiveness adjustment is required.

61.   An example of the results obtained by the Czech Republic for the year 2002 is given in Chapter 4 of these Guidelines.

Figure II - Brief descriptions of each of the non-exhaustiveness types (N1 to N7)

N1	**Producer should have registered (underground producer)**	➢ Producer fails to register in order to avoid tax & social security obligations. These are often small producers with turnovers which exceed the thresholds above which they should register their income. ➢ Producers that fail to register because they are involved in illegal activities fall under N2, rather than N1. ➢ Type N1 does not include all underground activities, some of which are associated with type N6.
N2	**Illegal producer that fails to register**	➢ N2 covers activities of producers that avoid registration entirely. ➢ N2 excludes illegal activities by registered legal entities or entrepreneurs that report (or misreport) their activities under legal activity codes.
N3	**Producer is not obliged to register**	➢ Producer is not required to register because it has no market output. Typically, these are non-market household producers involved in: (a) production of goods for own consumption or for own fixed capital formation, and (b) construction of and repairs to dwellings. ➢ Producer has some market output but it is below the level at which the producer is expected to register as an entrepreneur.
N4	**Registered legal person is not included in statistics**	➢ The legal person may not be included in the statistics for a variety of reasons. E.g., the business register is out of date or updating procedures are inadequate; the classification data (activity, size or geographic codes) are incorrect; the legal person is excluded from the survey frame because its size is below a certain threshold; etc.
N5	**Registered entrepreneur is not included in statistics**	➢ A registered entrepreneur may not be included in the statistics for many reasons. E.g., the administrative source with lists of registered entrepreneurs may not always pass on complete or up to date lists to the statistical office. ➢ Even if there is a regular flow of accurate and comprehensive information from the administrative source to the statistical office, the registered entrepreneur may not be included in the business register for several reasons (see those given under N4).
N6	**Mis-reporting by the producer**	➢ Mis-reporting invariably means that gross output is under-reported and intermediate consumption is over-reported in order to evade (or reduce) income tax, value added tax or social security contributions. ➢ Mis-reporting often involves: the maintenance of two sets of books; payments of *envelope salaries* which are recorded as intermediate consumption; payments in cash without receipts; and VAT fraud.
N7	**Statistical deficiencies in the data**	➢ In Figure I above, type N7 is sub-divided between **N7a** - data that is incomplete, not collected or not directly collectable, and **N7b** - data that is incorrectly handled, processed or compiled by statisticians. This distinction is useful because it helps one to better understand the huge variety of possible statistical deficiencies. However, in practice, N7a and N7b cannot always be easily separated. ➢ Statistical deficiencies: the following list is not comprehensive but these topics should be investigated for non-exhaustiveness: - • Handling of non-response; • Production for own final use by market producers; • Tips; • Wages & salaries in kind; • Secondary activities. ➢ Clearly, not all statistical deficiencies result in the under-estimation of GDP. The focus has been to illustrate those areas which are likely to lead to non-exhaustiveness in the NA.

[1] Supplementary information on illegal activities is given in section 5 of this Annex.
[2] Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovak Republic & Slovenia.
[3] For other N types, gross output and intermediate consumption are normally both understated, so that exhaustiveness adjustments are positive. The adjustments to intermediate consumption therefore partly offset the adjustments to gross output