Outline

• Introduction
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• Links between production and income approach GDP
• Links between production and expenditure approach GDP
• Non-observed economy (NOE problem areas), estimating NOE
• Eurostat tabular framework (Non-Exhaustiveness Types: N1 to N7)
• Findings from Eurostat and OECD studies on country experiences in improving GDP exhaustiveness
Introduction

• For ensuring GDP exhaustiveness, it is necessary that all the economic activities undertaken in the economy are appropriately measured and included in GDP estimates.

• Measuring GDP exhaustively is a challenging task in the developing countries due to absence of part of the required source data.

• For achieving GDP exhaustiveness, the following two documents provide guidance in a structured manner
  – *Measuring the non-observed economy: A handbook* (OECD, et al, 2002), and
Approach to achieving GDP exhaustiveness

- Among the three approaches for measuring GDP (production, income and expenditure), exhaustiveness primarily refers to the production approach
  - Estimates comply with production boundary (see reading material: presentation 1 on GDP estimates through three approaches)
- Since the three approaches are conceptually consistent and give raise to a single estimate of GDP, exhaustiveness on the production side (or supply side when imports are added) reflects on the expenditure side as well, when supply and use tables and commodity flow methods are applied.
  - For example, output of own account construction of dwellings and farm buildings if accounted for on the supply side, the same can be included on the use side under gross fixed capital formation.
  - Similarly, output of paid domestic servants and services of owner occupied dwellings have correspondence with household final consumption expenditure on the use side.
Links between production and income approach GDP

- The starting point for ensuring GDP exhaustiveness should be the detailed examination of data sources and compilation methods used to measure production approach GDP.
- The most common of the adjustment methods include the labour input method, commodity flow method, special surveys and the use of fiscal and other audit data.
- Once adjustments are made on the production GDP, it is easier to make corresponding adjustments on the income approach GDP, since operating surplus is derived residually.

<table>
<thead>
<tr>
<th>Item</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Output of goods and services</td>
<td>100</td>
</tr>
<tr>
<td>2. Intermediate consumption of goods and services</td>
<td>40</td>
</tr>
<tr>
<td>3. Gross value added (1-2)</td>
<td>60</td>
</tr>
<tr>
<td>4. Compensation of employees</td>
<td>25</td>
</tr>
<tr>
<td>5. Consumption of fixed capital</td>
<td>5</td>
</tr>
<tr>
<td>6. Other taxes less subsidies on production</td>
<td>3</td>
</tr>
<tr>
<td>7. Net operating surplus (3-4-5-6)</td>
<td>27</td>
</tr>
</tbody>
</table>
Links between production and expenditure approach GDP

- Links between production and expenditure GDP, use of supply and use framework and commodity flow methods, help in making adjustments on the expenditure GDP

<table>
<thead>
<tr>
<th>Information available in the Production approach</th>
<th>Links with Expenditure Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output of general government = Intermediate consumption + own account capital formation + Compensation of employees + Consumption of fixed capital + Taxes on products, net of subsidies, paid by government to itself</td>
<td>Government final consumption expenditure (GFCE) = Output – Sales and fees + Expenditure on social benefits in kind</td>
</tr>
<tr>
<td>Output of construction</td>
<td>GFCEF (construction) = Output of construction – minor repairs and maintenance + acquisition costs</td>
</tr>
<tr>
<td>Output of dwelling services</td>
<td>HFCE on rentals of dwellings</td>
</tr>
<tr>
<td>Output of paid domestic services</td>
<td>HFCE on paid domestic services</td>
</tr>
</tbody>
</table>

Additional data that can be compiled while analysing the source data for preparing production GDP

<table>
<thead>
<tr>
<th>Change in inventories with all producers</th>
<th>Change in inventories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expenditures made on acquisition less disposal of fixed assets plus output of own account production of capital items (construction, mineral exploration, R&amp;D expenditures, databases, etc), by all producers &amp; households</td>
<td>GFCF</td>
</tr>
<tr>
<td>Domestic production plus imports of machinery and equipment</td>
<td>GFCF, with suitable adjustments for taxes on products, trade and transport margins and acquisition costs.</td>
</tr>
</tbody>
</table>
Non observed economy

The OECD, et al. handbook on NOE categorises the problem areas in achieving GDP exhaustiveness under following five headings:

– Economic Underground
  • (1) Underground Production
  • (2) Illegal Production
  • (3) Informal Production
– (4) Household Production for own final use
– (5) Statistical Underground

• The five categories are not mutually exclusive.
• The NOE activities primarily concern the production approach GDP
• Accounting NOE ensures that the GDP estimates comply with the production boundary
(1) Underground production

• The 2008 SNA defines underground economy as legal production activities that fall within the production boundary of the SNA but deliberately concealed from public authorities for the following kinds of reasons:
  – To avoid the payment of income, value added or other taxes;
  – To avoid the payment of social security contributions;
  – To avoid having to meet certain legal, etc.; and
  – To avoid complying with certain administrative requirements such as minimum wages, maximum hours, safety or health standards.

• Sometimes, countries include underground production in some activities when estimates are compiled globally, for example, crop production when total area is considered and construction when commodity flow methods are used

• NOE component is derived residually as global estimate minus observed part
Estimating underground production (1/2)

Handbook suggests 3 types of surveys/studies to estimate *underground production*:

- **Special surveys of underground production, labour, expenditure, income, etc.**
  - Surveys of expenditures on goods and services: addressed to purchasers whether receipt was given by the seller; or from those likely to be operating underground
  - Surveys of labour input and income associated with underground production: survey on employed persons to assess the labour input engaged in underground production
  - Surveys of time use: can provide information for allocating productive time spent as own account worker and to identify the kind of work carried out on own account

- **Business and household opinion surveys**
  - addressed directly to senior managers about underground activities in their own sector of activity. Gives some indication of the magnitude of underground activities

- **Audit data and special studies carried out by the taxation authorities**
  - Tax audits may provide information, but they may not provide an estimate of the extent of underground production, as tax audits are infrequent, subjectively chosen and restricted to few industry classes.

- These surveys have limited applicability in developing countries. A more useful approach is to consider underground production as falling into the following two possible categories
Estimating underground production (2/2)

**Activities that are underground because the enterprises conducting them are not registered**

- These are usually small enterprises in size (in terms of employment and/or income). Such units can be covered through direct or indirect methods suggested earlier.

**Activities that are underground because enterprises conducting them (although registered) under-report**

- Some overall idea of the magnitude of underreporting in specific industries may be obtained through commodity balances or by applying technical coefficients or structural ratios. For example, crop production may be estimated from seed consumption or area under crops; output of some manufactured products from electricity consumed.
  - carefully scrutinize data reported at the establishment level in the background of established ratios, such as input-output ratios or electricity consumption.
  - tax audits, generally confined to few activities and not comprehensive.
  - make adjustments on supply side while confronting supply side data with use side information in the supply-use framework.
(2) Illegal activities

- *Illegal production* is defined as “all illegal actions that fit the characteristics of transactions – notably that there is mutual consent – are treated in the same way as legal actions”

- There are two kinds of illegal production:
  - The production of goods or services whose sale, distribution or possession is forbidden by law (for example, manufacture and distribution of narcotics, illegal transportation in the form of smuggling of goods and of people, and services such as prostitution);
  - Production activities that are usually legal but become illegal when carried out by unauthorized producers; for example, unlicensed medical practitioners

- Both kinds of illegal production are included within the production boundary
Methods to account for illegal activities (1/2)

• It is difficult to collect data on illegal activities through direct surveys
• NOE Handbook suggests using the supply use equation as the best option
• **Drugs**
  – Special studies carried out by universities/research institutes or based on police data on seizures on production side
  – Estimates of number of addicts and average quantities on consumption side
  – Exports of drugs can be estimated as a residual item, i.e., as domestic output plus imports minus consumption minus seizures.
• **Prostitution**
  – Health care organisations, police or special studies
  – Estimates of average number of clients and average price
  – Breakdown into different kinds of prostitutes may be needed, as prices vary
  – Estimates of prostitution services include a variety of services, such as procurement, rents of rooms, etc. Breakdown of these services is needed
Methods to account for illegal activities (2/2)

• *Problems of double counting*
  
  – Sometimes, output of illegal activities is declared to the tax authorities or covered under statistical surveys under the guise of a legal activity, so that part of the earnings become legitimate.
  
  – Secondly, persons engaged in illegal activities may report as employed in the labour force surveys under legal activities. By the residual methods that are generally adopted to estimate total labour input in informal sector, employees in illegal activities get included in the informal sector employment and consequently in the production estimates when labour input methods are adopted.
  
  – Thirdly, on the expenditure side, payments for ‘bribes’ or ‘prostitution services’ may be shown under other costs or personal services by the businesses or households.
  
  – One way to avoid double counting output is careful research into the contents of the basic data used for the regular compilation of the national accounts, consistent recording of adjustments for illegal activities in all three approaches to GDP and the application of supply-use framework.
(3) Informal sector

- Informal sector is defined by the 15th ICLS as “units engaged in production of goods/services with primary objective of generating employment and incomes to the persons concerned”. These units typically operate at low level of organization, with little/no division between labour and capital and on a small scale. Labour relations, where they exist, are based mostly on casual employment, kinship or personal and social relations rather than contractual arrangements.
- This is the most important component of NOE and accounts for major share of GDP estimates in developing countries.
- Previous session dealt exclusively on accounting for informal sector in GDP estimates.
(4) Household production for own final use

- The household production for own final use includes production of crops, livestock, other goods, construction of own houses, imputed rents, and services produced by domestic servants for own final consumption.

- However, in practice, certain goods produced for own final use (such as storage of grains, threshing of grains, fetching water, etc.) are ignored from GDP compilations, if their contribution is insignificant.

- Valuation of own final use
  - equivalent market prices, if available.
  - Otherwise, it is valued on costs, i.e., as sum of intermediate consumption, compensation of employees, consumption of fixed capital and other taxes on production. There will be no subsidies on such production.
Agricultural production for own consumption

• **Crops**: Generally included in the production estimates due to the global methods used for estimating overall agricultural production in the economy, such as gross area under crops

• **Crops grown in backyard**: Estimates for such backyard (kitchen garden) production can be made on the basis of area of homestead (house with a building and surrounding land) land, data on which may be available with local authorities or can be estimated using small surveys or conducting studies.

• **Subsistence fishing and gathering for forest produce (firewood, berries, honey and other minor forest produce)**:
  
  – Data on production for own final consumption can be collected through household surveys or through special studies carried out by fisheries development boards/forest departments.
  
  – Sometimes, it is possible to estimate the total production of fisheries and minor forest products in the country from the household budget surveys. Adjustments for intermediate and other final uses need to be made, using the identity of *supplies equal uses*. 

Economic Commission for Africa
www.uneca.org
Paid domestic services

- By convention, output of domestic staff is equal to the compensation of employees paid to them.
- This should include wages in kind, such as free accommodation, meals, shoes, and clothing provided to the domestic staff, which are important part of the total wages paid to the domestic staff.
- Income in kind is valued at the costs to the employer of providing the goods and services they receive as part of their wages.
- Population censuses and household labour force surveys may provide data on the total number of persons employed in domestic services. Labour force surveys and household budget surveys may also include questions on wages received in kind and cash by activities. Average income per employee can also be estimated from small-scale ad-hoc surveys,
Own account construction of dwellings

• Estimates can be made using (i) estimated growth rates in stock of houses, and (ii) estimated replacement rates in the stock of houses in a base year.
  – The growth of dwellings can be assumed to be some function of the growth of population.
  – Suppose that on average an own-constructed dwelling lasts for 19 years and the population is growing at 1.8% each year. Suppose also that there were 46,000 dwellings at the beginning of the year. With these assumptions there will have to be $0.018 \times 46,000 = 828$ new dwellings and $46,000/19 = 2,421$ replacement dwellings constructed in the course of the year, i.e. $828 + 2,421 = 3,249$ dwellings.
  – Output of own account construction is normally estimated as the sum of its costs of production.
    • Purchased inputs are valued at their purchasers’ prices and the labour input equals the time taken multiplied by a wage rate. The minimum rural wage could be used as the wage rate.
Owner occupied dwelling services (1/2)

• A general SNA rule is that own-account output should be valued at the basic prices at which they could be sold on the market. If no market prices are available, output is estimated on cost basis.

(i) Equivalent market rental approach
  – Data on dwellings by region and type available from census
  – These data extrapolated to the current year to obtain stock of dwellings in the current year
  – Average rental data may be available from CPI surveys or HES
  – Cost of the house and dividing by length of life of house can also give an acceptable (if still very imperfect) measure of rental equivalent
Owner occupied dwelling services (2/2)

(ii) User cost method: when SNA standard rule cannot be applied

• When few dwellings are rented that rents actually paid cannot be regarded as typical.
  – most dwellings available for rent are occupied by foreigners or by employees of government or large public enterprises;
  – dwellings may only be available for rent in the capital or major cities

• The user cost method consists of estimating each of the costs that owners of dwellings would need to take into account in fixing a market rent if they decided to rent their dwellings to other people rather than living in them themselves

| Output = | intermediate consumption (repair and maintenance, insurance charges and FISIM) + net other taxes on production + CFC + net operating surplus (NOS) |
| CFC = | d*S, where d = rate of depreciation and S = value of stock of dwellings at current price |
| NOS = | r*S, where r = real interest rate |

Other methods

– household expenditure survey or the housing surveys collect information on estimated rental value of the dwellings in which the owners live.

– value of each dwelling is assessed by tax authorities for the purpose of levying building tax or property tax. This type of information is typically maintained by local authorities such as the municipalities.
User cost approach (1/2)

Intermediate consumption, FISIM and Taxes on production

• Information on repairs and maintenance and insurance could come from a household budget survey.

• FISIM on dwelling loans (to be allocated on the basis of loans taken for dwellings), and insurance charges (to be estimated from premiums paid and claims received) may be available from national accounts compilations.

• Land and property taxes, if any, should be available from the tax authorities.

Value of stock of dwellings (for estimating CFC and NOS)

• Estimates of value of stock of dwellings need to be prepared through perpetual inventory method based on long-term estimates of GFCF in respect of dwellings.

• An alternative is to estimate capital stock of dwellings using simpler methods suggested in the OECD Manual on measuring capital stock, based on current year’s GFCF and some assumptions on GFCF growth.

• Another short-cut method is to assume half the price of a new building in the current year as the average value of dwellings in the country. This value multiplied by the number of dwellings of the same type can provide an estimate.
User cost approach (2/2)

Consumption of fixed capital

• For estimating CFC, *depreciation rate* used is usually written as $D/L$, where $D$ is the “declining balance rate” and $L$ is the average service life of the assets.

• $D$ is usually assumed to lie between 1 and 2, usually set at 1.6

• For example, if the average life of dwellings is 70 years, the *depreciation rate* $d$ will be: $\text{Stock} \times \frac{1.6}{70}$ or $\text{Stock} \times 0.023$.

• If mid-year net value of the stock of a particular type of owner-occupied dwelling is 4000, and average life for that type of dwelling is 70 years, CFC = 4000*(1.6/70) = 91.

Net operating surplus

• For estimating NOS, an estimate of real interest is required. This is the value that people expect to earn at least on their investments.

• Real interest rate is estimated as long-term average of nominal interest rates minus long-term inflation rates.

• Nominal interest rates could be based on the rate of return on ten-year government bonds or the rate on housing loans.
### WORKSHEET TO ESTIMATE OUTPUT THROUGH USER COST APPROACH

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description of the item</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Intermediate consumption</strong></td>
<td></td>
</tr>
<tr>
<td>UC 01</td>
<td>Expenditure on maintenance and repair of owner-occupied dwellings</td>
<td></td>
</tr>
<tr>
<td>UC 02</td>
<td>Gross insurance premiums paid on owner-occupied dwellings</td>
<td></td>
</tr>
<tr>
<td>UC 03</td>
<td>Insurance claims paid to owners (minus)</td>
<td></td>
</tr>
<tr>
<td>UC 04</td>
<td>Net insurance premiums paid by owners. (UC 02) – (UC 03)</td>
<td></td>
</tr>
<tr>
<td>UC 05</td>
<td>Total intermediate consumption. (UC 01) + (UC 04)</td>
<td></td>
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<tr>
<td></td>
<td><strong>Other taxes on production</strong></td>
<td></td>
</tr>
<tr>
<td>UC 06</td>
<td>Taxes paid by owners on dwelling services</td>
<td></td>
</tr>
<tr>
<td>UC 07</td>
<td>Taxes paid by owners on value of owner-occupied dwellings and their associated land</td>
<td></td>
</tr>
<tr>
<td>UC 08</td>
<td>Total taxes paid by owners. (UC 06) + (UC 08)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Consumption of fixed capital</strong></td>
<td></td>
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<tr>
<td>UC 09</td>
<td>CFC on owner-occupied dwellings at current prices (excl land)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Net operating surplus</strong></td>
<td></td>
</tr>
<tr>
<td>UC 10</td>
<td>Current market value of the stock of OODs at the beginning of the year (incl. land)</td>
<td></td>
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<tr>
<td>UC 11</td>
<td>Current market value of the stock of OODs at the end of the year (including land)</td>
<td></td>
</tr>
<tr>
<td>UC 12</td>
<td>Current market value of the stock of OODs at mid-year (including land)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(((UC 10) + (UC 11))/2)</td>
<td></td>
</tr>
<tr>
<td>UC 13</td>
<td>Real rate of return on OODs (including land) in percent per annum.</td>
<td></td>
</tr>
<tr>
<td>UC 14</td>
<td>Real net operating surplus. (UC13) * (UC12)/ 100</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Expenditures on owner-occupied dwelling services</strong></td>
<td></td>
</tr>
<tr>
<td>UC 15</td>
<td>Expenditure on owner-occupied dwelling services UC05 + UC 08 + UC09 + UC14</td>
<td></td>
</tr>
</tbody>
</table>
(5) Statistical underground

- The *statistical underground* refers to production missed due to deficiencies in data collection programme, under-coverage of enterprises in the business register and survey frames, non-response, under reporting and conceptual issues (such as incorrect treatment of tips, wages and salaries in kind).

- These errors can be divided into two parts:
  - Data are obtained from enterprises, but are misreported by the respondent in such a way as to underreport value added, or
  - Correct data are received but are inappropriately edited or weighted

- In certain cases, incorrect adjustments made for statistical underground could result in over-estimation of GDP as well, therefore, care should be taken to avoid either over or under estimation of output in national accounts.
Eurostat tabular framework

• The Eurostat tabular approach to exhaustiveness (TAE) was designed to identify potential sources of underestimation of GDP, based on two principal questions:
  • producer is not surveyed, and
  • producer is surveyed but data is not adequate
• The TAE classifies non-exhaustiveness types under 7 different types N1 to N7
  – Some categories of non-exhaustiveness in the national accounts could be classified under different N-types. For example, an informal sector unit could be classified under either of N3, N4 or N5
  – Therefore, the key aspect in the TAE is to ensure that all potential sources of omission from the national accounts are identified and included in one or other N-type categories and that there is no duplication across categories
• Suggests methods (such as the labour input method, fiscal audits, VAT comparisons, etc.), to make adjustments for non-exhaustiveness types
Non-Exhaustiveness Types (N1 to N7)

- The different types of non-exhaustiveness - N1 to N7 have been defined by making use of *producers’ characteristics* and *data sources used* for the production approach.

- A *producer* may not be covered by surveys/administrative source because:
  - it fails to register as 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 it is not surveyed (N4); or
  - it is a registered entrepreneurship but it is not surveyed (N5).

- Producers are in scope of surveys/administrative source, but the *resulting data may not be adequate* because:
  - the producer intentionally misreports (N6); or
  - there are statistical deficiencies in the data (N7) - some data are simply not collected (N7a), or some data are not correctly processed (N7b).
## Descriptions of Non-Exhaustiveness Types (N1 to N3)

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N1</td>
<td>Producer fails to register in order to avoid tax &amp; social security obligations. Mostly small producers with turnovers exceeding the threshold limits for registration. Producer should have registered (underground producer). N1 does not include producers that fail to register because they are engaged in illegal activities (covered in N2). Type N1 does not include all underground activities, some of which (mis-reporting) are associated with type N6.</td>
</tr>
<tr>
<td>N2</td>
<td>N2 covers activities of producers that avoid registration entirely. These producers come under the ambit of registration in terms of threshold limits, but do not register because they are engaged in illegal activities, such as prostitution, sale of drugs, etc. N2 excludes illegal activities by registered legal entities or entrepreneurs that report (or misreport) their activities under legal activity codes (already covered in GDP).</td>
</tr>
<tr>
<td>N3</td>
<td>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, (b) construction of and repairs to dwellings, (c) paid domestic services, etc. (household production that falls under SNA production boundary for own final use) Producer has some market output but it is below the level at which the producer is expected to register as an entrepreneur. (Typically, these are informal sector units as defined in 15th ICLS, but also would include agricultural producers).</td>
</tr>
</tbody>
</table>
## Descriptions of Non-Exhaustiveness Types (N4 to N5)

<table>
<thead>
<tr>
<th>Not surveyed</th>
<th>N4</th>
<th>Registered legal person is not included in statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>- 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 laid down for surveys; etc.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>N5</th>
<th>Registered entrepreneur is not included in statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- 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.</td>
</tr>
<tr>
<td></td>
<td>- 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 (as in N4).</td>
</tr>
</tbody>
</table>
## Descriptions of Non-Exhaustiveness Types (N6 to N7)

<table>
<thead>
<tr>
<th>Mis-reporting</th>
<th>N6</th>
<th>Mis-reporting by the producer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>➢ 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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>➢ 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 (generally the underground production not included in the data reported)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Others</th>
<th>N7</th>
<th>Statistical deficiencies in the data</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>➢ 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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>➢ Statistical deficiencies: the following list is not comprehensive but these topics should be investigated for non-exhaustiveness:-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>➢ Handling of non-response; Production for own final use by market producers; Tips; Wages &amp; salaries in kind; Secondary activities.</td>
</tr>
</tbody>
</table>
Identification and adjustment methods for types of non-exhaustiveness (1/10) N1

N1. Producers Deliberately Not Registering – Underground

• Typically N1 involves small producers with turnovers exceeding thresholds above which they should register, but have not registered to avoid tax & social security obligations

• Adjustment methods:
  – Labour input method
  – Other supply-based methods: Standard input/output and input/value added ratios are used to calculate output and value added estimates from the input data
  – Demand-based methods: output estimate based on household expenditures, export of commodities; motor vehicle registrations, building permits, etc.
  – Income-based approach: based on income taxes, social security contributions paid by self-employed persons or private entrepreneurs, etc.
  – Commodity flow method and supply-use tables: available information on supply or use side of a particular product is used to estimate missing components on the supply or use side, so that total supplies of the product equals total uses of the same product
Identification and adjustment methods for types of non-exhaustiveness (2/10) N2

N2. Producers Deliberately Not Registering – Illegal

- Refers to the activities of producers engaged in illegal activities and avoid registration entirely.
- Excludes the part that is reported under legal activities (already included in GDP)
- Adjustment methods:
  - quantity-price method, unit per input or use, and expert judgment. The methods suggested under N1 can also be applied to account for this type of producers, although not separately.
- The general approach suggested for estimating N2 is that each type of illegal activity (such as prostitution, sale of stolen goods, sale of drugs, smuggling, gambling, etc.) be treated separately and its total output estimated first. From this, the part that is reported as a legal activity be subtracted to obtain an estimate for N2, as shown below:
  - Compile the estimate of all illegal activities of that particular type;
  - Compile an estimate of illegal activities that is likely to have been reported under legal activities;
  - Subtract the second estimate from the first and record the result under type N2.
- However, it may not be easy in practice to detect the output of illegal activities that has been reported under legal activities. If no adjustments are made on account of this, there could be duplication of output. Therefore, a careful scrutiny of reported data is required with some inputs from special studies undertaken in the past and experts’ opinions.
Identification and adjustment methods for types of non-exhaustiveness (3/10) N3

**N3. Producers Not Required to Register –below threshold limit and non-market producers**

- N3 includes
  - (a) non-market household producers which are involved in
    - (i) production of goods for own final consumption and for own fixed capital formation;
    - (ii) construction of dwellings, extensions to dwellings, and capital repairs of dwellings;
  - (b) unincorporated household enterprises that have very small-scale market output.
- Agriculture producers
  - N3 does not include agricultural production, when output is obtained as quantity * price
  - N3 includes non-agricultural productive activities of households, that are not registered
- Adjustment methods
  - **Producers with no market output**: household expenditure surveys, building permits, commodity-flow methods, administrative data and time use surveys
  - **Producers with market output**: Informal sector surveys, household surveys, mixed household and establishment surveys and labour input methods
Identification and adjustment methods for types of non-exhaustiveness (4/10) N4 and N5

**N4. Legal Persons Not Surveyed; N5. Registered Entrepreneurs Not Surveyed**

• A producer can be a legal person and registered but not included in the business register maintained by the statistical office
  – 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.
• All such producers should be covered by means of a survey or administrative collection conducted without use of the register.
  – Those registered units which are excluded from the surveys due to the size criteria (employment, mainly) or other criteria (omission of specific activities from the surveys), can be covered through benchmark (say, once in 5 years) surveys for compiling a set of benchmark estimates.
  – Also, household surveys, mixed household and establishment surveys and labour input methods can provide estimates
Identification and adjustment methods for types of non-exhaustiveness (5/10) N6

**N6. Producers Deliberately Misreporting**

- To understate gross output and/or overstate intermediate expenditure.
- Largest of all exhaustiveness adjustments and sometimes add up to 6% to GDP.
- 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.
- Adjustment methods
  - Comparison of wages & salaries per capita with norms by sector, industry and size groups.
  - Comparison of intermediate consumption/gross output ratios or output/employment 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.
Identification and adjustment methods for types of non-exhaustiveness (6/10) N7

N7. Other Statistical Deficiencies

• Possible non-exhaustiveness areas:
  – handling of non-response;
  – production for own final use by market producers;
  – tips;
  – wages and salaries in kind;
  – secondary activities.

• Other possible types of error in data collection and compilation
  – Poor questionnaire design through to the compilation methods
  – valuation of exhaustiveness adjustments;
  – estimates of taxes and subsidies on products;
  – reliability of quantity-price methods and product balances.
Identification and adjustment methods for types of non-exhaustiveness (7/10) N7

Handling of non-response

• Appropriate non-response adjustments have not been made by the survey statisticians and thus need to be made by national accountants.
• Imputation may be based on data for the previous year, data from similar units (industries, size groups), or industry by size group averages or based on employment.

Production for own final use by market producers

• Production of agricultural or other products in the household sector for own final use
• 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/equipment produced for own capital formation, own account capital repairs.
• Adjustment methods: A detailed investigation of business accounts, careful designing of survey questionnaires, commodity flow methods and expert judgements
Identification and adjustment methods for types of non-exhaustiveness (8/10) N7

**Tips**

- Usually in hotels and restaurants, repair services, personal services, hospitals and other health services, banks, insurance companies
- Adjustment methods could be based on
  - 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, if any.
Identification and adjustment methods for types of non-exhaustiveness (9/10) N7

Wages and salaries in kind

- Goods and services produced by the employer,
- Goods and services from the secondary production or purchased or financed by the employer:
  - 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.
- data sources used for calculating income in kind:
  - Tax data (the fiscal authorities sometimes publish data on income in kind or fringe benefits)
  - The Community Labour Cost Survey (LCS), if it exists
  - Household Income and Expenditure Surveys
  - Financial statements of companies/businesses/government
  - Special surveys and expert estimates
Identification and adjustment methods for types of non-exhaustiveness (10/10) N7

Secondary activities

• The coverage of all kinds of secondary activities should be considered while designing questionnaires for businesses or estimating output from financial statements of companies/businesses.

• While using quantity valuation methods, it is likely that secondary activities get missed

Taxes and subsidies on products

• Differences in the tax data reported by producers and that from the budget. Reconciliation between the two sets of data and transition from basic prices to purchasers’ prices is required

Reliability of quantity-price methods and product balances

• 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.
Findings from Eurostat study in 9 countries (1/3)

Methods employed to identify and estimate exhaustive adjustments

<table>
<thead>
<tr>
<th>Method used</th>
<th>N1</th>
<th>N2</th>
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<th>N4</th>
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<td>1. Labour input method</td>
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<td>3. Supply-use method</td>
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<td>4. Expert judgement</td>
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<td>5. Quantity price method</td>
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<td>6. Margin approach</td>
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<td>7. Administrative data</td>
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<td>8. Fiscal and other audit data</td>
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<td>9. Theoretical vs actual VAT</td>
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<td>10. Special or existing survey</td>
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<td>11. Demand based method</td>
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Findings from Eurostat study (2/3): country experiences

• N1: Comparing LFS data with other sources, estimates of IC and VAPW
• N2: Prostitution earning estimates based on sources including telephone inquiries for home-based prostitution; IC is estimated as 20%. Sales of stolen goods, based on crime statistics for thefts of passenger cars, margins 10%. Drug consumption estimates are made from demand (as product of number of consumers, average quantity consumed and street prices) and supply sides (as product of imports destined for the country and street prices adjusted for import purity and street purity).
• N3: Non-reported revenues of agricultural products assumed to be same as reported sales. Household services based on number of persons from LFS data, (expressed in full time equivalents) multiplied by the approximate average wage.
• N4: Updating BR using the income tax payers’ database and grossing up for all units
• N5: Sculptors, painters, writers, journalists, professional sportsmen, etc., who are not registered in the BR. Adjustment based on incomes reported in tax returns
Findings from Eurostat study (3/3): country experiences

N6: Special survey of accountants, tax and financial advisors and auditors. Questions included NACE, numbers of employees, reasons for and degree of misreporting, concealed sales/revenues; overstated material costs; overstated costs of services; concealed wages & salaries.

N7: Income in kind covered under the heads of Wages & salaries in kind (taxable), meal vouchers, contributions from social funds, per diem for business trips, expenditures on clothing of regular members of the armed forces, other social expenditure (covered from costs), housing contribution, goods at a reduction and provided free of charge, remitted interest, company cars used for personal needs, board and lodging provided free of charge or at reduced prices: sources are costs and revenue surveys, labour cost surveys, experts’ estimates.

Tips: Estimates based on final consumption expenditures of households and foreign visitors and local practices based on expert opinions, the share varies from 3% to 10%. Also, based on numbers of persons carrying out the activities, the amount of tips per day and the average number of working days per year.
OECD Study on NOE in Western Balkan Countries

Findings show

• That these countries relied mainly on
  – “expert method” which involves consulting tax inspectors, accountants and other persons with relevant knowledge,
  – labour input methods based on labour force surveys or derivatives
  – Ad hoc surveys
  – supply-use methods for improving GDP exhaustiveness

• NOE is mostly in
  – household sector (among the institutional sectors)
  – trade activity (among the activities)

• Improvements are needed in the method of estimation of dwelling services, goods for own consumption, illegal activities and government consumption of fixed capital
Concluding remarks

• Labour input methods can provide a feasible option to achieve GDP exhaustiveness;
• Surveys conducted by UNECE and the OECD provide country practices on accounting for other problem areas in achieving GDP exhaustiveness;
• TAE is based on the European country practices of compiling national accounts and the underlying data sources (BR, financials statements, industry surveys, etc.). The non-exhaustiveness component in these countries is not large.
• Such comprehensive data sources for compiling national accounts may not exist in several African developing countries. Also, the informal sector is a large part of non-exhaustiveness in these countries.
• Therefore, if the developing countries plan to achieve exhaustiveness in GDP, priority should be accorded to account for informal sector in national accounts
• The *ad hoc* surveys, labour input methods, commodity flow methods, and expert estimates suggested in the TAE can be applied in developing countries
• More resource intensive methods such as the tax audits, updating the BR, surveys for estimating underground production and mis-reporting, etc. could be taken up depending upon the availability of resources.
Suggested reading

– Operational Guidebook on Accounting for Informal Sector in National Accounts (Draft version): United Nations Economic Commission for Africa (Chapters 3 and 4)

– Measuring the non-observed economy: A handbook (OECD, et al, 2002), and