Candidate Country Exhaustiveness Project, 2002

Guidelines Annex E[1]

Non-Exhaustiveness Identification and

Exhaustiveness Adjustment Methods

Introduction

The following paragraphs summarise some of the major methods for identifying non-exhaustiveness and for developing exhaustiveness adjustments. More details are provided in the NOE Handbook.

Labour Input Method

The labour input method is the principal global verification method for compilation by the output approach. Application of the method as a check is required by 1994 Commission Decision on Exhaustiveness. The method is described in Section 4.2 of the NOE Handbook (in the context of data confrontation and global assessment) and in Section 5.4 (in the context of adjustment). More details are provided by Hayes (1996), Hayes and Lozano (1998) and Calzaroni (2000).

The elements of the method are as follows.

- *Estimate the labour input underlying GDP estimates.* This means deriving the labour input that is present (explicitly or implicitly) in the data sources used to derive GDP estimates. If the data are derived from enterprise surveys, then the labour input to the production covered by these surveys must be estimated.

- *Estimate the labour input based on household survey data.* Typically these data are obtained from a labour force survey, supplemented by census data if available.

- *Standardise the labour input estimates.* Convert the enterprise based (use) and household based (supply) estimates of labour input to the same units of labour input, such as hours worked or full-time equivalent employment units, so that they can be meaningfully compared.

- *Compare the two sets of estimates*. Analyse any discrepancies taking into account the reliability of the different sources. A surplus of labour input derived from the household source over that from the enterprise source is an indication of non-observed production. It provides a lower bound as some labour input could be missing from both sources. No

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difference or a surplus of the enterprise-based labour input over the household-based input suggests that the household data are not providing extra coverage.

Compilation of reliable adjustments requires detailed labour force data, including employment breakdown by industry and size group of employer, capacity to calculate full time equivalent employment, and output and value added per capita ratios by industry and size group. Such data are not currently available in all CCs, which limits application of the method. However, given the current focus on LFS programmes, the availability of data is improving.

Other Reconciliation Methods

Data confrontation and reconciliation are at the core of national accounts compilation. Confrontation and reconciliation methods are part of the general national accounts toolbox and not particular to the quest for exhaustiveness. The reason they might be given particular emphasis in the Exhaustiveness Project is that non-observed activities are precisely the sorts of activities that give rise to imbalances in the basic data, and conversely, data imbalances provide evidence of non-observed activities.

The NOE Handbook Chapter 4 lists a broad range of data comparisons that can be considered, including:

- comparison of *theoretical VAT* (i.e., VAT corresponding to transactions according to the national accounts) with *actual VAT* (i.e., VAT collected by taxation authorities). In making the comparison account has to be taken of the types of units, the thresholds for VAT obligation, industry classification, etc. As a measure of non-exhaustiveness, the comparison is not usually particularly informative because the theoretical VAT figure is generally larger than actual VAT, indicating that the national accountants are more successful in estimating transactions incurring VAT than the taxation authorities are in collecting it.

- comparison of *theoretical income tax* (income available to households according to the national accounts) with *actual income tax* (tax collected by taxation authorities).

Comparisons with Norms

Comparisons with norms are a valuable tool in detecting and correcting for potential non-exhaustiveness. In particular, norms of intermediate consumption to gross output by activity are useful in checking for misreporting. For example, as described by Calzaroni (2000), the Italian Approach involves the adjustment of the outputs of entrepreneurs that fall below the norms for employees in small enterprises with the same activity.

Commodity Flow Methods

As noted in the NOE Handbook, the commodity flow method involves balancing total supplies and total uses of individual products. It is used to estimate the output of a commodity by balancing the supply and use of that commodity, using the following equation:

> output = the sum of all intermediate consumption, final consumption, changes (positive or negative) in inventories, gross fixed capital formation, acquisition less disposals of valuables, and exports minus imports.

This method is effective if a product is primarily used for one or a limited number of uses, and if accurate data on these uses are available. As output prices (basic or producers' prices) differ from the prices paid by purchasers, allowances should be made for the price differences when

output of a product is derived using the commodity flow method. The method may be useful for analysing the prices paid by final purchasers of a particular good, and the prices received by the producers, as well as for assessing the accuracy of distribution margins.

A specific application of a commodity flow method is to derive the output of retail trade from the supply of commodities. Often data on supply of commodities are compiled at a detailed level (usually separately for agricultural products, domestic manufacturing products, and imported goods). Information on shares of the product flows passing through retail trade, and on margin rates, are obtained from benchmark surveys, spot checks, and interviews. These data can then be combined with the data on supply of commodities to estimate the output of retail trade.

Special Surveys

Supplementary, special purpose surveys conducted by the national statistical office are another tool for assessing the exhaustiveness of the national accounts. They can take a variety of forms - surveys of expenditure, income, labour, time use, and opinion. They can be designed to target any of the exhaustiveness problem areas. However, especially for surveys focussed on sensitive subjects the results must be interpreted very carefully. For example, in surveys relating to hidden production, it is likely that the non-response is selective because people who are involved in tax evasion are more likely to refuse to co-operate than people who are not.

Surveys of expenditure on goods and services from underground production

Expenditure on underground production is a less sensitive topic than underground income. In the latter case the respondent is being asked to report on fraud whereas expenditure on underground production is usually not forbidden nor prosecutable. Indeed, the purchaser may well not know whether a seller is operating underground or not.

Kazemier and Van Eck (1992) provide an example of a survey on expenditure on underground production. The survey was on the subject of home maintenance and home repair and included questions on both underground labour and underground expenditure, i.e., expenditure on building materials without paying value added tax.

Surveys of labour input to underground production

In surveying the input of labour to underground production, there are two alternative approaches, namely surveying the *demand* and surveying the *supply*. Questions on demand are less sensitive than those on supply and can thus be expected to yield larger numbers.

Experiences suggest that, in an anonymous interview, many people are willing to admit part or all of their underground (but not illegal) production activities. However, surveying supply is prone to item non-response and incorrect response and so needs careful design. Kazemier and Van Eck (1992) show how a sequence of questions, that gradually lead to the key questions on underground activities, gives the best results.

Surveys of time use

Time use surveys are generally used to measure the time spent on activities like household work, do-it-yourself, neighbour help and voluntary work. However, they can also be used to identify non-exhaustiveness. In particular they can provide insight into the size and structure of household production for own use. Goldschmidt-Clermont and Pagnossin-Aligisakis (1995) give an example.

Special care must be taken in classification of the relevant activities. For a number of activities, additional questions are necessary. For example, it must be possible to distinguish between time spent on working as an employee in an enterprise and time spent as an own account worker. If respondents acknowledge that time is spent working on own account, they should be asked some additional questions to enable a classification of their work by branch and an estimate of the turnover and the amount of income earned. If the latter information cannot be obtained, questions on the living conditions and the wealth of the responding household, which can be part of the block containing general questions to classify the household, may provide an indication of the profits earned.

Similar information can be collected in a regular labour force survey. However, the advantage of the time use approach is that the questionnaires require respondents to account fully for their time. This improves the reliability of the results if everything else (geographic coverage, sample size, response rates, etc.) is equal.

Surveys of the informal sector and household production for own use

Surveys specifically designed to measure the informal sector or household production for own use can shed light on the extent of non-exhaustiveness in these problem areas. As with surveys of time use, they have to be carefully designed so that the results they provide can be blended with the results of other surveys in the sense that there is no overlap between them, or, if there is overlap, it is known. These surveys are discussed in detail in the NOE Handbook Chapters 10 and 11.

Qualitative surveys

Qualitative surveys of enterprises and of households can also provide information about non-observed activities. They have a number of advantages relative to quantitative surveys. They are quicker and easy to answer. They can be easily changed or supplemented to deal with new circumstances. They can also address questions regarding the causes as well as prevalence of non-observed activities. They can be addressed to very senior staff in surveys of large enterprises but are equally effective with very small enterprises. They can be designed to be less threatening than quantitative surveys by using questions referring to an industry or population group rather than the particular respondent. For example in place of asking a business respondent whether they accept "under the table" payments, the question can be phrased along the lines "What proportion of payments do you think are made in cash in your industry?"

Whilst qualitative surveys do not often lead directly to quantitative values that can be directly incorporated into national accounts estimates, they can provide impressions of the size of specific types of NOE activities. For example, approximate ratios of observed to concealed production can be obtained for each of the various branches of industry. They can also provide guidance in assigning priorities for subsequent more precise quantitative assessment.

The Russian Federation Centre for Economic Analysis (2000) describes opinion surveys of businesses in retail, construction and manufacturing conducted on an experimental basis in the Russian Federation. In a study of the underground economy as viewed by households, the Hungarian Central Statistical Office (1998) included some qualitative questions aimed at collecting citizens' views. Further details are provided in Chapter 8 of the NOE Handbook.

Use of Fiscal Data

As previously noted, income tax and VAT files are important sources of data for confrontation or compilation, although there are often problems in obtaining access to these data at individual record level.

Tax audit data also have a part to play. Quantitative surveys of tax evasion are unlikely to yield reliable results because of the delicate nature of the subject, even if anonymity is guaranteed. Tax audits by their very nature are more compelling than surveys. Enterprises are obliged to provide their complete accounts, not simply information derived from them. However, because they are designed for tax auditing not statistical purposes, tax audit samples have limitations for estimating non-exhaustiveness, typically including the following.

- the definitions used may not be consistent with SNA93;

- the audits do not detect all undeclared income, only what the auditors can find based on their examination of the accounts;

- the audits are usually clustered in certain activity sectors and/or geographic areas; and

- the audits are rarely selected on a probability basis.

Nevertheless, in the absence of better sources, tax audit samples can provide useful information on some types of non-observed activities, in particular those associated with underreporting. For example, according to Calzaroni and Madelin (2000) adjustment coefficients for output and value added are calculated by Institut national de la statistique et des études économiques (INSEE) in France using data from tax audits conducted by the French taxation authorities. The taxation authorities send the audit data without enterprise identification details to INSEE. The adjustment procedures vary according to the tax system applicable to the enterprise. The data are stratified by legal form, sector of activity, and size of enterprise. The statements of position before and after the audit and the reason for changes are examined. Only upward adjustments resulting from the concealment or omission of receipts are considered. Based on these data, adjustment coefficients are computed separately for corporate enterprises and unincorporated enterprises by sector.

In many countries, the output estimates for certain professional business services such as accounting and legal services, and for personal services such as private health practitioners' services, are made on the basis of average income per practitioner obtained from tax records, from market studies, or though consultations with a few practitioners.

Output Approach - Industry Specific Adjustment Methods

Section 5.3 of the NOE Handbook provides descriptions of adjustment methods in specific industries.

Expenditure Approach Adjustment Methods

Section 5.6 of the NOE Handbook provides descriptions of adjustment methods for the components of GDP compiled by the expenditure approach.

Upper Bound Estimation Methods

Section 4.3 of the NOE Handbook describes upper bound estimation methods, the essence of which is to derive an upper limit to the extent of non-observed activities. Such methods are particularly useful in dealing with suggestions that the national accounts figures are vastly understated. The NOE Handbook cites two particular examples:

- Broesterhuizen (1985) describes upper bound estimation (referred to in the paper as "sensitivity analysis") for underground production in the Netherlands using the production approach; and

- In Statistics Canada (1994) Gervais describes the procedures used by Statistics Canada in estimating an upper bound for the underground economy in Canada in 1992. In the second part of the paper, Gervais works systematically through all the components of GDP compiled by the expenditure approach.

Expert Judgement

When there are no data sources, as a last resort, identification and adjustment can be based on expert judgement. Even in this case, however, the means by which adjustments were made should be documented, i.e., how many and what types of experts were consulted and how their views were summarised.

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