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**Emerging conceptual issues in global production****Large and complex enterprises units [Chapter 6 of the draft  
Guide to Measuring Global Production]****Prepared by Task Force on Global Production***Summary*

The document is an extract from the draft “Guide to measuring global production”, presenting the results of the survey on large cases units (LCU) conducted in March 2013 by the Task Force on Global Production (TFGP). The purpose of the survey was to get a better understanding of the organization of work and the type of analyses carried out by LCUs. The results are presented in chapter 6 of the above mentioned Guide. This document provides a brief background, considers the reasoning behind the consistency work and focuses then on the outcomes of the survey. It concludes by giving some recommendations for dealing with large and complex enterprises based on good country practices.

Currently the Guide is sent for consultation with the Conference of European Statisticians (CES) member countries with view of presenting it for adoption to the CES Plenary in June 2015.



## I. Introduction

1. The Globalization Guide, in 2011, concluded that the activities of large multinational enterprises (MNEs) should be examined case by case, in close cooperation with statisticians working in relevant statistical domains such as national accounts, industry and services statistics, balance of payments (BOP), prices etc. Some national statistical institutes (NSIs) have established organizational units to examine MNEs and other statistical units that are important for the quality and consistency of statistics.

2. Consistency analysis, used in many NSIs, is a practical tool for quality assurance. It includes collecting data from different sources and comparing them in a systematic way. Consistency means that data from different statistics fit together and provide a coherent description of economic development.

3. Organizational units, responsible for consistency analysis of MNEs in particular, are called here large and complex enterprises units (LCU). The work done by LCUs is crucial for ensuring that the data of large corporations is incorporated coherently across economic statistics. The above mentioned Globalization Guide presented case studies of LCU work in Finland, Ireland, Netherlands and Sweden as Annexes of Chapter 2.

4. This chapter focuses on presenting the outcomes of a survey carried out by the TFGP to get a better understanding of the organization of work and the type of analyses carried out by LCUs. The results of this survey will provide statistical offices with a possibility to identify best practices across countries. Some of the initial results were discussed at the meeting of the Group of Experts on National Accounts in April 2013.

5. The survey was sent to 14 countries where consistency work had already started. The survey questionnaire is attached as an Annex to this chapter. In total, 10 countries replied: Canada, Czech Republic, Finland, France, Hungary, Ireland, Netherlands, New Zealand, Norway and Sweden. Czech Republic and Norway replied that they do not have an LCU. New Zealand also reported not having a dedicated LCU, but provided a summary of their work related to surveying and dealing with large and complex enterprises which is distributed across the organisation. Their Integrated Data Collection (IDC) unit conducts relationship management and ensures supply of data from large units, but does not currently contribute to data analysis or consistency work. However, since this practice is in many ways similar to those of LCUs, for simplicity the work carried out in New Zealand is reported together with the countries that have established an LCU.

6. This chapter first provides a brief background and considers the reasoning behind the consistency work. Section III presents the results of the survey, including a discussion of the organisational aspects, human resources, use of different data sources, selecting the target population and managing respondent relationships. The section then continues by considering the challenges of data reporting, data linkage and data exchange and the process of solving inconsistency issues. It also touches briefly on issues other than globalization that cause data inconsistencies since these are part of the focus of the LCUs. These other issues include the use of different statistical units and definitions, and differences in data processing across statistical domains which may lead to an incomplete or inconsistent description of the economy. The chapter also presents how LCUs examine the different cases of global production arrangements according to the typology presented in Chapter 2 of the draft Guide to Measuring Global Production. The chapter concludes by highlighting some important country comments and giving recommendations for dealing with large and complex enterprises in Section IV.

## II. Background

7. The impact of MNEs on national accounts and balance of payments statistics is substantial. Almost all business and economic surveys are affected in some way by the activities of MNEs. This is especially true for open and globalized economies where the importance of international trade is large, and where a relatively small number of MNEs accounts for a major part of total output and value added of national economies. For this reason, MNEs are generally included in most surveys carried out in the area of economic statistics.

8. For example, in Sweden the 50 largest enterprises accounted for almost 30 per cent of non-financial enterprises' contribution to GDP in 2005 (see Eriksson, 2008). Data on the largest enterprises is, thus, critical for improving the quality of economic statistics. That is why LCUs concentrate mostly on MNEs. For instance, in Ireland all LCU client enterprises are MNEs and in the Netherlands at least 90% of the 320 enterprise groups that the LCU deals with are MNEs or part of an MNE. LCU work covers, in the Netherlands, some 40% of turnover, 35% of value added and 20% of the number of persons employed of all non-financial enterprise groups.

9. International tax considerations are very important for MNEs and may change the way MNEs organize their activities. Sometimes, although physically nothing changes in the production of goods, the way the company reports on its activities may change and the change may influence statistics.

10. One of the challenges, faced by statisticians, is that enterprises often do not account for their financial performance by physical establishment or by production unit. Consequently it is quite a challenge to collect data from MNEs on a country by country basis, not to mention by establishments within a country. Enterprises may account for their financial performance in ways that fit with their own requirements, such as geographical or functional divisions, type of good/service or customer groups. In general terms the economy has evolved to being more knowledge-based, where outsourcing and offshoring expand the supply chains to new markets with the aim of making MNEs more cost effective. Thus, while the business world has evolved, the requirements for statistical data collection have not really changed. (Vinette 2008)

11. In view of these developments, already in the early 1990's many NSIs started considering how to counter the difficulties experienced in compiling national accounts, especially in measuring the activities of MNEs. This work took many different shapes: dedicated contact persons to provide large enterprises with a single contact point inside the NSI for all surveys; networks of specialists and working groups within the NSI or the statistical system to discuss and analyse the data and the related inconsistencies; persons nominated as MNE coordinators; or separate units to conduct consistency analysis and guide data collection and editing in the NSI.

12. Several NSIs have realised that a more proactive dialogue with important respondents can improve the large enterprises' understanding of the statistical data requirements. A study conducted for the United States Census Bureau identified the following areas for improvement in respondent relationships (Marske, Torene and Hartz 2007):

- It is difficult to keep track of frequent company reorganizations and changes of contact information across multiple survey programs.
- Businesses place statistical surveys after other reporting responsibilities such as internal and stockholder financial reports, and tax and regulatory agency reports.

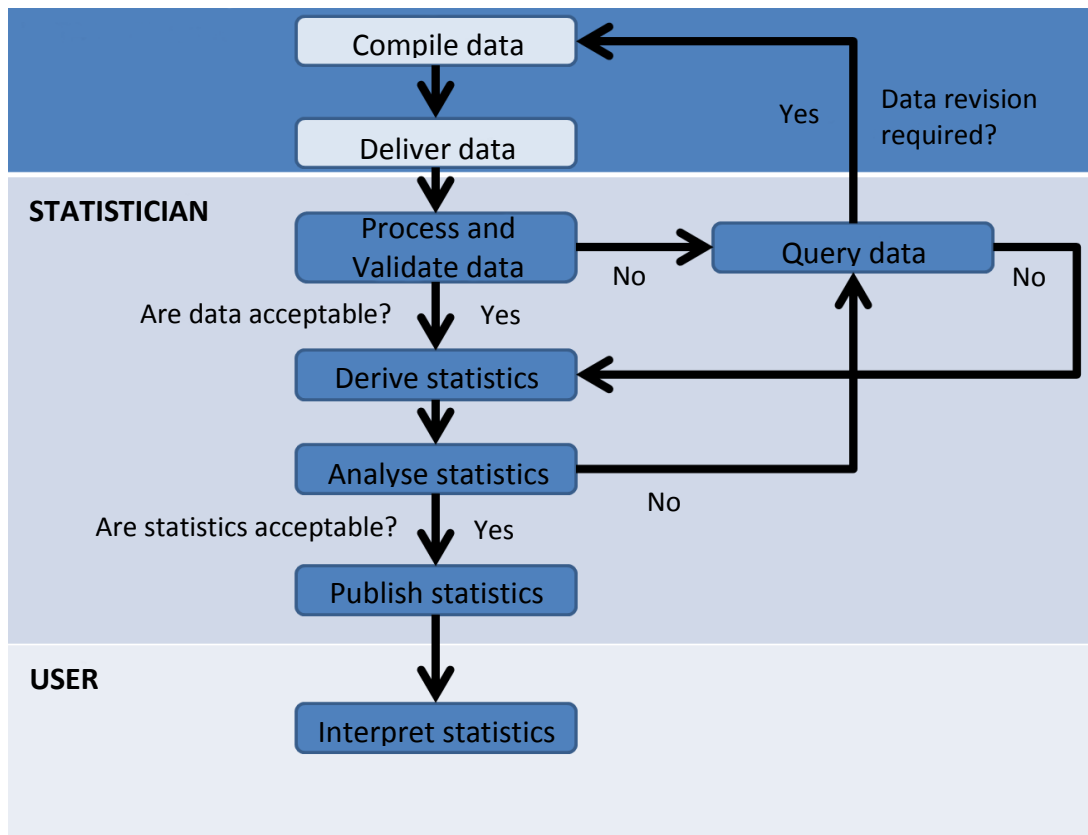
- Enterprise respondents would like to receive more information about the survey, including advance notice of the survey and real time responses.
- Many enterprises would prefer having a single point of contact at the NSI and in the enterprise to streamline communication.
- Respondents are unaware of how survey results are used in the statistical system.

13. In addition, according to feedback from respondents some statistical concepts should be better explained in data collection forms, and the NSIs' data collection strategy should be fine-tuned especially for large and complex enterprises.

14. The process of supplying data to NSIs is complex (see Figure 1) and can be costly for respondents in terms of staff time and required system changes. Because respondents have an incentive to minimise the time and resources spent fulfilling data requests, NSIs should try to make respondents' work easier. Providing good support to the important respondents can reduce the need to do additional data queries and ensure that high quality data are delivered in the first instance. Ways to minimise response burden and misunderstandings include regular contacts between the NSI and the respondent, involving respondents in the design and testing of new surveys, getting to know more about the respondent's business, communicating data requirements concisely and clearly, allowing for the possibility of customised data supply and providing timely support to the respondent. These tasks are often assigned to LCUs, and as these measures have been taken many respondents have reported a sense of decreased response burden.

Figure 1

**Interaction between data providers (respondents) and statisticians in statistical production**



Source: Reserve Bank of New Zealand

**DATA PROVIDER**

15. The main tasks of LCUs are to manage the relationships with the key providers of data, i.e. the large and complex enterprises, to achieve better coherence and quality of data. The aim is to provide a coherent description of the economy by concentrating efforts on the data of the most complex and largest respondents.

16. Providing effective support to respondents is not costless. It not only requires more external cooperation with the respondents but also increased collaborative work among different subject matter experts in the NSI. Although in principle the same services should be available to all respondents at request, the NSIs cannot invest the same amount of time to supporting all of them. The investment of staff time needs to be prioritized to those respondents that experience biggest challenges in providing data and to those that have a most significant impact on the quality of statistics.

17. While the problems related to globalization are a driving factor for consistency work, inconsistency may also arise due to other reasons. The LCUs, therefore, typically pay attention to differences in statistical units and definitions applied across statistical domains, and to unnecessary deviation from common tools and methods in data processing.

### **III. Operation of the large and complex enterprises units**

18. The following subsections focus on the findings of the survey. They generally follow the structure of the questionnaire (see Annex), which included five groups of questions covering organizational aspects, data sources, operational aspects, the typology of global production arrangements, and specific country experiences. In certain instances additional detail is introduced to highlight specific themes, such as human resources or respondent relations. Each subsection below starts with a paragraph referring to the survey questions covered.

19. As the survey was sent to some countries only, it does not give a complete understanding of LCU activities in the NSIs around the world. This is why more focus has been put on describing the actual practices rather than reporting the numeric country responses. In several cases, countries' replies were not strictly comparable in terms of the scale or units in which they provided information. Yet, some illustrative charts and tables have been used where possible.

#### **A. Organizational aspects**

##### **1. Organizational arrangements**

20. The survey explored the kind of arrangements statistical offices have made (or are planning to make) to deal with large and complex enterprises (Question (Q) 1.1). It asked countries to report about any dedicated LCUs that they have created, and where their activities are located in the organizational chart (Q 1.2).

21. Seven out of eight countries that replied to the survey have created an organizational unit to deal with large and complex enterprises. In Canada, France, Hungary and the Netherlands LCUs are independent units located together with business statistics and in Finland the unit is located with the business register. Ireland has placed their LCU directly with national accounts. Similarly, national accounts are actually in the same department with the LCU and business statistics in Canada, France and the Netherlands. The LCU is part of a department for centralized data collection in Sweden. In New Zealand the integrated data collection unit carries out tasks in respondent relationship management and ensuring supply of data from large units, while other LCU-type work is distributed throughout the organisation.

22. Organizing consistency work in the form of LCUs has certain advantages, for instance:

- (a) Complex enterprises become clearly a focus and responsibility of the LCU, which may allow for having a single contact point and greater flexibility in data provision for the respondent.
- (b) Data from the different surveys are accessed and compared across statistics at an early stage.
- (c) Data issues can be discussed among statisticians, and once agreed, can be solved in a consistent way across statistics.
- (d) Individual statisticians know whom to contact when experiencing challenges with large and complex enterprises.
- (e) Greater critical mass of specialist skills and expertise becomes available in the NSI.
- (f) Possibility to standardise the design and development of data collection functions across the organisation and thus create efficiencies.

23. All countries recognised efficient cooperation and communication within the NSI and with respondents as an important element of successful consistency work. Instead of creating a specific unit, some NSIs have created a working group or a network of experts comprising staff from several departments of the NSI, regional offices and other producers of official statistics. Quite often, this kind of an arrangement may also complement the LCU work. For example in addition to the LCU, Hungary set up a network of experts that includes a representative of each of its seven regional offices and two working groups. One working group consists of experts from business statistics, national accounts and external trade statistics, and the other of experts of the NSI and the central bank.

24. In the survey, most NSIs called for exchange of experience on organizing LCU work. In this regard, the European Statistical System network (ESSnet) on Profiling has been very useful. The ESSnet on Profiling focuses on globalization in the analysis of complex and large enterprises, and aims to provide a better understanding of globalization and global production chains. The confidentiality rules of the EuroGroups Register (EGR) allow data sharing among the members of the ESSnet. Otherwise, in most countries legislation restricts data sharing even with other producers of official statistics both nationally and internationally. This unfortunately limits the opportunities to collaborate on the analysis of large and complex enterprises.

25. The differences across countries in consistency work are partly explained by the way statistical production is organized. For example, balance of payments and merchandise trade statistics are not always compiled by the NSI. These statistics are especially important for the consistent treatment of globalization and MNEs' activities. Thus, good cooperation between the NSI, providers of administrative data, such as tax authorities, and with the other producers of statistics, for example the central bank and customs office, is crucial for data quality and consistency. In some countries this cooperation is based on ad-hoc contacts, whereas others organise regular meetings. Restrictions of data exchange among producers of official statistics cause challenges nationally, and in these cases cooperation is limited to macro level issues.

## **2. Human resources**

26. The survey asked for an estimate of working time (in full time equivalent units) annually spent in the LCUs on dealing with large and complex enterprises. For comparison, the same estimate was asked for the entire statistical institute (Q 1.3). The NSIs were

requested to allocate the LCU labour capacity to different activities, such as surveying, data analysis (imputations, data adjustments), profiling of enterprises, company visits, coordination or other activities (Q 1.6). NSIs also provided information on the required staff skills and competencies (Q 1.4), and whether they consult experts from outside the NSI such as from central banks or tax authorities (Q 1.5).

27. Among the respondents, the average size of the LCUs was between 0.2-0.4 per cent of the total staff of the NSI. In Finland and Hungary the resources allocated to LCUs are about 4-5 staff years in full time equivalent units (FTEs). A similar amount is used in LCU type of work in New Zealand. Two countries, the Netherlands and Sweden have created somewhat larger units in relative terms: 1.5 per cent (30 FTEs) and 0.7 per cent (10 FTEs) respectively. Canada has allocated 18 FTEs to their LCU, France 12 FTEs and Ireland 10 FTEs.

28. The amount of time spent dealing with large and complex enterprises, in reality is larger than what is reported in this survey. Plenty of time is invested in this work also in the statistical production units, but is usually not measured.

29. The tasks of LCUs vary across countries, but the following are most often identified:

(a) **Surveying** and monitoring the data collection process to identify current and forthcoming problems in data provision. Participating in drafting instructions for respondents and developing common and/or tailored tools for surveying.

(b) **Data analysis** (imputations, data adjustments) to solve problems related to large and complex enterprises arising in statistical production. The aim is to improve coherence and reduce the need for ad-hoc data editing in the longer term.

(c) **Profiling enterprises** is defined in the “Business Registers – Recommendation Manual” (Eurostat, 2010) as “a method to analyse the legal, operational and accounting structure of an enterprise group at national and world level in order to establish the statistical units within that group and their links, and the most efficient structures for the collection of statistical data”. Profiling helps to achieve consistency over statistical domains and to collect more relevant data for the business register and other statistics through economically meaningful units instead of artificially created administrative business units.

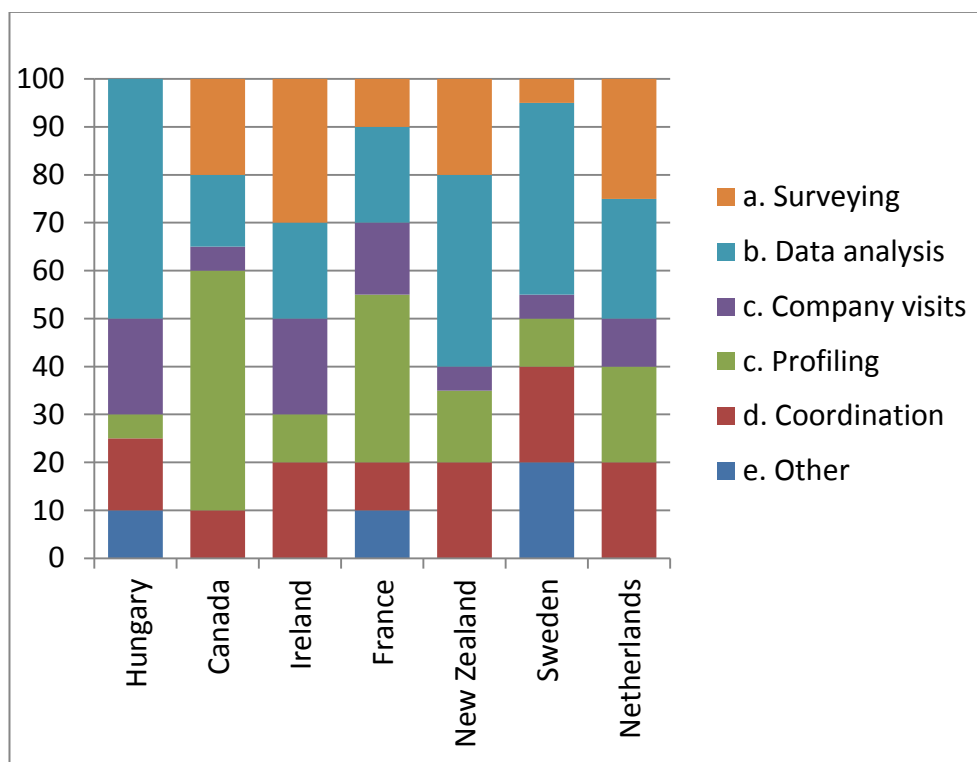
(d) **Coordination** involves providing a contact point between the statistical office and the respondent. The coordination task is two-fold involving both communication of the statistical needs to the enterprise, and harnessing expertise and providing learning opportunities within the office about changes in the enterprise and their treatment. **Visiting companies** is a way to establish a dialogue and build relationships with large respondents. The significance of the enterprises’ data for statistics is typically explained during company visits. This enables better understanding of the data requests and personalises the process. Knowing the enterprise, its business and organisation better, and being updated on changes in the enterprise helps to solve data problems more efficiently. Knowledge of the enterprises’ accounting systems, administration and their capacity to provide data may be helpful as well.

(e) Other tasks include for example **development of standards** and tools which can create efficiencies and help to improve consistency. This task requires continued re-evaluation of the statistical production process where the LCU can best contribute to the quality of statistics.

30. An analysis of the labour capacity dedicated to different activities of LCUs shows that they are quite different across countries. In some NSIs the LCU is not very involved in surveying while in others the share of time used in this task is 20-30 per cent. Time used in data analysis (including coherence analysis) varies from 15 to 50 per cent. Profiling is also

a key activity, for example in Canada where it takes up to 50 per cent of the LCU working time. Yet, the average time used in profiling in the other countries is about 15 per cent. Visiting enterprises takes 5-20 per cent of the working time, and coordination of work around 10-20 per cent. On average, most of the time is allocated to coordination, data analysis and profiling. (See Figure 2)

Figure 2

**Allocation of labour capacity dedicated to LCU activities**

31. Some NSIs focus on respondent relationship management and the steady supply of the requested data. They plan to extend the work more towards profiling and maintaining consistent data through the EuroGroups Register. In New Zealand, the LCU work is currently mainly focused on respondent relationships, but will engage more substantially in business profiling and data quality checking in the future.

32. Successful operation of LCUs requires a good combination of specific skills and competencies. Countries listed the following as important skills for the LCU staff:

- Good **communication** and interpersonal skills for dealing with the representatives of large businesses.
- Proper knowledge of **accounting** and business economics with insights into how and why MNE groups organize their operations.
- **Understanding of economic statistics and surveys**, for instance, how the collected information fits together and is used in statistical production throughout the organization. Broad experience in economic statistics would provide such understanding.



- **Subject matter expertise on particular industries**, commodities and services produced.
- Good **analytical skills** for making conclusions on the data.
- **Solid technical skills** for data mining and using different tools and software for combining data from various databases.

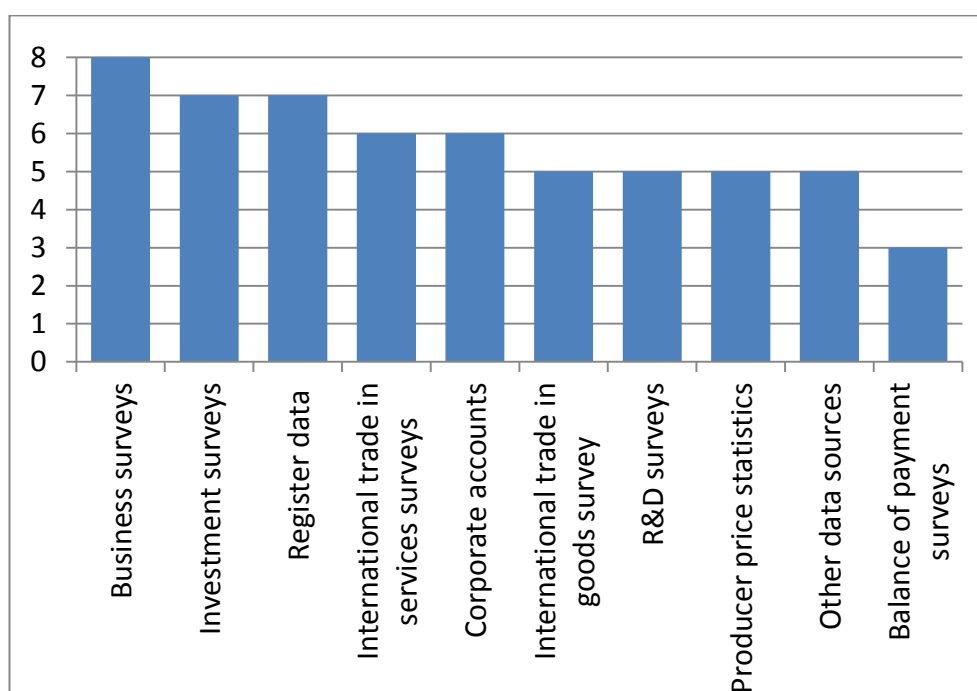
## B. Coverage of data sources

33. The survey requested that the countries sum up the various statistics that are subject to examinations of large and complex enterprises (Q 2.1), and asked to specify what kind of registers were used as data sources (Q 2.1.h). The frequency of analysing the different data sources was also explored (Q 2.2).

34. Various statistics are used as a source of data to examine large and complex enterprises (see Figure 3). All countries that responded to the survey reported using business surveys for consistency analysis. In addition, all except one country rely on register data and investment surveys. Register data used includes the business register, enterprise groups register, EuroGroups register, different tax registers and customs registers.

Figure 3

### Statistics subject to examinations of large and complex enterprises



35. The enterprise group register and the EuroGroups register are often an integrated part of the business register. The structures of enterprise groups they record are a very useful source of information for the LCU work.

36. Most of the countries also analyse data on international trade in services and corporate accounts. Five countries reported using the survey of international trade in goods, the research and development (R&D) surveys and producer price statistics.

37. Use of data from the balance of payments surveys was mentioned by three countries only. This probably reflects the fact that the balance of payments is often compiled by the central bank. NSIs typically use the data they collect themselves or the register data sets they have in their possession.

38. Five countries mentioned using other data sources for consistency work. These included business outlook, statistics on the production of manufactured goods (PRODCOM), specific surveys such as Information and Communication Technology (ICT) surveys, enterprises' quarterly and annual reports and balance sheets of enterprise groups. Furthermore, New Zealand explained that the structure of their business demographics, where large units dominate many industries, mean that large and complex enterprises are significant in all surveys and statistics. In Canada, the LCU is focused on business surveys and tax data, but may examine other data sources on an ad-hoc basis. France plans to include data on international trade and foreign affiliates statistics (FATS) in the analysis.

39. The LCU staff analyses these data sources usually on a quarterly and annual basis depending on the frequency of the data in each data source. Two countries also analyse short-term statistics on a monthly basis. More careful analysis is usually carried out annually when all relevant datasets become available. France also benchmarks monthly and quarterly data on large and complex enterprises with annual statistics.

## **C. Operational aspects**

### **1. Population of large and complex enterprises**

40. The population of large and complex enterprises (or enterprise groups) is typically determined and maintained according to certain criteria. The survey explored how the target population of the LCU is defined (Q 3.1.a) and how many enterprises and enterprise groups are included (Q 3.1.b). Countries were asked to evaluate how important measurement problems related to globalization were taken into consideration when deciding whether or not an entity should be included in the LCU group (Q3.1.c).

41. The LCU aims to target the most important and the most challenging respondents that may have a serious impact on the quality of national accounts and other statistics.

42. The criteria for identifying large and complex entities comprise the following:

- Size is measured by some of the following variables: gross value added, turnover, annual income, value of production, balance sheet total and/or number of employees.
- Complexity is assessed by the number of layers in the enterprise group structure, number of enterprises in the group, and complexity of operations by industry or geographical area.
- Significance for data collection means selecting the most important respondents among businesses i.e. those who have problems in data provision, to whom a large number of questionnaires is sent, whose response performance needs improvement or whose enterprise group is very dominant in a certain industry.

43. Some countries mention using profiling programmes or algorithms to calculate a "complexity and size score" based on a combination of the parameters listed above. For example, Canada ranks enterprises on the business register based on the size of the enterprise in terms of revenues generated and the complexity of the enterprise in terms of its operations by industry and by geography.

44. Usually the final list of enterprises is agreed based on both data analysis and discussions with the subject matter units and the LCU. Often enterprise groups are added at the request of national accounts or business statistics departments, because they cause challenges in statistical production. Statistical departments are also asked to identify any significant reporting issues for selecting enterprises to be included in the LCU's work programme.

45. NSIs update the list of large and complex enterprises with varying frequencies: from quarterly updates to a timeframe of a couple of years.

46. The number of enterprises or enterprise groups handled by LCUs depends on the size of the economy and on the share of value added created by the rather small number of largest enterprise groups. The number of enterprise groups handled by LCUs varies across countries from 15 to more than 320 (see Table 1).

Table 1

**Target populations of LCU work**

	<i>enterprises*</i>	<i>enterprise groups</i>
Hungary	1000	
Canada	320	
Finland	350	15
Ireland		70
France		100
New Zealand	1800	110
Sweden	2000	50
Netherlands	2400	320
Average	1312	111

\* domestic enterprises

47. Often the largest and most complex enterprises are analysed more intensively, whereas other enterprises can be analysed more or less automatically. For instance, France profiles intensively around 100 large and complex enterprise groups. The medium-sized groups are profiled lightly (consisting of about 2000 units) and small groups automatically (about 40 000 units).

48. Countries report that challenges related to globalization are a high priority when determining the target population of large and complex enterprises. What matters for the selection phase is the complexity of the enterprise, not what is causing it, but often the most complex cases belong to multinational enterprises. The LCU work usually focuses on the domestic enterprises. In some cases the units abroad have to be taken into account as well. Sometimes the objective of the work is to get a good understanding of the production process of an enterprise group, rather than mapping all its global production structures.

## 2. Respondent relationships

49. The NSIs were asked if, in their view, company representatives consider centralized surveying and having one contact person in the enterprise feasible and desirable (Q 3.2.a). It was also inquired if customized survey forms or survey methods are used for large and complex enterprises (Q 3.2.b), and how the respondents are consulted in setting up these customized surveys (Q 3.2.c). Finally, the NSIs were asked if electronic surveying methods are used, for example based on extended mark-up language (XML) or extended business reporting language (XBRL) (Q 3.2.d).

50. One argument in favour of respondent relationship management by LCUs is the possible decrease of response burden. Having only one contact person at the NSI who knows all the surveys sent to the enterprise makes the work easier for the respondent and is expected to increase the quality of data received by the NSI. For this reason in Ireland the LCU became, among its other tasks, a “one stop shop” for MNEs in all their dealings with the NSI.

51. Similarly, directing all surveys to one focal point in the enterprise may release time and attention of other staff. The usefulness of having only one contact person depends among other things on the structure of the internal reporting system of the enterprise and on the way they have organized their data management. For issues related to respondent relationships, the enterprises normally appoint one dedicated contact point. Current country experience shows, however, that often enterprises direct different questionnaires to different persons. Nevertheless, it seems that the majority of large enterprises would prefer that statistical information be managed by one central contact at the NSI. At the moment, NSIs mainly offer a single contact point only if a specific arrangement has been made with the enterprise or the enterprise group in question.

52. Usually, the contact person at the respondent’s end needs several dedicated persons in different departments as “subcontractors” in data provision. Currently, only in rare cases the NSI sends all surveys to one contact person at the enterprise group who then distributes them within the group. Some enterprises prefer centralization by theme, for example to direct all surveys regarding human resources and administration to one person. In Finland a special procedure has been defined to assure confidentiality of enterprise level data when an enterprise group has a single contact point at the NSI. A special agreement will be signed between an enterprise group and Statistics Finland which details the information that this single contact person is allowed to see.

53. It seems that tailored questionnaires are quite rarely developed for MNEs. Canada, New Zealand and Sweden mention that a customized reporting form may be developed for some enterprises only if deemed useful during negotiations with them.

54. A couple of interesting examples of respondent centric data collection forms were reported:

- Ireland issues three electronic forms - monthly, quarterly and annual. The forms are tested with the enterprises. The forms cover all the variables required from the respondent at each frequency and thus eliminate duplication of surveying.
- In France each profiled enterprise group may receive a tailored structural business statistics survey form. To get started, though, they need to experimentally fill in the tailored survey for the duration of one year, while their legal units still answer to the regular survey forms separately.

55. Some other NSIs also reported in the survey on their willingness to provide customized questionnaires, but so far practical limitations have prevented wider application of tailor-made approaches.

56. Countries reported that customized forms should always be developed in close cooperation with the respondent and different experts in the enterprise, including consultations with subject matter personnel at the NSI. This usually requires organizing a visit to the enterprise for finalizing the questionnaires, and testing of data collection forms before use.

57. Electronic data reporting provides a good platform for customizing questionnaires. Several countries have developed or are currently introducing electronic tools for data reporting. They vary from questionnaires based on excel sheets to more complicated XML-

based web applications. So far, no country is using XBRL, but some experimenting is ongoing on behalf of Eurostat.

### 3. Conceptual challenges of data reporting

58. The survey explored the role of LCU activities in improving data quality. NSIs reported if they believe that respondents generally understand the concepts of “domestic economy”, “residency” and “economic ownership”, and how these concepts may relate to the information available at the corporate level (Q 3.3). The countries were asked: Which data sources are used when measuring for example industrial processing, merchanting, economic ownership of goods, inventories or assets held abroad? How do they overcome the conceptual differences between international trade in goods and national accounts? (Q 3.4) Does their analysis also include R&D: production, capital formation and international trade? (Q 3.5)

59. Some of the concepts used in data collection are complex and the related data may be difficult to collect. As MNEs are often engaged in merchanting and processing as part of global value chains, their activities constitute at least the following challenges for statisticians:

- Distinguishing between activities that are resident and non-resident in a particular economy.
- Detecting and recording merchanting activities where the actual goods do not cross the compiler’s frontier.
- Detecting movements of goods for processing abroad to be excluded from international trade in goods statistics because there has been no change of ownership.

60. Generally, the respondents understand the main concepts used in statistical data collection quite well. However, often there is a need to align the concepts to the language of the enterprises and business accountants. Data quality can improve if NSIs explain how the concepts fit the enterprise in question and its activities and characteristics. Regardless of good documentation, there may be cases where the availability of information at the enterprise according to the desired statistical breakdown is simply restricted due to the limits of the enterprise’s internal reporting system.

61. Misunderstandings originating in data collection may lead to poor quality and consistency of statistics. To avoid misunderstanding of important concepts, efforts should be put into drafting clear and concise definitions for variables including practical examples to be given in the instructions that accompany questionnaires. Furthermore, statisticians choosing the concepts and carrying out surveys should study what kinds of data are available at the corporate level.

62. Activities such as industrial processing and merchanting are among the special measurement challenges that LCUs need to tackle. The main source for detecting these activities is confrontation of data from structural business statistics, surveys on international trade in goods and services, PRODCOM, the monthly survey on turnover for manufacturing and value added tax (VAT) data.

63. For instance, since 2008, the French structural business statistics survey differentiates between five types of sourcing in manufacturing:

- (a) Products bought or processed by a sub-contractor supplying the inputs;
- (b) Own products processed by a contractor on material supplied by the surveyed business;

- (c) Products produced in own factories based on own concept;
- (d) Products produced in own factories not based on own concept;
- (e) Products processed as a sub-contractor (manufacturing service).

64. This breakdown does not yet split between domestic and foreign processing, but the possibility to do so is currently studied. France also reported about the risk that data on the legal unit level. These data are no longer used by the management of enterprises. Instead they are purely administrative and fiscal. For this reason, they become available later and are therefore less significant from an economic point of view.

65. As discussed in Chapter 3 of the draft Guide, the concept of ownership used in the International Financial Reporting Standards (IFRS) and the United States Generally Accepted Accounting Principles (US GAAP) that guide accounting practices in enterprises has many similarities with the concept of economic ownership in the System of National Accounts (SNA). Yet, it is among the concepts that are difficult to understand and apply in practice, similarly to the concept of residency. More and more often global organisations do not need to measure “domestic” production for reasons other than to fulfil the needs of official statistics.

66. There are conceptual differences in the treatment of the change of ownership principle between merchandise trade statistics and national accounts that cause difficulties in statistical production. Some NSIs are carrying out research to bridge between the two data sets. Analysis of data from different surveys is important in order to link merchandise trade and production statistics to the national accounts. LCUs can help to identify and solve any significant or unintended conceptual differences between these statistics.

67. Another difficulty is the lack of data sources for measuring economic ownership of goods, inventories or assets held abroad. One country reports using survey data for this purpose, and one reviews quarterly and annual company reports for the related information. Additional surveying may be needed in the future to get more information on these MNEs’ activities.

68. The survey shows that analysis of large and complex enterprises does not generally extend to data on R&D production, R&D capital formation and international trade. LCUs seem to deal with R&D questions to a limited extent. They assess royalty flows and business expenditure on R&D only in few countries. The Netherlands explains that the comparison of the R&D data from the annual production statistics with the data of the R&D survey is difficult for two reasons:

(a) In the production survey only the costs of R&D by third parties are included, so the possibilities to confront data from different sources are very limited.

(b) The R&D survey is based on cash flows expenditures, whereas the production survey measures expenses recorded on an accrual basis. Therefore, these two recording concepts do not necessarily provide matching information.

#### **4. Data linkage and exchange**

69. The survey examined whether NSIs are able to link unit level data from international trade surveys and business surveys (Q 3.6). It also reviewed cooperation with other NSIs in examining the activities of MNEs. In this context, the survey also asked whether a legal framework is in place for regulating (or preventing) data sharing or data linking. (Q 3.7)

70. In general terms, MNEs complete a considerable number of statistical questionnaires since they tend to be large and have a significant impact on several statistics. For this reason they are typically included in most surveys that cover economic and business activities. Consequently, an MNE completes various surveys that are transmitted to

different statistical domains in the NSI such as industry, services, producer prices, international trade and balance of payments.

71. Often the activities of the MNE need to be aggregated in statistical production based on data reported by different units of the MNE. It is therefore critical for consistency how their data are treated across statistics, not only data on merchanting and processing but also on production, turnover, imports and exports etc.

72. In most countries that responded to the survey the LCU link unit level data across statistics, including with trade surveys, although in some countries this is not done regularly. Unfortunately, some NSIs cannot link survey data with register data due to the lack of a common identification (ID) code. One NSI reported that, regardless of having a common ID code for enterprises, linking has not helped solve the large differences that remain at the macro level. The NSI of France, on its part, is working towards an agreement with the central bank on linking the balance of payments micro-data on international trade in services with other business surveys.

73. Half of the countries reported that they exchange data internationally among NSIs on an ad-hoc basis only, mostly this has been done within the ESSnet on Profiling. Besides ESSnet on Profiling, data exchange is done within the ESSnet on Global Value Chains. NSIs of Norway, Denmark and Finland exchange unit level data as part of a mirror exercise of inward and outward FATS data. One country also reported that mirror data are sometimes exchanged among NSIs on external trade statistics, in the framework of the project on the Modernisation of European Enterprise and Trade Statistics (MEETS).

74. The legal framework, usually the statistical law, typically limits or prevents data sharing even among producers of official statistics. This may not be the case in all countries. Some European Commission (EC) regulations facilitate data exchange, such as EC No 177/2008 establishing a common framework for business registers for statistical purposes. The regulation states that “the exchange of confidential data may take place, exclusively for statistical purposes, between the appropriate national authorities of different Member States, in accordance with national legislation”.

## 5. Solving data consistency issues

75. Countries were asked how they solve inconsistencies encountered in source statistics, national accounts and balance of payments. They were also invited to consider any timeliness or continuity issues that need to be addressed in this respect. (Q 3.8)

76. The process launched to solve inconsistencies varies across countries:

- Initiative by the subject matter department: In this case, the unit responsible for the survey carries out data editing. If there are problematic cases, they contact LCU staff. LCU decides how to solve the problems that concern several statistics.
- Initiative by LCU: By comparing different sources LCU detects inconsistencies, and then contacts subject matter areas.
- Shared work with LCU: Data confrontation is done both by LCU and the national accounts department.
- Regular working group meetings: A working group of experts from various statistics meets before quarterly publications. Problems are solved case by case as they arise.
- Ad-hoc meetings: LCU calls a meeting of experts of various basic statistics and national accountants to solve inconsistencies if needed.
- Contacts to respondents: Large enterprise coordinators contact the enterprise to discuss the inconsistencies and solve the issues related to data reporting.

77. In Ireland service level agreements exist between the statistical domains and the LCU. The agreements cover issues related to timeliness, data quality of aggregates supplied by LCU to the statistical domain for integration into their own statistical products, etc. Editing of the data is done by the LCU in Ireland for all the MNE groups covered by the unit.

78. Some countries do not have enough time to detect and solve effectively the inconsistencies of monthly statistics, such as international trade in goods. Regardless of LCU's efforts, typically all inconsistencies cannot be solved before publishing quarterly statistics.

79. Continuity problems may occur when short-term statistics have to be adjusted because of a consistency correction. Since the main aim of short-term statistics is to measure changes across time and not levels or structures, corrections for structural correctness may not be necessary in short-term statistics. Instead, maintaining comparability in time requires a lot of efforts while producing short-term statistics. Therefore, important inconsistency problems in monthly statistics require timely work by LCUs.

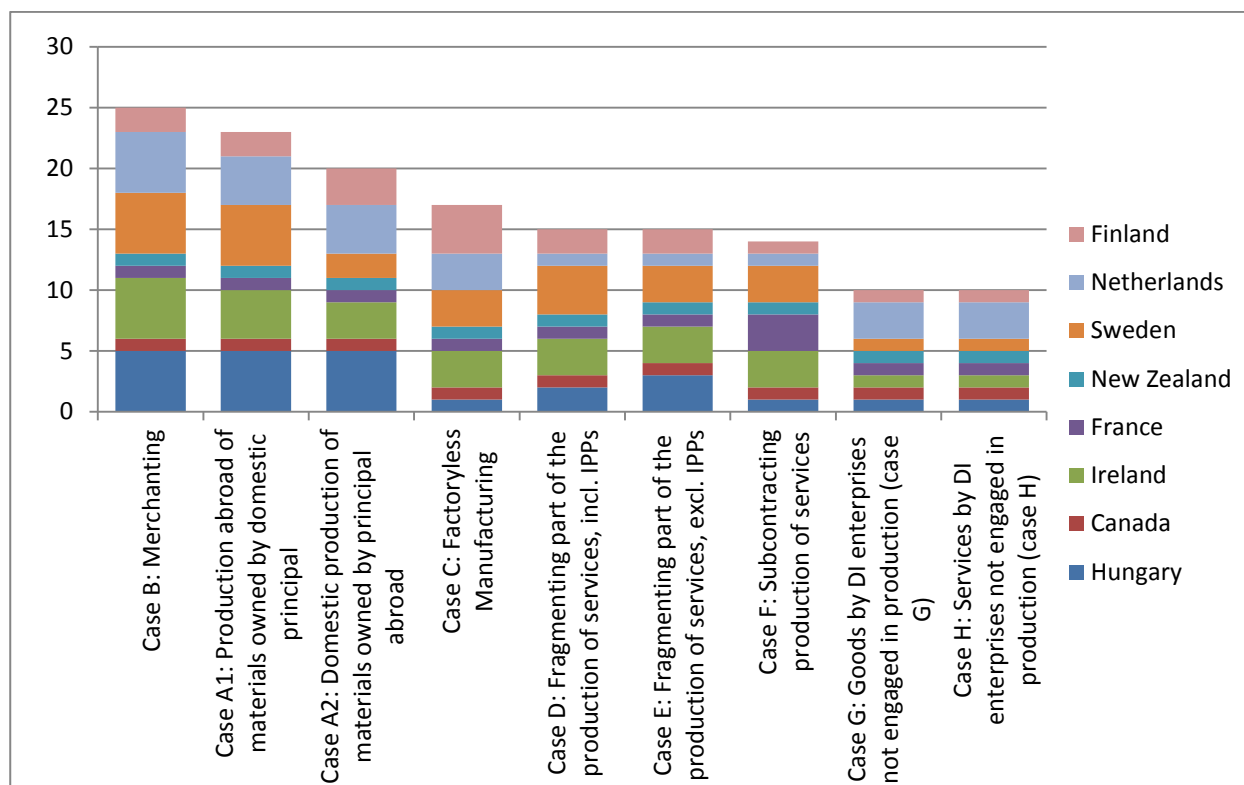
## **D. Typology**

80. The survey explored which 'standard' cases of global production, as introduced in Chapter 2 of the draft Guide to Measuring Global Production, are most frequently examined (Q 4.1). The countries were also asked to describe any additional cases they have encountered that do not fall under the 'standard' types presented in the typology (Q 4.2).

81. Countries were requested to report on how often they examine different cases of the typology of global production using a scale from 1 (hardly examined) to 5 (very often examined). Most frequently NSIs analyse cases of global production that relate to merchanting (Case B) (see Figure 4), followed by production abroad of materials owned by domestic principal (Case A1) and domestic production of materials owned by principal abroad (Case A2). Finland, Ireland, Netherlands and Sweden encounter most often cases of factoryless production (Case C). Fragmenting parts of the production of services (Cases D and E), including or excluding Intellectual Property Products (IPPs), is quite often examined in Sweden, Ireland, Hungary and Finland. Subcontracting services' production (Case F) is often encountered in France, Ireland and Sweden. Direct investment enterprises not directly engaged in the production process required to make the good (case G) or the service (case H) are in practice only examined by the Netherlands.



Figure 4  
Most frequently examined cases of global production



82. All responding countries had not yet implemented all of the concepts suggested by the typology. New Zealand reported that global production has been considered to be insignificant in the past, but these cases will be re-assessed in 2014 in light of the 2008 SNA and BPM6 implementation.

83. Finland had encountered a new kind of case, namely project suppliers that mix the categories of the current typology. The Netherlands has encountered two cases that may not fall under any of the categories A-H:

(a) The use of nationally developed programme formats by foreign television stations and vice versa. Such companies seem to be specializing in renting out entertainment, literary or artistic originals;

(b) The exploration of oil and gas abroad, both in the case when there is a foreign establishment and in the case when there is not. When the exploration and production activities are controlled by a foreign company and the management decisions are effectively taken abroad, the legal entity in the Netherlands is regarded as an empty shell and treated as a special purpose entity (SPE). The legal entity in the Netherlands seems to be there merely for tax optimization. However, when the exploration and production activities abroad are controlled by a domestic company and the management decisions are taken by the Dutch headquarters, the situation is not that clear. On the one hand, it can be debated that the production abroad is controlled and managed by the Dutch headquarters, so that the resources flow to the Dutch legal entities and therefore production should be accounted for in the Netherlands. On the other hand, most exploration and production activities last more than one year and on that basis should be treated similarly as construction projects abroad by a multiterritory enterprise. That is, production should be accounted for in the country where the exploration and production activities take place.

## **E. Specific country experiences**

84. The countries reported in the survey some additional experiences or problems they are dealing with in relation to large and complex enterprises (Q 5.1).

85. Treatment of VAT –registrations is crucial in Hungary. These data have to be examined and adjusted regularly to reconcile the differences in concepts between international trade and national accounts.

86. In Sweden reporting of foreign trade is difficult in cases where the enterprise regards the exported items as a project. This does not fit into the Harmonized System (HS) classification, where only the good should be included. The borderline between goods and services is somewhat blurred and not in line with what was the case when the reporting of trade in goods was first developed. Transfer pricing and internal agreements between various units within the same enterprise group are also hard to keep track of in a way in which they ought to be valued according to the national accounts recommendations.

87. France is presently working on the treatment of:

- Highly integrated industries (such as plane construction) in which national production is not significant. The aim is to allocate directly value added per country (without trying to calculate it through production of equipment, assembly main lines, assembly of traveler equipment, etc.);
- The affiliates whose role is to centralize the whole global production of an enterprise group and to allocate it to distributive affiliates (mostly geographical) without physical movements.

88. Statistics Canada has achieved many objectives by implementing a program to respond to the challenges associated with the measurement of large and complex enterprises. These include:

- Evaluating data coherence and resolving issues by working collaboratively among survey subject matter staff, national accountants and business respondents.
- High quality frame for survey selection achieved by having specialized staff working directly with companies to ensure their operations are correctly identified.
- Reductions in reporting burden by having specialized staff work directly with companies to ensure the statistical information requirements are both understood and reportable.
- Mechanism is in place to rapidly respond to data quality issues. Specialized staff can quickly contact and work with company staff to resolve reporting issues.

89. In the Netherlands the LCU exists since 2010. One of its main benefits is that data editing for a number of surveys is now done within one unit instead of numerous decentralized units. This makes it much easier to correct data as early as possible in the statistical process. In the Netherlands each account manager works in a team with one profiler, who maintains the structure of the enterprise groups in the business register, and two analysts who review and edit survey data. This small team deals with all the enterprise groups and the underlying enterprises in the portfolio of the account manager. In this way the knowledge on an enterprise group is concentrated and more easily shared.

90. For two years the Netherlands has been using a consistency tool, i.e. an automated process to retrieve production data from the production systems of the source statistics and to subject these data to a number of consistency checks. This tool allows detecting inconsistencies in an efficient way.

91. Within Statistics Netherlands good contacts with the national accounts department are important to ensure that attention is paid to the key issues. Good contacts with statistical departments guarantee that the work by LCU is supported, used and acknowledged. Good documentation of findings and sharing the documentation with other departments is essential.

92. Most respondents are also willing to supply the information requested by Statistics Netherlands to solve and explain the inconsistencies. Respondents appreciate that their data are taken seriously and that the NSI tries to adjust the data collection units in a way that fits the organization of the respondent.

#### **IV. Conclusions and recommendations**

93. NSIs generally acknowledge, and are aware of the measurement challenges of MNEs, particularly in the context of global production arrangements.

94. Collecting data from large and complex enterprises will increasingly demand a multi-disciplinary approach. Survey managers, statisticians, informatics specialists, subject matter experts, respondent relationship managers and survey design specialists need to work together to ensure availability, quality and coherence of data. For statistical agencies this will require continuous thought of how the work should be organized to support such wide collaboration.

95. MNEs are generally included in practically all surveys that cover economic and business activities. Developing questionnaires in close cooperation with MNEs and tailoring questionnaires to better meet their needs may also help improve surveys in general, especially in electronic data reporting.

96. Data exchange among producers of official statistics is not yet as efficient as it could be. National division of work and legal frameworks currently limit the possibilities for data exchange. In some countries lack of common ID codes also prevents proper data linking.

97. In most countries international exchange of data among NSIs is more an exception than a regular practice. To be able to produce high quality statistics new opportunities for international consistency work should be explored. The EuroGroups register that covers MNEs including their business activities spread over Europe is a promising initiative in this direction.

98. Based on country experiences highlighted in the survey responses, close cooperation with respondents ensures better understanding of data requests and reduces response burden. At the same time knowing the most important respondents helps statisticians solve inconsistencies more efficiently. Even though the activities of LCUs vary across countries they aim to provide a mechanism to support statisticians in dealing with MNEs. In all countries LCUs can also improve efficiency by promoting use of common tools, drafting clear instructions for data collection and enhancing consistent treatment of large and complex enterprises' data.

99. The survey confirmed that the treatment of globalization is challenging, among other things, due to conceptual differences between statistics and lack of proper data sources for example on economic ownership. Additional surveying may be needed in the future to get a clearer understanding of MNEs' activities.

100. The target of the LCU work is to help improve statistical data so that it could provide a coherent description of the economy. LCU activities presented in this chapter provide examples of how to facilitate consistency of the results of statistics.

101. The recommendations from this chapter are formulated as follows. NSIs are encouraged to:

(a) Analyse the need for setting up an LCU, e.g. based on their challenges with large respondents, structure of national economy and complexity of the business sector. A relatively small size of national economy seems to make the establishment of an LCU a more containable and achievable goal.

(b) Learn from other countries that have gained experience in dealing with large and complex enterprises.

(c) Consider alternative ways to organize this work at the NSI. Engage experts from different areas to support a multi-disciplinary approach to data collection and analysis.

(d) Develop cooperation mechanisms and collaboration among producers of statistics, both nationally and internationally.

102. Although the organization, tasks and the analysed data sets may vary across countries, the survey revealed many common issues which statistical offices face. A platform to share experience and learn from each other would be very beneficial.

103. Many countries have plans to start consistency work in order to improve data quality and develop respondent relationships. Recommendations in this chapter may need to be updated when more experience has been gained.

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## Annex – Questionnaire Operation of the Large and Complex Cases Units (English only)

### 1. Organizational aspects

1.1. What kind of arrangements does your Statistical Institute make (or is planning to make) to deal with large and complex enterprises?

1.2. Does your organization have a dedicated 'large and complex cases' unit? If so, does this function as an independent unit, or as a working group with contributors from various statistical departments? If so, where are these activities located in your organization, together with business register, business statistics, national accounts, etc.?

1.3. What is the size of your national statistical institute in full time equivalents (or number of employees)? How much working time is annually spent on dealing with large and complex cases measured in full time equivalents (or number of employees)?

1.4. Are there particular skills or competencies required for dealing with large and complex cases?

1.5. Are you consulting experts from outside the Statistical Institute such as representatives from central banks or tax authorities?

1.6. Could you (roughly) allocate the labour capacity dedicated to large and complex cases to the following activities:

a. Surveying	.. %
b. Data analysis (imputations, data adjustments)	.. %
c. Profiling of enterprises	.. %
c. Company visitations	.. %
d. Coordination	.. %
e. Other (please explain)	.. %

### 2. Coverage of data sources

2.1. Please sum up the various statistics that are subject to large and complex cases examinations:

a. Business surveys	(yes/no)
b. International trade in goods survey	(yes/no)
c. International trade in services surveys	(yes/no)
d. Balance of payment surveys	(yes/no)
e. Investment surveys	(yes/no)
f. R&D surveys	(yes/no)
g. Producer price statistics	(yes/no)
h. Register data (tax, customs, ..., please explain)	(yes/no)
i. Corporate accounts	(yes/no)
j. Other data sources (please explain)	(yes/no)

2.2. Are (some of) these data source analysed on *annual* and/or *quarterly* basis?

### 3. Operational aspects

3.1. Could you briefly explain:

- how the population of large and complex enterprises (or enterprise groups) is being determined and maintained?
- what is its size in number of enterprises and kind-of-activity units?
- what prominence is given to globalization related measurement problems when determining the population of large and complex enterprises?

3.2. Could you briefly explain:

- a) if respondents, or company representatives, consider centralized surveying, by approaching only one contact person in their organization, feasible and desirable from their point of view?
- b) if customized survey forms, or customized survey methods, are used for large and complex enterprises?
- c) If so, could you explain how respondents are being consulted in setting up these customized surveys?
- d) Do you use electronic surveying methods, for example based on XML or XBRL?

3.3. Do you believe that respondents, or company representatives, generally understand the concepts of “domestic economy”, “residency” and “economic ownership” applied in official statistics and national accounts, and how these concepts may relate to information available at corporate level?

3.4. Which data sources are leading when measuring activities such as industrial processing and merchanting? How are in this respect the conceptual differences between international trade in goods statistics and national accounts overcome? Do you use specific data sources to measure economic ownership of goods, inventories or assets held abroad?

3.5. Does your analyses of large and complex cases also include R&D: production, capital formation and international trade? Which data sources are examined in this respect, and on what principles is economic ownership of R&D assets inside multinational enterprises being determined?

3.6. Are you able to link, on enterprise or establishment level, the results from international trade surveys and business surveys?

3.7. Do you examine the activities of multinational enterprises in cooperation with other national statistical offices? Is there a legal framework in place that regulates (or inhibits) data sharing or data linking?

3.8. How are encountered inconsistencies solved in source statistics, national accounts and balance of payments statistics? Are there timeliness and continuity issues that need to be solved in this respect?

#### 4. **Typology**

4.1. Could you indicate on a scale of 1 to 5 which ‘standard’ cases of global production, as introduced in *chapter 2* of the task force report, are most frequently examined? ( 1 = hardly, 5 = very often):

Case A1: Production abroad of materials owned by domestic principal

Case A2: Domestic production of materials owned by principal abroad

Case B: Merchanting

Case C: Factoryless Manufacturing

Case D: Supplying Intellectual Property Inputs

Case E: Outsourcing part of the production of services

Case F: Subcontracting production of services

Cases G and H: Direct investment enterprises not directly engaged in the production process required to make the good (case G) or the service (case H).

4.2. Did you encounter significant case studies, which do not seem to fall under one of these categories (A-H)? If so, could you briefly describe these cases?

#### 5. **Specific country experiences**

5.1. Do have specific experiences or problems that are worthwhile mentioning for the benefit of this questionnaire which are not addressed in previous questions?