Sharing data on the activities of multinational enterprise groups: Innovations to redesign statistical practices and processes

Timo Koskimäki[a],[*] and Rami Peltola[b]
[a]*Statistics Finland, FI-00580 Helsinki, Finland*
[b]*United Nations Economic Commission for Europe, Palais des Nations, CH-1211 Geneva 10, Switzerland*

Abstract. The professional discussion on "The future of economic statistics" has a practical driver: Economic statistics, produced by national statistical offices, face severe difficulties in describing the national and global economic development in a relevant and coherent manner. This is not only our perception as statisticians – there is a growing criticism towards traditional economic statistics among researchers, policymakers and other users. In this article, we reflect on the factors that have caused the current situation and propose solutions to improving the situation by data sharing. One aspect of the solution relates to the role of national statistical offices. Instead of being solely national institutions, dealing with national data only, they should exploit the possibilities of using statistical data, collected by statistical authorities of other countries, to produce better quality economic statistics. The other aspect of the solution is the sharing of innovative practices to understand and correctly record the activities of multinational enterprise groups (MNEs). The proposals we make in this article are not restricted to MNEs but are applicable to any type of economic activity with a cross-border dimension. The observations we make here are based on the work done when preparing the UNECE Guide to Sharing Economic Data.

Keywords: Data sharing, innovation, globalization, multinational enterprise groups

1. Introduction

For about a century or so, statisticians have engaged internationally to agree on statistical classifications, concepts, definitions and methodologies to ensure global comparability of the statistical information. In a world of closed borders, protective trade barriers, restricted financial markets and mostly national generation of wealth, it was perfectly reasonable to focus the international cooperation in official statistics on developing common standards and leaving all the rest of the statistical production to the domain of national statistical offices.

Unfortunately, the world has been rapidly evolving for about half a century or so. The statisticians' response to diluting borders, barriers and restrictions – i.e. globalisation – has been to increase the level of detail in statistical standards and develop new guidance. As an example, we can take the first global manual on National Accounts from early 1950's (A System of National Accounts and Supporting Tables, United Nations, 1953). The book contained some fifty pages only. The most recent version of the System of National Accounts (System of National Accounts 2008, European Commission, IMF, OECD, UN, World Bank, 2009) is more than 700 pages long. We can see same kind of developments in almost any statistical area; consumer price index manuals have grown from a couple of pages in the early 1900's to close to 800 pages in the most recent version (Consumer Price Index Manual – Concepts and Methods, International Labour Office, International Monetary Fund, Organisation for Economic Co-operation and Development, Statistical Office of the European Union (Eurostat), United Nations Economic

*Corresponding author: Timo Koskimäki, Statistics Finland, Työpajankatu 13, FI-00580 Helsinki, Finland. Tel.: +358 29 551 3495; E-mail: timo.koskimaki@stat.fi.

Commission for Europe, The World Bank, white cover publication, pre-edited text subject to official editing, January 2020). In addition to core national accounts we nowadays also have the Balance of Payments and International Investment Position Manual, Sixth Edition (BPM6) (350 pages), System of Environmental-Economic Accounting 2012, Central Framework (almost 350 pages), and a number of manuals and practical guidelines on specific statistics.

It is striking that all the increasingly detailed standards statisticians are creating, rely strictly on a national approach to data collection and statistics compilation. We are facing a situation where economic actors – be it MNEs or other enterprises engaged in cross border activities act and think globally, whereas statisticians act and think locally. The situation is not sustainable. Innovative solutions to improve the situation are urgently needed.

2. Innovation and data sharing

Innovation can be defined as non-routine, significant, and discontinuous organizational change that embodies a new idea that is not consistent with the current concept of the organization's business [1]. Data sharing has the potential of bringing a major change to the traditional business model of official statistics and challenge statistical offices to review and modernize their work. With data sharing (or exchange) we refer to the sharing of data and accompanying metadata among producers of official statistics strictly for statistical purposes only. The data that are shared can be qualitative, quantitative, confidential, non-confidential, aggregated or disaggregated, collected directly or otherwise obtained by statistical authorities from varying sources, or data that are publicly available.

Innovation is a process starting from insight, followed by problem identification and leading to a solution. The Chief Statisticians' debate in the Bureau of the Conference of European Statisticians (CES) in October 2016[1] provided this insight to international data sharing for economic statistics, and the process was launched with an in-depth review of data sharing to

define the problem. The Chief Statisticians of the CES member states then established a UNECE Task Force to find and propose solutions for statistical authorities. A central question related to innovation is how to translate individual insights and knowledge into collective understanding and capability in the national and global statistical systems.

The Oslo Manual [2] defines innovation as a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method. Data sharing influences all these aspects, as it introduces changes to the product (quality), service (respondent burden), the process of statistical production (data flows) and the customer experience (consistency). The fourth type of innovation, organizational innovation, is defined as changes to the business practices, workplace organization or external relations. Again, data sharing has all the elements of organizational innovation with the potential to fundamentally change official statistics.

MNEs' data are a critical element for economic statistics. In this article, with the term 'economic statistics' we refer to macroeconomic, trade and business statistics. If MNEs' data are wrong or missing, national statistics will be greatly affected and will not be of sufficient quality to support governments or business decision making.

While globalisation presents new opportunities for businesses that seek more efficient and more profitable ways to manufacture their products, their innovative and agile global production arrangements challenge statisticians, often in unexpected ways. In recent years, the challenge has become even larger due to the increasing intensity and complexity of MNE's global arrangements, changing intra-group structures and agreements, and the evolving division of intangibles and R&D across countries.

The national activities of MNEs must be viewed in the context of their global operations to ensure the accuracy of both national and international figures. The largest businesses often receive many statistical surveys, perhaps from different statistical authorities and even from different countries, and it may be difficult for the MNE itself to properly determine which activities should be reported in which country. Inconsistent treatment of the few largest MNEs can lead to huge discrepancies and asymmetries in global key statistics.

Statisticians joined forces to figure out how to compile statistics that appropriately reflect globalisation. Global problems require global solutions. Indeed, data sharing emerged in these discussions as a game changer for statistical production.

---

[1] The October 2016 discussion at the CES Bureau involved the following Chief Statisticians: M. Bruun (Chair, Finland), S. Mnatsakanyan (Armenia), K. Pesendorfer (Austria), A. Arora (Canada), J. Santaella (Mexico), E. MacPherson (New Zealand) and J. Pullinger (the United Kingdom), as well as M. Kotzeva (representing W. Radermacher, Eurostat), J.R. Rosales (representing L.M. Ducharme, IMF), M. Durand (OECD) and L. Bratanova (UNECE).

The global statistical system needs to act decisively and in coordination to develop data sharing to achieve a complete and accurate picture of MNE activities. This calls for building a more consistent and efficient global statistical system that enables the reaping of benefits from shared data and from the available technologies to do so. More focus needs to be put on the consistency of statistics so that they can offer worthwhile insights about national economies, global value chains, economic interlinkages across countries and developments in the global economy.

We need a vision to lead us forward with innovative solutions for effective data sharing in official statistics. So, what kind of a vision would help us thrive? If official statisticians had all the data needed, what could we achieve? We could reconcile the data on MNEs globally and produce economic statistics without statistical asymmetries, gaps or double counting. The same data could only be collected once from an MNE to be used several times for producing different statistics by various statistical authorities across countries. Policy makers, businesses and researchers would be able to base their findings and decisions on more accurate statistics.

Are we there yet? Are we getting close? It seems we are still far from being able to put together all relevant data on MNEs. First, we need to translate this vision, step by step, into practice. A series of questions need to be answered. Where would the MNE data reside – in a global statistical data base? How would the data end up there – through a secure data exchange platform? Who would be responsible for data collection and validation for global MNEs – would there be a single point of MNE data collection or multiple? Who would be responsible for management of the global statistical database? Who would be certified to have access to the global database with confidential MNE data? Who would certify statistical authorities and qualify them for such access? What if there are breaches?

These are tricky questions that cannot be all answered at once. This paper contributes to the process by reflecting on the thinking developed in the work of an internationally composed UNECE Task Force that developed a Guide to Sharing Economic Data.

3. The CES approach to data sharing

The paper is based on the findings of international statistical work carried out by the UNECE Task Force on the exchange and sharing of economic data during the past years. The work was launched as a reaction to the view held by Chief Statisticians in the CES Bureau that in a globalised economy, national official statistics cannot anymore be produced in isolation from the rest of the world if we want to ensure the high quality and the overall relevance of economic and business statistics.

In October 2016, the Chief Statisticians noted that compiling national statistics is becoming increasingly challenging in the globalised world. They recognised that a cultural change is required in the way statistics are produced at national and global levels. The Chief Statisticians called for urgent work to operationalize the exchange of data between national statistical offices. International data exchange between the producers of official statistics for statistical purposes was seen as a prerequisite for statisticians to be able to depict economic reality, profile multinational enterprises and provide accurate and consistent data on their activities.

The Chief Statisticians also asked for guidance to statistical offices as to how to communicate with multinational enterprises in a way that creates trust and ensures transparency. They considered it important to explain clearly why data exchange is necessary for national and global statistics, and to inform multinationals in one voice how confidentiality will be kept in all stages of data exchange and across all parties involved in data exchange.

In 2016, UNECE conducted a survey of countries' experience in data sharing. National Statistical Offices and entities of National Central Banks (NCBs) from 48 countries replied to the survey. The survey covered the current scope of economic data exchange nationally and internationally, organizational aspects of data sharing, benefits and challenges experienced and suggestions for international activities that might support national capacity development.

The survey showed that data sharing for statistical purposes was quite common among institutions at national level. However, statistical authorities engaged rarely in international data sharing with statistical authorities from other countries. These cases related to the recording of cross-border transactions and to the reduction of bilateral asymmetries between countries. These data exchange cases were either facilitated by international organizations, such as Eurostat, or based on bilateral or multilateral agreements between countries. The European Statistical System (ESS) has a robust legal framework in place enabling international data exchange and an exchange of data between national statistical offices and central banks.

In recent years, the reuse of micro-data has increased

nationally and has started to increase also internationally between countries. This was a consequence of the changes in the European statistical law and Eurostat's single market statistics (SIMSTAT) project that enabled international micro-data sharing between statistical offices of the European Union (EU) member states in the domain of international trade in goods statistics. Since then, many innovative microdata linking and exchange initiatives have been implemented in the EU.

A quarter of responding offices had examined the activities of MNEs with another countries' statistical authorities and a third of the offices had worked with other producers of official statistics within their own country. However, at the time of the survey, the exchange of data on MNEs was still relatively rare outside the EU.

The CES Bureau carried out an in-depth review of economic data sharing. As a result, the CES Bureau established a UNECE Task Force on exchange and sharing of economic data in March 2017. The Task Force consisted of experts of national accounts, balance of payments, business statistics, foreign trade statistics and other economic statistics from the following countries and international organizations: Canada, Denmark, Finland (Chair), Italy, Ireland, Mexico, Poland, the Netherlands, United Kingdom, United States, European Central Bank (ECB), Eurostat, the International Monetary Fund (IMF), the Organisation for Economic Co-operation and Development (OECD), UNECE and the United Nations Statistics Division (UNSD). UNECE provided the Secretariat for the Task Force.

In the course of its work, the Task Force engaged in regular coordination with several expert groups in statistics and provided input to the work undertaken by the OECD Working Parties on National Accounts and Financial Statistics, and the Advisory Expert Group on National Accounts, the United Nations Expert Group on International Trade and Economic Globalization Statistics (ITEGS), the G20 Data Gaps Initiative, Eurostat's Integrated Global Accounts (IGA) project, the relevant CES Task Forces and the Data Integration Project under the UNECE High-level Group for the Modernisation of Official Statistics. The Task Force consulted experts and expert groups widely to learn from ongoing work, such as related initiatives of UNSD, Eurostat, OECD, World Trade Organization (WTO) and IMF. The UNECE/Eurostat/OECD Group of Experts on National Accounts and the CES Bureau provided a sounding board for discussing the Task Force's findings in the course of its work.

4. Old certainties versus new possibilities

The introduction of data sharing must be done respecting the traditions of official statistics and in adherence with the Fundamental Principles of Official Statistics and legal frameworks. March [3] points out that a fundamental tension in organizational learning is balancing the competing goals of "the exploitation of old certainties" and the "exploration of new possibilities". A good example of a contradiction between old certainties and new possibilities is the relationship of statistical confidentiality and data sharing.

Safeguarding statistical confidentiality is fundamental to official statistics. It cannot be compromised. Nowadays maintaining the trust of business respondents requires increasing attention from statistical authorities, especially due to the use of multiple new data sources, increasing data integration and the release of rich combinations of data to meet user needs. Businesses' willingness to provide truthful and accurate data in a timely fashion can be greatly influenced by their trust in statistical authorities. Distrust, on the other hand, could threaten the very foundation of official statistics, reliable source data, and, thus, the capacity of official statistics to inform society.

Transparency and effective communication with MNEs about data sharing contribute to building trust. Respondents must be ensured that confidentiality rules apply also when data are shared with statistical authorities in other countries and that data collected or acquired for statistics will not leave the statistical system. Respondents must be informed of the use of their data.

The reuse and sharing of data also provide opportunities for improved respondent service and reduction of response burden. Many statistical offices have invested in good communication and relationship management with MNEs. In addition to technical innovations, data sharing requires cultural change and innovation in the way things are done.

Statistical offices are professional organizations that rely in their operations on internationally agreed statistical standards and recommendations, in particular the Fundamental Principles of Official Statistics and the related European statistics Code of Practice, as relevant. When considering data sharing, the most important of these Fundamental Principles are the following:

– Principle 2. To retain trust in official statistics, the statistical agencies need to decide according to strictly professional considerations, including scientific principles and professional ethics, on the methods and procedures for the collection,

processing, storage and presentation of statistical data;

– Principle 5. Data for statistical purposes may be drawn from all types of sources, be they statistical surveys or administrative records. Statistical agencies are to choose the source with regard to quality, timeliness, costs and the burden on respondents;

– Principle 6. Individual data collected by statistical agencies for statistical compilation, whether they refer to natural or legal persons, are to be strictly confidential and used exclusively for statistical purposes; and

– Principle 10. Bilateral and multilateral cooperation in statistics contributes to the improvement of systems of official statistics in all countries.

Principles 5 and 10 can be considered enablers of data exchange. Principle 5 gives national statistical offices a general mandate to use data collected by other organizations. Principle 10, in turn, urges statistical authorities to collaborate with each other to improve statistics globally.

Principles 2 and 6, however, pose some challenges to be considered carefully in the context of data exchange between statistical organizations. The reasons are the following:

– When using secondary data, national statistical offices do not have control of the methods and procedures, when collecting and processing of data is carried out by another organization. However, the NSO shall remain professionally independent in selecting the data sources to be used (principle 5). This also applies to the choice between using administrative data or collecting data directly;

– Currently methodologies for the use of secondary data are far less developed than the methods for compiling statistics based on direct data collection;

– Confidentiality is a key concern when engaging in data exchange. While data collected for statistical purposes are to be strictly confidential and to be used exclusively for statistical purposes, statistical laws often allow the use of statistical data for scientific research when authorized by the NSO. In the EU, the European Statistical Law enables the exchange of individual data among NSOs and Central Banks in the EU, while the national practices of how this principle is applied varies a lot;

– Statistical legislation also typically treats data acquired by statistical offices from administrative data sources as confidential when acquired for statistical purposes. The same administrative data may not be confidential in the legal settings governing the activities of the public organization that collects them; and

– Confidentiality of business information is a great concern to respondents. Good communication and close collaboration with respondents when sharing data for statistical purposes is, therefore, crucial.

The next review of the Fundamental Principles of Official Statistics should reflect, and promote, the need for data sharing in the global statistical system and collaboration between national statistical systems. The review should include a principle and suite of protocols to encourage international data sharing, data exchange and data reconciliation between countries' official statistical bodies. This should cover cross-border activities for statistical purposes (not for publication as such) in order to improve the measurement of official statistics on MNEs and related activities as well as addressing asymmetries in terms of consistency, coherency and quality.

Data sharing between statistical authorities must respect "old certainties". Confidential data can only be used for statistical purposes, not for any administrative purposes or decisions about individual businesses. The statistical authorities with access to data must have a legal framework in place to ensure the full protection of statistical confidentiality. Confidentiality has to be ensured in all phases of data processing, and confidential data can never leave the statistical system.

5. Spring of innovative practices to boost data sharing

The UNECE Guide to Sharing Economic Data (forthcoming) makes recommendations for a phased approach to international data sharing for economic and business statistics. Data sharing can involve the exchange of non-confidential aggregates, and only if needed, the exchange of confidential microdata. It can be either continuous, or one-off exchange to address a particular issue. The sensitivity of the shared information increases in a continuum of sharing aggregated data, sharing publicly available data on individual units, sharing metadata on the treatment of individual units, or sharing confidential individual data.

The following cases are intended to provide examples of the innovative nature of data sharing and promote the application and development of similar solutions to advance data sharing in the future. The cases have been grouped by type of innovation, but several good practice cases could be reported under more than one type of innovation.

5.1. Product innovation – one-off or regular data sharing for better quality

In recent years, several statistical offices have engaged in data sharing exercises with statistical offices of important trading partner countries. They have come to realise the pivotal importance of data sharing to producing relevant and reliable economic statistics. These exercises have led to product innovation, i.e. significantly improved quality and consistency of statistics. For instance, the bilateral trade asymmetry between Canada and China was USD 21.3 billion in 2016, but during the one-off exercise to share aggregate level data and metadata, the countries were able to explain USD 20.3 billion of the asymmetry with different statistical treatment between the countries and then correct it. The countries exchanged and compared bilateral trade in goods and services data and exchanged information on conceptual and methodological approaches involved in the collection and compilation of trade statistics. After adjusting for known and measurable factors such as time lag, re-exports and valuation, statistical differences still exist. More information on this exercise is available at the website of Statistics Canada (https://www150.statcan.gc.ca/n1/pub/13-605-x/2018001/article/54962-eng.htm).

While differences in legal set-ups can bring challenges, bilateral agreements between statistical organizations are an effective way of engaging in regular microdata sharing. Statistics Canada and the United States Census Bureau have a long-lasting set-up for the sharing of customs import transactions data since 1990. The exchanged data are used to compile export statistics and to ensure their high quality. The simplicity and the lasting nature of this Memorandum of Understanding shows that international data sharing can be operationalized to serve as a regular part of statistical production.

There are also some examples of innovative multilateral data sharing, particularly in the EU, that has a legal framework in place enabling data sharing in statistics. In 2009, Eurostat and the European Central Bank (ECB) established an 'FDI Network' to address the problem of asymmetries in foreign direct investment (FDI) statistics. The FDI Network facilitates secure exchange of individual data on FDI transactions and positions between EU statistical authorities. The FDI network serves as a good example of how to organize multilateral data sharing around one statistical product and Eurostat is prepared to share their expertise in running such networks beyond the EU.

5.2. Service innovation – improving respondent service for MNEs

Data sharing, on national and international level, helps to avoid excessive burden on respondents. Nationally, statisticians already aim at collecting data only once and reusing data across statistical domains within the NSO or the national statistical system. Countries have managed to share data and develop joint data collections between statistical authorities to reduce the time and resource use of businesses when they receive only one survey instead of two or three. Developing international data exchange within official statistics offers a possibility to reduce further the response burden by reusing data collected by one statistical authority, if it is required for the official statistics of another country. NSOs would not need to do additional data requests for MNEs in each country if the collected data could be exchanged.

The EU has been long monitoring and measuring the statistical response burden on businesses. The idea of producing EU trade statistics based on a single flow system within the EU was long debated – intra-EU export data would be exchanged to calculate intra-EU imports. This would bring a massive reduction in response burden for businesses since intra-EU imports would not need to be reported, but it would also improve quality by reducing significantly the asymmetries of trade statistics within the EU. An experimental project first investigated the statistical reusability and quality of the exchanged data and the technical feasibility of exchanging large volumes of data in a secure and timely manner so that it could be integrated to monthly statistical production. The main challenges are the dependency on data from other countries, timing of data exchange and ensuring data confidentiality and security. This exchange of microdata on intra-EU trade in goods just became mandatory among EU Member States.

When MNEs are significant players in the economy of a country, and thus in statistics, it makes sense to establish solid working procedures for dealing with respondent relations and MNE data. Many national statistical offices have set up large and complex cases units (LCUs) to deal with these tasks, often including MNE relations. Statistics Canada [4] has developed a respondent relations management programme with strategic pillars, such as promoting the agency's positive image and credibility, protecting the confidentiality of respondent information, working continuously to reduce the response burden as much as possible and encouraging respondents to participate in surveys. These strategic

goals are particularly important when engaging in data sharing and communicating about it with respondents, since one of the MNEs' key concerns relates to the confidentiality of their data.

Further collaboration of statisticians and MNE representatives could be pursued also internationally at the meetings of the Business at OECD (BIAC) and the UN Standing Intergovernmental Working Group of Experts on International Standards of Accounting and Reporting. Closer alignment of statistical reporting and accounting standards, at least a mapping of concepts, would enable better service for business respondents e.g. in the form of automated data extraction for statistics.

5.3. Process innovation to statistical production by data sharing

It all started with the Euro Groups Register (EGR) – a shared register of MNE structures for use by EU countries. It is an important process innovation for European statistics. The EGR is a unique statistical business register, covering MNEs which are partially or fully active in the EU. National statistical offices share their data on legal units, relationships, enterprises and enterprise groups, and these data are complemented with commercial data. Based on all this, the EGR creates the global structures of MNEs as a result of the joint effort of statistical offices. All statistical compilers in the EU can benefit from the information and use the enterprise structures as the frame for economic and business statistics. The EGR provides all compilers a harmonised picture of the MNE structures and characteristics in the EU helping with a consistent delineation of cross-border phenomena. The sharing of data on FDI flows within the EU has benefitted from the EGR data and led to the harmonization of statistical methods in the measurement of FDI across EU member states.

A great example of an innovation that shows how much can be done by reusing and organizing publicly available data better, is the OECD's Analytical Database on Individual Multinationals and their Affiliates (ADIMA). It leverages new and traditional data sources by web scraping and innovative Big Data techniques to compile a harmonised and blended dataset of publicly available data on the scale and scope of the international activities of MNEs. ADIMA draws on MNEs' financial and non-financial variables from annual company reports and corporate sustainability reports, the Global Legal Entity Identifier Foundation's (GLEIF) Legal Entity Identifier (LEI) database, MNEs'

websites and attributed Internet page rank. In addition, it receives digital inputs from Wikipedia and the Global Database of Events, Language and Tone (GDELT) news services. As a result, ADIMA provides a series of economic indicators by MNE and country, a register of MNE parent-affiliate structures, a register of MNE digital presence through websites and early warnings on potential restructurings of MNEs with significant impacts on trade, gross domestic product (GDP) and foreign direct investment (FDI). ADIMA includes data on MNE revenues, profits and taxes paid, including the effective tax rates. Further information on ADIMA is available at: https://www.oecd.org/sdd/its/measuring-multinational-enterprises.htm.

The Early Warning System (EWS) is an interesting process innovation that enables occasional, ad-hoc data sharing among statistical authorities, as needed. The idea is to identify important MNE restructuring cases, often from publicly available data, and to agree on a common recording for restructurings, preferably before the changes materialise or before they need to be incorporated in statistics. The EWS platform helps ensure the consistency of applied methods, statistical treatment and communication involving MNEs across countries. The light procedure developed for voluntary cooperation between EU statistical authorities and Eurostat is another great model for other countries.

International profiling of MNEs has brought a useful process innovation to official statistics. The ESS Vision 2020 acknowledged that "better understanding of the structure of enterprise groups and the change over time is necessary for the quality of business statistics". Accordingly, national statistical offices have engaged in joined profiling of MNEs. As a result, for instance, analysing data at a global level using annual accounts and data shared by other national statistical offices resulted in the identification of significant missing turnover in the United Kingdom. Once cooperation was established, most offices had no issues regarding sharing the data securely with other national statistical offices in Europe. For some cases, the majority of information was available in published company accounts. The quality of statistics would benefit from the profiling of the largest global MNEs. The pilots showed that the profiling of MNEs based on nationally available data only does not provide a reliable enough picture of the entire MNE. National profiling often led to different conclusions on the MNE characteristics than international profiling.

The United Nations Statistical Commission, in 2015, recognized the importance of the development of a

Global Group Register (GGR) building on and taking into account lessons learned from the Euro Groups Register. The United Nations Statistics Division has been working closely with Eurostat and other partners to build a GGR which is expected to be released this year.

5.4. Innovating user experience – better relevance and consistency for users

Earlier mentioned data sharing between statistical offices of important trading partner countries to improve trade statistics is also important to users and analysts of trade statistics. For instance, various analysts estimate illicit financial flows and trade misinvoicing applying the partner country trade data comparison method. However, this method assumes that the asymmetries of trade statistics between partner countries would exhibit illicit financial flows. In reality, however, the statistical reasons for asymmetries can be surprisingly large, as was shown in the example of trade between Canada and China. Quality improvements by reducing such trade asymmetries are very important for the users of statistics.

Fundamentally, all data sharing exercises between statistical authorities aim at improving the quality of statistics compiled and published for users. Inter-agency collaboration is important for ensuring the quality of key economic statistics, such as international trade statistics, balance of payments, and sector accounts and the rest-of-the-world accounts compiled as part of the national accounts. Users of statistics benefit from the provision of more consistent and coherent statistics, and from a better understanding and analyses of how MNEs' activity affects the measures of economic activity. Heavy users of statistics benefit most, e.g. those preparing macroeconomic projections and simulations and carrying out economic research can provide more accurate insight and policy advice.

5.5. Organizational innovation – changing the business model of official statistics

In recent years, statistical offices have developed ways of dealing with global production arrangements and treating MNEs in statistical production. Some have established specialized organizational units, often called large cases units (LCUs), to deal with large and complex businesses. In early 2019, the national statistical offices of Canada, Denmark, Finland, France, Hungary, Ireland, Italy, Luxembourg, Netherlands and Sweden had established a LCU, while the United Kingdom was

carrying out a pilot to develop an International Business Unit. In Belgium, the central bank, and the statistical office of Norway are considering setting up permanent LCUs. Many countries have dedicated programmes to perform similar activities as LCUs, for example, profiling of MNEs and other complex cases. The major benefit of a LCU is the collection of timely and accurate data on MNEs enabling a prompt reaction to data changes and the resolution of anomalies and inconsistencies before they are processed by individual statistical domains. Therefore, the Guide to Sharing Economic Data recommends to every country with a significant number of MNEs the establishment of such a unit.

What comes to international organizational innovations, the ESS – Eurostat and the national statistical offices of the EU Member States – is perhaps the most far-reaching example: The legal system governing statistical production in the EU consists of a set of legal acts, and a consolidated European Statistical Law to ensure the efficient functioning of the ESS. This is the only international legal framework enabling data sharing across country borders. This provides a great example going forward, one that cannot be achieved fully in other countries, but that can provide inspiration and direction.

MNEs are global and we need to develop a modern global statistical system within which we can exchange confidential data while ensuring that they will not leave the statistical system and that data privacy and statistical confidentiality are fully protected as well as the use for statistical purposes only guaranteed. Safeguarding statistical confidentiality is essential to maintaining the trust of users and stakeholders and ensuring the sustainability of official statistics. The key element to building trust among MNEs and other respondents is having a proper legal framework for national and international data sharing for statistics.

5.6. Technological innovation enables data sharing

Technological innovations are and have been important in enabling data sharing for statistics. Recent innovations are moving statistical compilation to shared computation environments and to the sharing of the results of computations instead of data sharing. This helps to preserve privacy and protect sensitive data as they are processed remotely and not shared directly. The UN Global Platform provides a digital platform enabling international collaboration in shared computation.

Enterprises are digitalizing their information management systems. These digitized systems are increas-

ingly standardized, rigid and adapted for international accounting standards. It is important to engage with MNEs using the language of business and accounting, rather than the language of statistics. Statistical offices have made efficiency gains by engaging with business software providers to build automated statistical reporting building on established accounting standards and existing information systems of businesses. For instance, Statistics Finland introduced an automated survey for accommodation statistics, one of the most burdensome surveys of statistical offices. Data are transmitted directly from the booking system of a hotel or similar establishment. They include all variables of the monthly accommodation survey, such as the number of overnight stays and arrivals by country of origin, room and bed capacity as well as sales. The information is further used for the compilation of the balance of payments statistics and the tourism satellite account. This approach was soon expanded to other Nordic countries and has inspired developments in Europe.

In March 2020, the European Commission reached an agreement on accessing data on holiday and other short-stay accommodation offered via international platforms Airbnb, Booking, Expedia and TripAdvisor directly. The shared data includes variables like number of hosts (number of hosts renting out one or more listings), number of listings, number of bed places, number of stays, number of nights rented out, number of overnight stays (number of guest nights spent at each listing during the reference period). The data are collected quarterly by Eurostat in a central repository and then distributed to each Member State in an aggregated form for the compilation of national statistics. In the aggregation, a fairly detailed regional breakdown (municipality level) is used, as well as information on the country of origin of the guests.

Technological tools for bilateral and multilateral data exchange should be shared and, as beneficial, be developed jointly among statistical offices. The counterparts of data exchange should work together to create standardized data structures and use common definitions, units and classifications. Such collaboration needs to be continuous if data need to be exchanged regularly, and these standards should be shared within the global statistical community to ensure interoperability of data sharing software, tools and systems. While innovation can be useful, technical data sharing arrangements should be developed by applying well-established standards as a priority:

- SDMX for describing the target data structures; and

- Common Statistical Production Architecture (CSPA) for developing the statistical data architecture.

While individual statistical authorities may have a limited computing capacity, different service providers may prove helpful. In cases where data exchange is ad-hoc and limited to a small list of participants, the mesh might be a useful solution. The development of international platforms to share experience in data exchange, including discussions on concrete country practices, would contribute to raising statistical authorities' awareness and knowledge of data exchange, and sharing innovations. Moreover, platforms for data exchange established for a particular purpose, such as the FDI Network of Eurostat, have been successful in facilitating, via a technical infrastructure, secure data exchange. Here, statistical authorities should rely on the expertise of IT companies to develop secure data sharing platforms.

5.7. Cultural innovation – key to making it happen

Discussion often focuses on legal barriers and technical issues that need to be solved, even though engaging in data sharing requires, more than anything, a profound cultural change in statistical systems. International organizations are key players in promoting this cultural change and providing discussion fora to share country experiences. The UNECE/Eurostat/OECD Group of Experts on National Accounts and the CES Bureau have been fundamental in this regard. One of the key roles of a LCU is to facilitate the necessary cultural change within the organization and/or across organizations.

The one office, perhaps ahead of others in embracing the cultural change, is Statistics Canada. They decided to review the legal, technical and financial frameworks for data sharing. The review helped overcome many cultural constraints and maximize the amount of information which can be shared for statistical purposes in the current conditions. Furthermore, as previously discussed Statistics Canada has developed an enterprise portfolio management programme, following the model of customer relationships management programmes that are common in the private sector. This is also changing the service attitude from seeing MNEs as objects of mandatory surveys to understanding their strategic importance as stakeholders of the statistical office and enablers of the production of official statistics in high quality. It has introduced a new culture of looking at surveying from the respondents' perspective.

Effective communication is key to overcoming cultural barriers and trust issues. In the United Kingdom,[2] the statistical confidentiality principles have been summarized into what is commonly called the "Five Safes": Safe people; Safe projects; Safe settings; Safe outputs; Safe data. When summarized for the data sharing context, the following conditions of data sharing apply:

- Only recognized statistical authorities and their staff who have been accredited are involved;
- Data will be used exclusively for statistical purposes to deliver high-quality official statistics;
- Data will reside in a secure setting where it is impossible for unauthorized people to access data;
- All statistical outputs are checked and confirmed as non-disclosive; and
- Only the minimum amount of data to fulfil the mandate of statistical authorities is exchanged.

6. Innovation in other industries to learn from

Important progress has been made by the OECD/G20 Inclusive Framework on Base Erosion and Profit Shifting (BEPS), where over 135 countries are collaborating to put an end to tax avoidance strategies that exploit gaps and mismatches in tax rules to avoid paying tax. The BEPS initiative has increased transparency by establishing a new reporting mechanism in the form of a dashboard of BEPS indicators and launching a new BEPS Action 13 on country-by-country reporting among tax authorities. Under this action, jurisdictions commit to requesting the largest MNEs, i.e. MNEs with more than €750 million in consolidated revenues to provide the global allocation of their income, taxes and other indicators of the location of economic activity. Information to be compiled by MNEs includes the amount of revenue reported, profit before income tax, income tax paid and accrued, the stated capital, accumulated earnings, number of employees and tangible assets, broken down by jurisdiction. MNEs are required to provide the report annually for each tax jurisdiction in which they do business. Several national statistical offices have already requested access to the country-by-country reporting data held by their local tax authorities. This may provide an important source of information for validating MNE data within and across EU countries.

According to United Nations Office on Drugs and Crime (UNODC) every year criminals launder some $1.6 trillion in illicit funds across the globe. Toughening data privacy regulation, like the EU General Data Protection Regulation (GDPR) impose strict limits on the processing and sharing of personal information, which also poses a barrier to authorities' efforts at curbing money laundering. Data sharing is key for pattern spotting. Banks have, therefore, embarked on techniques relying to artificial intelligence and machine learning to help identify and thwart illicit transactions. Banks simply cannot rely on their own data only. It would deny them the full picture of potentially suspicious activities. International data sharing using innovative technologies designed to preserve data privacy is key to combatting money laundering. Leading authorities, like the United Kingdom's Financial Conduct Authority (FCA) have developed new solutions using Privacy-Enhancing Technologies (PETs) to allow such data sharing.

Customs authorities have long engaged in international data sharing to facilitate legitimate border crossing of goods and services by means of secure electronic exchange of information between Customs authorities of other countries. This data exchange is intended to mitigate the many obstacles, costs and difficulties international transport faces at borders. In view of the large volumes of cross-border transport, Customs authorities cannot control every vehicle or container anymore. Instead, they have had to adjust their business model to engage in risk management and identify high risk consignments by exchanging and analysing data available through a common Electronic Data Interchange system. This data exchange also enables the analysis of trade flows, and prevention of illegal activities, such as trade misinvoicing, tariff, duty and revenue offences etc.

For example, in the European Union the exchanged data contains most of the data elements included in the standard customs declarations (SAD) containing commodity classification, commodity description, value and quantity of the goods, customs procedure applied etc. For the Intra-EU trade, a similar sharing of data will be carried out in the near future, the legal act enabling this exchange was adopted in 2019. The contents of intra-EU data exchange are of the same type as for trade with countries outside the EU, with some simplifications relating to the fact that o customs procedures are applied within the EU. Also, the Intra-EU trade data is based on (large) samples, not on totals as in the case of regular customs data. The practical arrangements relating to trade data exchange ensure the confidentiality and data security of the exchanged data. The measures taken are

---

[2]The 'Five Safes' – Data Privacy at ONS: blog.ons.gov.uk/2017/01/27/the-five-safes-data-privacy-at-ons/.

based on data protection- and confidentiality regulations and include measures like formal data security certification of the actors and processes applied.

Private businesses are increasingly aware of the value of data and are striving for innovation to utilise data to improve productive and feed economic growth. For instance, some businesses have extended their activities to new areas just to get access to data on consumer behaviour. Now companies are discussing how to create a common data market place for data exchange, where the owners of the data, i.e. private people, could provide their data for purposes they select, for instance medical or environmental research, and would get a compensation when their data are used.

7. Conclusion

Data can fuel a culture of innovation and growth. Yet, even businesses struggle to use data to the full potential, and many companies need to re-invent their approach to data governance, analysis and evidence-based decision making. The same is true for statistical offices – even professional data experts need to reinvent their ways to ensure their relevance.

The decision to engage in data sharing for statistical purposes will be influenced by the overall pressure to reduce response burden, reuse and manage existing data better and retain the high quality of economic and business statistics in the face of the data challenges posed by globalization. Engaging in data sharing for statistical purposes is likely to require a review of statistical legislation and data sharing agreements to ensure full adherence with statistical confidentiality, possibly a new data sharing policy, the necessary systems enabling secure data sharing and new governance procedures. Each of these activities requires a substantial amount of effort and the consideration of risks.

We need to be innovative in small steps. Successful experiences are probably the best way to demonstrate that data sharing among statistical authorities is the way forward. Being successful in change management requires sufficient resources and the necessary initial investments in technology, process improvements and methodology.

According to the Guide to Sharing Economic Data, international data exchange will only happen if statistical offices are open and willing to:

1. Amend legislation if needed.
2. Harmonize practices of statistical production with other producers of official statistics across the world.

3. Coordinate data analysis and exchange across statistical domains.
4. Adapt technical solutions with counterparts in data exchange.
5. Consult with respondents and other stakeholders.
6. Implement quality control measures and describe relevant quality observations with the metadata.
7. Incur costs, especially when launching or extending data sharing for statistical purposes.

It will be essential to build trust and enhance cooperation between national statistical offices and MNEs that provide the data that are crucial for the quality of economic and business statistics across countries. The legal framework enabling international data sharing for statistical purposes has been laid down in the Guidance on Modernizing Statistical Legislation [5]. The legal processes and consequences of data breaches should be defined internationally. To enable data sharing for statistical purposes with international organizations, the borders of the global statistical system will need to be defined.

International organizations are key players in promoting cultural change and providing discussion fora to share country experiences. These fora should bring together various statistical authorities in addition to national statistical offices, such as statistical units of central banks, ministries of finance and customs, to discuss and agree upon the practical needs for data sharing and to inform participants of successes and lessons learned.

It will be important to have a communication plan and a set of risk management tools available to ensure that the general public is well-informed of data sharing for statistical purposes and measures to safeguard privacy. The Guide to Sharing Economic Data provides common messages for the communication with MNEs, and further work should be undertaken to develop common tools for communication and risk management in data sharing.

The results of data sharing should be measured in quantitative terms to show the impact of shared data on the reconciliation of statistical asymmetries and the improved quality of statistics as a consequence. Furthermore, respondents' trust would be easier to achieve if statistical authorities could show a measured decrease in response burden and an increase in the quality of statistics as a result of data sharing for statistics.

Building trust calls for direct collaboration with MNEs. Any changes to the treatment of confidential data needs to be discussed openly and transparently, and be justified by reduced response burden, if expected, and better statistics for decision making.

It remains to be seen how these insights and lessons learned from recent innovations in data sharing will contribute to our collective understanding and help build the capability of the national and global statistical systems to make data sharing a regular part of the production of official statistics.

Acknowledgments

References

[1] Mezias, S.J., and Glynn, M.A. The three faces of corporate renewal: Institution, revolution, and evolution. Strategic Management Journal 14; 1993. 77–101.

[2] OECD. Oslo Manual 2018. Guidelines for Collecting, Reporting and Using Data on Innovation, 4th Edition; 2019. [Published on October 22, 2019. Paris, France].

[3] March, J.G. Exploration and exploitation in organizational learning. Organization Science 2; 1991. 71–87.

[4] Statistics Canada. Compendium of Management Practices for Statistical Organizations from Statistics Canada's International Statistical Fellowship Program. Chapter 4.5. Relations with survey respondents; 2016. Available from: https://www150.statcan.gc.ca/n1/pub/11-634-x/11-634-x2016001-eng.htm.

[5] UNECE. Guidance on Modernizing Statistical Legislation. United Nations. Geneva, Switzerland; 2018. Available from: http://www.unece.org/index.php?id=51141.